



*Pacific Gas and  
Electric Company®*

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# Electric Annex

## to the Company Emergency Response Plan (CERP)

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## Preface

This section contains Pacific Gas and Electric Company legal notices and trademarks, and provides information related to the ownership and maintenance of this document.

## Document Control

The Electric Emergency Management Department maintains this Electric Annex to the Company Emergency Response Plan. This section records the revisions made to the plan, and approval of the plan by the persons responsible for its preparation, maintenance, and update.

## Change Record

The following table is used to record all changes made to the plan. It describes the revisions made, the locations of the revisions, the names of the persons responsible for the revisions, and dates of revisions:

Revision	Sections Affected	Author	Date
1.0	Updated all sections and overall section arrangement. (E.g., added transmission, substation, job package, 911 standby, damage assessment, organization and responsibilities, etc.)	T3SN	7/24/2015
1.1	Updated fire prevention plan and minor edits throughout	T3SN, AMG2	8/28/2015
1.2	Full review and revision of the electric annex	S9SO	9/20/2017
1.3	Full review and revision of the electric annex, Removed the Fire Prevention Plan, updated Regional Directors to Regional Sr, Directors, corrected links within document.	Jo15	9/23/2019

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# 1 Introduction

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## 1.1 Purpose of Annex

The Electric Annex provides an outline of PG&E's electric emergency management organizational structure, roles and responsibilities, and describes the activities undertaken in response to electric emergency outage situations.

The Annex is a key element to ensure the company is prepared for emergencies to minimize damage and inconvenience to the public, which may occur because of:

- Electric system failures
- Major outages
- Hazards posed by damage to electric facilities

The Electric Annex's purpose is to serve as:

- The recovery and response plan to govern electric operations during emergency events
- A guide to develop an overall strategy for managing a response to specific disasters
- A tool to educate and train the Electric Emergency Management Organization (EMO) and key stakeholders on how to execute the plan
- The basis for developing annual drills and exercises to test the organization's ability to execute emergency response procedures
- The repository for capturing how continuous improvement efforts impact the Electric EMO emergency operations efforts

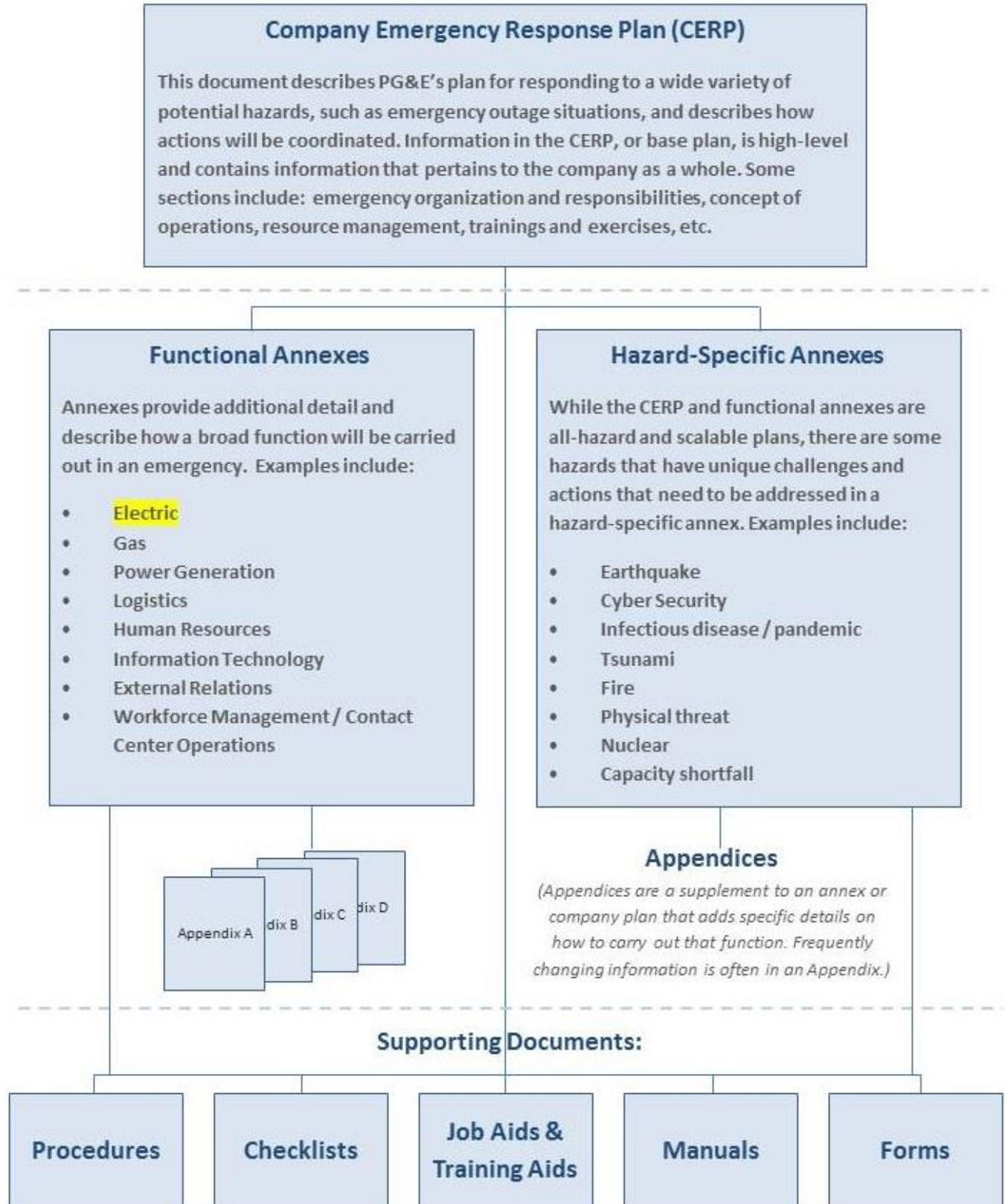
## 1.2 Scope

The scope of the Annex includes emergency response and restoration activities for electric distribution, transmission, and substation operations.

## 1.3 Electric Annex Overview

The Electric Annex is a functional annex to the Company Emergency Response Plan (CERP). Figure 1.1 below illustrates the relation between this Annex, the CERP, other annexes, and supporting documents. The following is not an all-inclusive list.

Figure 1.1 Electric Annex Relation to CERP and Supporting Documents



## 1.4 Regulations and Authorities

This Annex, as part of the CERP, complies with the regulations and authorities listed below.

### 1.4.1 Electric Distribution

CPUC General Order Number 166 (G.O. 166) helps ensure that electric utilities are prepared for emergencies and disasters to minimize damage and inconvenience to the public, which may occur because of electric system failures, major outages, or hazards posed by damage to electric distribution facilities.

Standard one of G.O. 166 states the utility shall prepare an emergency response plan setting forth anticipated responses to emergencies and major outages. It indicates the plan should help to ensure the utility is best able to protect life and property during an emergency or major outage and communicate the scope and expected duration of an outage. The required plan elements outlined in Standard one are included in PG&E's Company Emergency Response Plan (CERP) and Annexes.

### 1.4.2 Electric Transmission

- Federal Energy Regulatory Commission (FERC)
- North American Electric Reliability Corporation (NERC) Reliability Standards define the reliability requirements for planning and operating the North American bulk power system.
- Reliability Coordinator (RC)
- Western Electricity Coordinating Council (WECC)
- California Independent System Operator (CAISO) Standards for Reliability and Safety During Emergencies and Disasters (December 1997)

## 1.5 Role of Electric Emergency Management and Preparedness

Electric Operations Emergency Management (EM) strives to provide safe, efficient, and affordable electric service to our customers by rapidly supporting the recovery of our electric infrastructure and our communities.

To support the recovery of our communities, EM works with the lines of business and other leaders across Electric Operations to develop and recommend a strategic direction for electric emergency preparedness, emergency response and public partnerships. The team is involved in the implementation of emergency plans & processes, training, emergency exercises/drills, communication, and incident management. EM also serves as a liaison with public safety agencies during emergencies.

In addition, the team helps ensure compliance with company and regulatory safety policies and practices, as well as continually identify and promote continuous improvement opportunities.

## Electric Operations EM:

- Responds to emergency centers and supports electric emergency incidents
- Facilitates emergency response and business continuity planning; maintains related documents, such as the Electric Annex, Electric Emergency Plan for Capacity Emergencies, and business continuity plans
- Conducts trainings and exercises to ensure the readiness of Regional Emergency Center (REC) and Operations Emergency Center (OEC) personnel
- Conducts trainings and exercises on electric emergency plans
- Trains and coordinates emergency activities with public safety agencies
- Conducts performance monitoring of key operations and reliability metrics
- Submits plans and an annual filing to CPUC for G.O. 166
- Manages the Automated Roster Callout System (ARCOS), an automated callout and scheduling system that PG&E uses to assemble and track first responders and repair crews

More information about EM is available on the [EM website](#).

## 1.6 Annex Maintenance

### 1.6.1 Annex Development and Updates

The Emergency Preparedness and Response (EP&R) Department is responsible for developing, updating and maintaining the Company Emergency Response Plan (CERP).

The Electric Annex will be reviewed and revised, as necessary, on an annual basis and submitted to EP&R by September 30 each year. Electric Distribution Emergency Management will initiate the process, in collaboration with Electric Transmission, and will engage the support of departments with relevant responsibilities in this plan.

The Electric Annex may be modified because of:

- Lessons learned from exercises and actual incidents.
- Key changes to emergency response processes, structure, responsibilities, assessment/restoration strategies, etc.
- Feedback generated by PG&E subject matter experts, planning team, internal and external key stakeholders, and users of the annex.
- Changes to laws or regulations pertaining to electric operations emergency management.

Each revision of the annex will be approved by the Vice President of Electric Distribution Operations and the Vice President of Electric Transmission Operations. Records of revisions to the Electric Annex will be maintained in the change register at the beginning of this document.

Those departments having assigned responsibilities under this annex are obligated to inform Electric Distribution Emergency Management when organizational or operational changes affecting this plan occur or are imminent.

### 1.6.2 Annex Distribution

The Electric Annex is distributed to the Senior VP of Electric Operations and specific leadership positions in Electric Transmission, Electric Distribution and various support organization leaders. Copies are also provided to Emergency Center Commanders and their alternates and are stored in each emergency center location. This Annex is also available electronically in PG&E's Guidance Document Library and on the Emergency Management website under Emergency Plans.

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## 2 Emergency Organization and Responsibilities

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### 2.1 Emergency Facilities

#### 2.1.1 Electric Distribution Emergency Facilities

##### 2.1.1.1 District Storm Room (DSR)

The DSR responds to local and escalated emergency events and is generally located in a Service Planning and Maintenance yard. The main function of the DSR is to manage the local restoration effort during all levels of emergencies. The DSR is staffed with local support, such as troublemen, gas service reps, meter techs, estimators, mappers, service planning reps and construction crews. Clerical support inputs data into the Outage Management Tool (OMT) at this location. Information from assessment resources is added to the job packet and then handed off to construction crews for repairs to be performed. DSRs report to their division's OEC.

##### 2.1.1.2 Operations Emergency Center (OEC)

The OEC provides oversight and support at a divisional level. The OEC directs and coordinates the personnel necessary to assess damages, secure hazardous situations, restore service, and communicate status information internally and externally. OECs report to their Regional Emergency Centers.

##### 2.1.1.3 Regional Emergency Center (REC)

The REC provides oversight and support to the OEC(s) at a regional level. As an event escalates, the REC becomes the point of contact for information and managing escalated OEC(s) issues. When PG&E's Emergency Operations Center (EOC) is activated, the REC communicates operational status, resource requests, and logistical needs to the EOC.

##### 2.1.1.4 Central Electric Dispatch

Central Electric Dispatch is open 24/7, 365 days each year located in Fresno and is responsible for dispatching and scheduling Troublemens resources to outages, compliance equipment inspections, customer committed work, etc. Electric Dispatch also receives 911 stand-by requests from public agencies and dispatches Troublemens to respond as quickly as possible.

##### 2.1.1.5 Electric Distribution Control Centers

Electric Distribution Control Centers (DCCs) are located in Concord, Fresno and Rocklin where the real-time operation of the electric distribution grid is monitored and managed – this includes both planned and emergency outages. If an outage occurs, the Distribution Operator (DO) in the DCC helps to restore service to customers by directing field resources to operate distribution devices in the field and to substations to reconfigure or re-energize the distribution grid.

## 2.1.2 Electric Transmission and Substation Emergency Facilities

### 2.1.2.1 Electric Transmission Emergency Center (ETEC)

The ETEC is responsible for providing support to PG&E System Dispatch. ETEC's support includes: system restoration support, transmission outage prioritization in collaboration with California Independent System Operator (CAISO) and the EOC, as well as internal and external communications. For example, the ETEC maintains communication with the CAISO, Western Energy Coordinating Council (WECC), and other utilities involved in transmission system emergencies.

In addition, the ETEC serves as a hub coordinating support between Electric Operations, Transmission Line xx, Substation(s), News, other departments, and external entities.

In a Level 2 or greater emergency, the ETEC may be activated to assist System Dispatch with transmission related outages and to facilitate communications with the CAISO's Emergency Operations Center. The ETEC is also activated when the CAISO calls for load curtailments. In a level 3 or greater emergency where the EOC is activated, the ETEC reports to the Electric Transmission Branch in the EOC.

### 2.1.2.2 Grid Control Center (GCC)

Real-time operation of the PG&E Transmission System takes place at the GCC in Vacaville, and is staffed 24 hours per day, 365 days per year. The GCC is in daily contact with the CAISO to monitor power flows, receive clearance requests, and establish system restoration priorities, etc. The CAISO has overall operational control of our electric transmission facilities, as well as those of Southern California Edison, San Diego Gas & Electric, and others. The GCC deals with Level 1 and Level 2 emergencies involving electric transmission and is the designated PG&E single point of contact with CAISO.

### 2.1.2.3 Substation Transmission Operations Emergency Center (STOEC)

In a Level 2 or greater emergency, the STOEC coordinates damage assessment, information dissemination, and movement of Transmission Line and Substation manpower and equipment to assist operating departments in restoring service. The STOEC reports to ETEC and responds to the priorities and strategies set by the ETEC. Once activated, the STOEC tracks substation and transmission line (T-Line) resources and provides ETEC with restoration information and regular situational updates regarding quantity, type and location of resources within the T-Line organization. The STOEC also provides technical support to the field, when activated.

## 2.1.3 PG&E Emergency Centers

For details on all PG&E Emergency Centers and Support Centers, please refer to Emergency and Coordination Centers in the Company Emergency Response Plan (CERP).

## 2.2 Electric Distribution Emergency Roles and Responsibilities

This section includes information on Electric Distribution emergency roles and responsibilities. For the Incident Command System (ICS) positions that are used throughout all of PG&E's emergency centers, refer to the CERP Emergency Organization and Responsibilities Section.

### 2.2.1 Troublemakers (T-men)

T-Men are emergency response employees who usually work alone and whose primary responsibility is to assess an outage situation and identify basic cause, hazard considerations, and repair requirements, primarily on substation, circuit, and mainline outages. This individual can perform some repairs and/or correcting minor equipment failures. During the initial response, the T-man is the Incident Commander. T-men are QEW's.

### 2.2.2 Make Safe Crews

Make Safe crews focus on situations where hazardous conditions have been reported by customers, agencies, etc. and require prompt attention (i.e., wire down, cut in the clear). They are two-person crews consisting of linemen who are qualified electrical workers (QEW). Depending on their experience and training level, they have skill sets similar to Troublemakers and perform make safe activities and complete assessment assignments under the direction of the Dispatch Leader located in the OEC or DSR.

### 2.2.3 Assessment Crews and Rapid Assessment Strike Teams

Damage Assessment Crews are one or two-person crews with knowledge of electric field equipment. These crews often include gas service employees who are paired with electric estimators, compliance inspectors, or work and resource coordinators who are familiar with the territory. When there are a significant number of outages, damage assessment crews can be formed into Rapid Assessment Strike Teams.

The Rapid Assessment Strike Teams include estimators, an Associate Distribution Engineer (ADE), a supervisor, and support personnel. The strike teams are responsible for quickly patrolling damaged areas, conducting damage assessments, and relaying information to the Incoming Assessment Desk at the OEC or DSR. Rapid Assessment Strike Team members may also be assigned to the Incoming Assessment Desk to receive assessment information from the field and build job packets for the crews.

The Damage Assessment Crews are not considered "qualified electric workers"; they do not have equipment, switching skills, nor training to perform this type of work. These Assessment Crews/Strike Teams are used primarily to determine if the problem is located on PG&E equipment, assess the damage, and determine general magnitude of the repair. This assessment may include what equipment and resources may be required to repair the damage. An estimator is able to size equipment necessary for repairs. Assessment Crews may also serve as 911 standby until a qualified electric worker appears on site.

## 2.2.4 Incoming Assessment Desk Leader

The incoming assessment desk is where estimators receive incoming damage assessment information from the field and build job packages that are provided to the DSR for crew assignment. The Incoming Assessment Desk Leader oversees all personnel and staffing for the incoming assessment desk and prioritizes the creation of job packages at the OEC/DSR. The position is staffed by either an Electric Associate Distribution Engineer (ADE) or Estimating Supervisor and reports to the Operations Section Chief in the OEC.

## 2.2.5 Check In / Out Desk Recorder

The Check In / Out Recorders establish and manage the check in/out desk in each emergency center and base camp. They are responsible for ensuring that all personnel that come on site to support an incident are checked in each time they arrive and are checked out at the end of each work shift and at the end of their assignment. The Recorder reports to the Resource Unit Leader in the Planning and Intelligence Section in each emergency center.

## 2.2.6 Circuit-Based Branch Supervisor

Circuit-Based Branch Supervisors can be staffed by Distribution Supervisors, Estimating Supervisors, Mapping Supervisors, Operation Engineers, or Planning Engineers with operational knowledge who are trained to support a circuit-based assessment/restoration strategy. They provide direction to the Task Force Leaders, coordinate and prioritize work, establish communication between Task Force Leaders and the DSR to ensure situational awareness and safety, and participate with Planning and Intelligence (P&I) in the development of objectives for the action plan for the Circuit-Based Strategy. (Refer to 3.2.3.8.2 for details on circuit-based assessment/restoration.)

## 2.2.7 Standby Personnel

Standby personnel are responsible for cordoning off a hazardous condition and/or relieving a 911 agency until a qualified electric crew or T-man arrives to clear and/or repair the hazard. They are one or two-person crews with limited knowledge of field equipment, and often are staffed by meter readers, meter technicians, gas service representatives, gas construction workers, and various other employees. Standby crews generally do not have equipment switching skills, or the ability to estimate the magnitude of the repair and restoration timeframe.

## 2.2.8 Distribution System Operator

A Distribution System Operator (DO) is responsible for the operation of an assigned electric distribution jurisdiction. The DO directs and issues clearances, moves electric distribution load, and restores service when trouble occurs. DOs can open and close devices to reconfigure the circuit or restore customers using Supervisory Control and Data Acquisition (SCADA) enabled devices.

## 2.2.9 Electric Dispatcher

Electric Dispatchers are emergency response employees. They are responsible for dispatching all work to T-Men, including: outages, reliability-related tags, compliance inspections, customer-related work, and streetlights. They operate out of two separate dispatch systems: Ventyx and OIS.

## 2.3 Electric Transmission and Substation Emergency Roles and Responsibilities

### 2.3.1 Electric Transmission Branch Director

The ET Branch Director oversees ETEC, which provides system restoration support, transmission outage prioritization, block calculator support, study support for de-energization of equipment due to Public Safety Power Shutoff (PSPS) and internal and external communications. The ET Branch Director position is staffed by Directors or Senior Directors and reports to the Operations Section Chief in the EOC.

### 2.3.2 ETEC Lead

The ETEC Lead position is staffed by supervisors and managers in Electric Transmission Operations and reports to the ETEC Branch Director. They support System Dispatch with outage prioritization and serve as the liaison for System Dispatch during an event. The ETEC Lead is also responsible for providing direction to STOEC on outage priorities.

### 2.3.3 Transmission Troublemens

The description for a Transmission T-man is the same as an Electric Distribution T-man, as listed in Section 2.2.1.

### 2.3.4 Substation Maintenance Electricians

Substation Maintenance Electricians are emergency response employees who may work alone and whose primary responsibility is to assess the substation to identify basic cause, hazard considerations, and repair requirements. This individual can make some repairs and/or correcting minor equipment failures. They are QEW's.

## 2.3.5 Substation Teams Used in Level 5 Incidents

### 2.3.5.1 Substation Damage Assessment Teams

Substation Damage Assessment Teams are made up of two people (electrical and civil engineers, project managers or Maintenance Engineers) with knowledge of electric substation equipment. These teams consist of non-QEW personnel and are responsible for initial damage assessment inside substations.

### **2.3.5.2 Substation Make Safe Teams**

The Substation Make Safe Teams are made up of maintenance electricians and electrical inspectors and are QEW. Their primary function is to assess damage to substation equipment and to make safe, if necessary.

### **2.3.5.3 Substation Restoration Teams**

The Substation Restoration Teams are one to two-person teams that work with the transmission and distribution control centers to restore customers and transmission paths. These teams are made up of maintenance electricians / switching electricians and electrical technicians. They are qualified to perform substation switching and are under the jurisdiction of the GCC and/or the appropriate distribution control center.

### **2.3.5.4 Substation Repair Team**

The primary function of a Substation Repair Team is to repair or replace damaged substation equipment. These teams are made up of station construction, substation maintenance, Insulation and Coating, and test department employees.

### **2.3.5.5 Substation Standby Team**

The primary function of the Substation Standby Team is to stand by damaged equipment and facilities which may present a safety hazard to the public. In most cases, the fence surrounding a substation will keep the public away from substation hazards, but there may be cases where the fence is down or damaged. In these cases, standby teams are used to ensure public safety, and are comprised of Insulating and Coating and substation maintenance and construction personnel.

## 3 Concept of Operations

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### 3.1 Emergency Plan Activation

PG&E's Incident Levels are a useful decision support tool that helps support PG&E in understanding the complexity of an incident and the actions that may be employed at each level (e.g., emergency center activations, resources needed, etc.).

To ensure a consistent and well-coordinated response to emergencies, the company has adopted the following incident classification system:

- Level 1 – Routine
- Level 2 – Elevated
- Level 3 – Serious
- Level 4 – Severe
- Level 5 – Catastrophic

For additional details on PG&E's Incident Levels, refer to the Levels of Emergency Section in PG&E's CERP.

#### 3.1.1 Electric Activation Matrix

The Electric Incident Level Activation Matrix in Table 3.1 contains specific triggers that are used by the Emergency Center Commanders and the EOC On-Call to determine whether to activate the Electric Annex and which if any emergency centers will or should be activated. The Activation Matrix can be used following an event or in anticipation of an event. (For example, following a prediction of bad weather or during preparations for a Public Safety Power Shutoff (PSPS).)

The EOC On-Call and employees with an emergency response leadership role (Commanders, Operations, Planning & Intelligence, Logistics, Finance and Administration Section Chiefs, and the Public Information Officer) have the authority to call a meeting to review the activation matrix.

The EOC On-Call is notified of all Level 2 and above emergency center activations and can be reached at 8-223-9999 (internal) or (415) 973-9999 (external).



Table 3.1 Electric Incident Level Activation Matrix

Note that workload is the primary unit used to determine the need to escalate for Electric Distribution and # of outages/Area of Responsibility (AOR) for Electric Transmission. OEC activations may occur depending on incident complexity and the need to support customer communications, to mobilize resources, or to coordinate response. Refer to the [OEC Activation Guideline](#) for details.

Severity	Level	Expected Field Resources	Restoration Duration	EDO Workload <sup>1</sup>	Expected Customers Out (Electric) <sup>2</sup>	# ET Outages/AOR <sup>1</sup>	Load Shed - EEP	Actions	Emergency Centers	External Interest / Media / Reputation	Incident / Weather Examples
Routine	1	Tmen 44 Crews 25	<24 hours	Normal – 2X Workload (<130 SOs)	<20,000 Customers Out	<5	N/A	Local Resources Only	No activation	Routine local incident with no to little public or media interest.	Car pole, normal operations, light weather, virus detected or phishing directed at electric operations, single circuit outage
Elevated	2	Tmen 75 Crews 55	<24 hours typically, Could be up to 2 days	2X-4X workload (130 – 260 SOs)	>20,000 Customers Out	5-7	N/A	Resources mainly local, may need to move within Region	OEC or STOECC Communications Only; OEC and STOECC activation possible	Local emergency or customer issue with increased public, media, government, and/or regulatory interest.	Moderate heat or winter storm, wind--30-40 mph (EDO) or >35 mph (ET), wildland fire that results in de-energizing customers and minor damage to infrastructure, cyber incident - virus detected on DMS or EMS system, loss of 3 or more substations' visibility in SCADA
Serious	3	Tmen 120 Crews 100	1-3 days	4X – 10X workload (261 – 650 SOs)	>100,000 Customers Out	7-10	Localized	Resources move within Region, may need to move between regions	OEC or STOECC activation; REC, ETEC, and EOC activation possible	Local/Regional emergency or customer issue with increased public, media, government and/or regulatory interest. Potential reputational risk.	Significant heat or winter storm, wind– 35-50mph (EDO) or >50mph (ET), significant earthquake <sup>3</sup> , wildland fire that results in de-energizing customers and significant damage to infrastructure, cyber incident - malware affecting SCADA, EMS, DMS systems, ET: total loss of EMS or SCADA, loss of 500kV or 230kV substation
Severe	4	Tmen 220 Crews 170	2-6 days	10X – 32X workload (651 – 2080 SOs)	>300,000 Customers Out	10-14	Localized/ Regional	Resources move between Regions, contractors, may require Mutual Aid	OEC, REC, STOECC, ETEC and EOC activation	Severe emergency or customer issue with considerable public, media, regulatory and government interest across multiple regions, and at the state and national level. Potential reputational risk.	Major heat or winter storm, wind– 40-60mph (EDO) or >60mph (ET), significant earthquake, wildland fire that results in de-energizing customers and major damage to infrastructure, fire affecting major paths, cyber incident - slow system response times, limited awareness at grid control
Catastrophic	5	Tmen 710 Crews 560	>6 days	>32X workload (>2080 SOs)	>750,000 Customers Out	>14	System wide	Mutual Aid	OEC, REC, STOECC, ETEC, EOC and IST activation	Catastrophic emergency or customer issue with extensive public, media, gov't, and regulatory interest across multiple regions and at the state, national and international level. Potential reputational risk.	Major to catastrophic storm event, wind-- 60+ (EDO) or >75mph (ET), significant earthquake, firestorm with catastrophic impact to infrastructure, cyber incident - control of grid assets by foreign group

<sup>1</sup> Workload is the primary unit used to determine the need to escalate and is based on the number of unplanned sustained outages (SOs) for Electric Distribution Operations (EDO) and # outages/Area of Responsibility (AOR) for Electric Transmission (ET).

<sup>2</sup> Customer counts are a SOPP output based on workload

<sup>3</sup> Geosciences recommended the qualitative description of "significant earthquake" rather than listing a specific magnitude for Levels 3-5



## 3.1.2 Activation Process and the Authority to Activate

### 3.1.2.1 OEC, REC and EOC

The Emergency Center Commanders and the EOC On-Call utilize the Electric Incident Level Activation Matrix in Table 3.1 and the OEC Activation Guidelines to determine whether to activate the Electric Annex, and at what level to activate. While the EOC On-Call can conduct an initial assessment and recommend the activation of a plan/facility to the appropriate Emergency Center Commander, the decision to activate an emergency center is at the discretion of the Emergency Center Commander and is based on the complexity of the incident.

A Level 1 emergency requires no special trigger and is managed locally following existing procedures. In an escalating event, or if a division's outage thresholds are met, Central Electric Dispatch or the On-Call Supervisor notifies the On-Call OEC Commander about the nature of the event and the potential need to activate the OEC.

Using the activation matrix above, the Storm Outage Prediction Project (SOPP) Model predictions, and the [OEC Activation Requirements](#), the On-Call OEC Commander (field operations Superintendent) may authorize activation of an OEC for reasons including, but not limited to, the following:

- A Level 2 or greater emergency
- A division exceeds their division's outage threshold, and field resources (e.g. Troublemakers and crews) are not readily available.
- A division's SOPP Model Forecast predicts inclement weather at Level 2 or above, which may result in a proactive activation
- At the direction of the regional Field Operations Director
- At the request of the Electric Operations Director, Control Center Supervisor, Electric Dispatch Shift Supervisor, EOC On-Call, EOC Commander, or Field Operations On-Call Supervisor

The REC Commander may authorize activation of an REC for reasons including, but not limited to, the following:

- A Level 3 or greater emergency
- A Region's SOPP Model Forecast predicts inclement weather at Level 3 or above, which may result in a proactive activation
- Multiple OECs are activated
- At the request of the OEC Commander, EOC Commander, or EOC On-Call

The EOC Commander may authorize activation of the EOC and needed support centers for reasons including, but not limited to, the following:

- A Level 3 or greater emergency
- Multiple REC's are activated

- At the request of the EOC On-Call or REC Commander
- Response to the emergency would be better served by managing resources and operations centrally
- Prioritization for the use of resources across regions is necessary

In addition to the EOC Commander, the Senior Vice President of Electric Operations has pre-designated the following personnel to activate the EOC: Vice President of Electric Distribution Operations, Vice President of EP&O, Director of Electric Operations Emergency Management, Director of Restoration Field Operations, Director of System Operations and Control, and the Director of EP&R. The Vice President of Electric Operations delegates to Electric Distribution and Electric Transmission Officers and Directors the responsibility for managing emergencies within their assigned areas of responsibilities.

Personnel with the authority to activate the EOC also have the authority to determine if the EOC will activate in the primary facility in San Francisco, the alternate facility in San Ramon, the secondary alternate facility in Vacaville, virtually through Internet and telephone, or at some other location.

Refer to Appendix C for the Emergency Center Activation Checklists.

### 3.1.2.2 Electric Transmission Emergency Center (ETEC) and Substation Transmission Operations Center (STOEC)

The Electric Transmission Branch Director and the STOEC IC use the Electric Incident Level Activation Matrix in Table 3.1 as a guideline to determine whether to activate the Electric Annex, and at what level to activate. The ETEC is activated due to a system emergency, at the request of the EOC, System Dispatch, or the ET Branch Director. The STOEC IC can also determine whether to activate the STOEC.

## 3.1.3 Notifications

### 3.1.3.1 Internal

The Emergency Center Commander, or designee, ensures:

- On-call personnel are notified about the emergency and reporting information according to that emergency center's call-out procedure
- Emergency center email distribution lists and paging lists are used to inform key stakeholders
- The activation status is updated in the Outage Management Tool (OMT)

Additional notifications are made when the following emergency centers are activated:

- OEC/REC: EOC On-Call is notified.
- EOC for an electric operations response: EOC Commander notifies the Director of Emergency Preparedness and Response (EP&R).

- ETEC: ETEC staff notifies the EOC On Call and Routing Team. (Refer to the ETEC Activation Quick Start Guideline for notification details.)
- STOE: The Electric Distribution Emergency Management Director, ETEC Lead, and GCC are notified.

### 3.1.3.2 External

In compliance with Standard Six of G.O. 166, within one hour of the identification of a major outage or other newsworthy event, PG&E notifies the CPUC and the Warning Center at California Office of Emergency Services (Cal OES) of the location, possible cause, and expected duration of the outage. PG&E generally treats “newsworthy events” as incidents within the category of Level 3 or greater emergency, where the EOC is activated. (Refer to Section 4.2.4 for additional details on major outage reporting.)

When ETEC is activated, the supervising system dispatcher notifies the CAISO.

## 3.2 Emergency Response Process

### 3.2.1 Readiness

#### 3.2.1.1 Readiness Expectations

All employees involved with emergency response will be oriented to the Electric Annex, applicable department emergency plans, and their respective emergency centers’ contact list. The following sections provide guidelines to prepare for an emergency event.

Refer to the [Emergency Management Website](#) for additional information on Electric EMO staffing plans, contact lists, training, job aids and processes. Refer to [SharePoint](#) for additional Transmission Operations contact lists.

#### 3.2.1.2 Primary and Alternate Positions

Designated positions for emergency response activities are to be at a minimum three deep at the EOC, REC, and OEC level. All other centers are also expected to maintain three deep staffing rotations. It is recommended to go four deep in all roles, if possible. The alternates must be qualified to assume the designated roles and responsibilities. Staffing plans and contact lists must be reviewed and updated regularly to account for organizational changes within the Electric EMO.

#### 3.2.1.3 Call-Out Procedures

Each emergency center will maintain an emergency staffing plan and execute the call-out procedure to ensure adequate staffing levels for every emergency. For EOC personnel, the Director of Emergency Preparedness and Response maintains a roster for a Level 3 and above response, with appropriate contact information. When warranted by the magnitude of a significant emergency (e.g., earthquake), all levels of the Electric EMO are expected to report immediately for emergency assignment. The on-call staffing plans are located in ARCOS Crew Manager. Epage is used to call in OEC staff when an OEC is activated.

PG&E will adhere to International Brotherhood of Electrical Workers (IBEW) and Engineers and Scientist of California (ESC) Company union agreements regarding call-out of bargaining unit classifications for augmentation of resources.

Refer to 3.2.4.10 for more information on ARCOS (Automated Roster Callout System), an automated callout and scheduling system that PG&E uses to assemble and track first responders and repair crews in response to electric emergency outage situations / unplanned events.

### 3.2.1.4 Emergency Center On-Call Responsibilities

A staffing plan and/or contact list will identify on-call individuals for each emergency center. The on-call responsibilities include the following:

- Ensure availability during defined schedule.
- Maintain a heightened level of awareness of all potential, forecasted, and in-process emergency events.
- Be knowledgeable of the triggers and activities of the respective emergency coordination center or department for each emergency level.

## 3.2.2 Pre-Event

### 3.2.2.1 Pre-Event Preparation – Summary

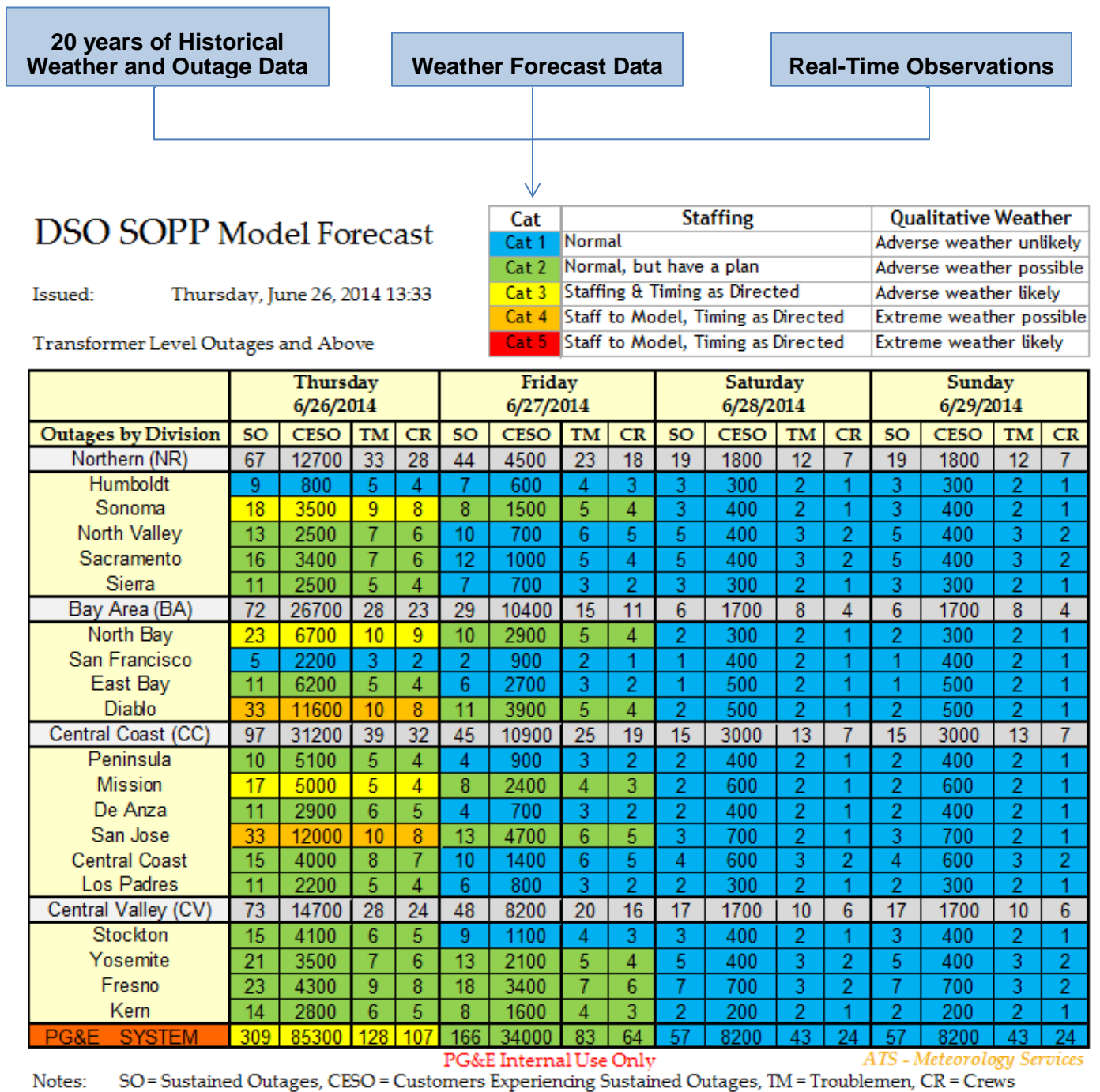
Pre-event preparations shall be incorporated into the emergency response and restoration operations at every level of the Electric EMO. Appropriate pro-active measures shall be taken when identified triggers have been met at the direction of the EOC Commander. The Distribution System Operations Storm Outage Prediction Project (DSO SOPP), and TD 1464S (Fire Danger Precautions and Fire Index) are intended to assist the Electric EMO with weather prediction, outage prediction, resource guidelines, and fire awareness.

### 3.2.2.2 Hazard Forecasting and Prediction

#### 3.2.2.2.1 Damage Modeling and Storm Outage Prediction Project (SOPP) Model

The Distribution and Transmission System Operations Storm Outage Prediction Project (DSO SOPP and T-SOPP) model was developed to link adverse weather conditions to outage and resource needs. The model combines historical weather and outage data with weather forecasts to predict the number of transformer level and above Sustained Outages (SOs) per division for each of the next four days. The model also provides an estimate of the resources needed to respond to the level of predicted outages. The primary adverse weather threats modeled are wind, rain, low snow, and heat. SOPP model outage forecasts are assigned a category level 1, 2, 3, 4 or 5 based on how the predicted level of SOs compares with long-term historical level of SOs for each specific Division or Area. The model provides specific quantitative forecasts for SOs, customer counts, and resource requirements. An example forecast, as well as a qualitative description of the categories is presented in the tables below.

Figure 3.1 DSO and TSOPP Model Forecasts



## DSO SOPP Model Forecast Timing, by Division

	Thursday 6/26/2014	Friday 6/27/2014	Saturday 6/28/2014	Sunday 6/29/2014
Timing by Division	Timing	Timing	Timing	Timing
Humboldt				
Sonoma	16:00 - 20:00	16:00 - 20:00		
North Valley	16:00 - 20:00			
Sacramento	16:00 - 20:00			
Sierra	16:00 - 20:00			
North Bay	16:00 - 20:00	16:00 - 20:00		
San Francisco				
East Bay	16:00 - 20:00			
Diablo	16:00 - 20:00	16:00 - 20:00		
Peninsula	16:00 - 20:00			
Mission	16:00 - 20:00	16:00 - 20:00		
De Anza	16:00 - 20:00			
San Jose	16:00 - 20:00	16:00 - 20:00		
Central Coast	16:00 - 20:00			
Los Padres	16:00 - 20:00			
Stockton	16:00 - 20:00			
Yosemite	16:00 - 20:00	16:00 - 20:00		
Fresno	16:00 - 20:00	16:00 - 20:00		
Kern	16:00 - 20:00	16:00 - 20:00		

PG&amp;E Internal Use Only

ATS - Meteorology Services

Note: Timing reflects the most intense period of outage producing weather for any division at Cat 2 or above



**Restricted to PG&E Transmission Function Employees - Do Not Distribute**

# Transmission SOPP

*Model Forecast*

Forecast Issued: Wed

Cat	Qualitative Weather
Cat 1	Significant adverse weather outages unlikely
Cat 2	Adverse weather outages possible
Cat 3	Adverse weather outages likely
Cat 4	Significant adverse weather outages likely
Cat 5	Extreme adverse weather outages likely

System Risk	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed
Outage Forecast & Total Risk	5 - 11	37 - 58	4 - 9	0 - 2	0 - 2	1 - 5	1 - 5	1 - 5
Outage Risks by Weather Type								
South Wind								
North East Wind								
North West Wind								
Heat								
Low Snow								
Lightning								
Heavy Rain								
Flashover								

Area Forecast	Wed	Thu	Fri	Sat
Area 1	0 - 1	2 - 4	0 - 1	0 - 1
Area 2	0 - 1	1 - 3	0 - 1	0 - 1
Area 3	0 - 1	5 - 10	0 - 1	0 - 1
Area 4	0 - 1	6 - 12	3 - 5	0 - 1
Area 5	0 - 1	2 - 4	0 - 1	0 - 1
Area 6	0 - 1	7 - 11	0 - 1	0 - 1
Area 7	2 - 5	9 - 16	0 - 2	0 - 2

*ATS - Meteorology Services*

Area Timing	Wed	Thu	Fri	Sat
Area 1		02:00 - 14:00		
Area 2		02:00 - 14:00		
Area 3		02:00 - 14:00		
Area 4		10:00 - 24:00		
Area 5		06:00 - 24:00		
Area 6		00:00 - 18:00		
Area 7	14:00 - 24:00	00:00 - 16:00		

Note: Timing reflects the most intense period of outage producing weather per Transmission Area

### 3.2.2.2.2 Severe Weather Notifications

- Weather Warnings will be issued for any division where there is an imminent threat of severe weather within the next 12 hours unless the imminent threat was already anticipated and/or communicated through the regular DSO SOPP Model dissemination.
- Thunderstorm Warnings are a special case and will be issued for any division where there is an imminent threat of lightning within the next 12 hours, regardless of whether this threat was anticipated or communicated in the regular DSO SOPP Model dissemination.

### 3.2.2.2.3 Plans (e.g., Fire Prevention Plan, Fire Index, and TD-1464S, PSPS)

#### PG&E Fire Prevention Plan

PG&E's Fire Prevention Plan reflects PG&E's policy on fire prevention pre-planning, threat mitigation, and fire readiness and response. The plan also outlines the actions that PG&E takes to prevent and mitigate the risk of fire ignitions associated with the operation of overhead electric power facilities.

In addition to the fire prevention and mitigation measures for the entire service territory, the plan also includes an Addendum A, "Special Fire Threat Zones: Santa Barbara County" (which discusses PG&E's plan for additional fire mitigation measures to be taken specifically in Santa Barbara County, a high fire threat area). The Fire Prevention Plan can be located in the Guidance Document Library.

#### PG&E Fire Index

The PG&E Meteorology unit operates a high-resolution weather and fire danger coupled model, POMMS-NFDRS (PG&E Operational Mesoscale Modeling System – National Fire Danger Rating System), which outputs granular (2 km) fire weather and danger parameters. Model outputs are leveraged to produce fire-danger ratings from R1 to R5 for each Fire Index Area within the Company service territory. Fire Weather Watches and Red Flag Warnings issued by the National Weather Service are also incorporated as "R4" and "R5" fire danger, respectively, in the model.

The fire danger rating is a prediction of the most severe rating expected for each area from midnight to midnight. This information is posted and updated daily on the Company Intranet at the [Fire Adjective Index](#) website.

The fire adjective index site allows users to filter the information by Grid Control Center area, Distribution control center area, or fire index area. The data file is checked and verified by the Grid Control Center by 0230 hours each day and is posted by 0400 hours each day. Intraday updates are rare but may occur if fire danger conditions or other circumstances warrant. Meteorology Services distributes the information via email in its Distribution System Operations Weather Forecast each morning. The information is also covered in the Electric Distribution Operations Daily Status Call.



### Utility Standard: Fire Danger Precautions in Hazardous Fire Areas (TD-1464S)

TD-1464S is a standard issued by PG&E providing all employees precautionary information when working, traveling, or operating in hazardous fire areas. This document contains specific precautions to be taken by employees and supervisors while in the Fire Danger zones.

TD-1464S states that employees must adhere to specific requirements when operating in “R4” and “R5” zone ratings. Automatic notification via e-mail and e-page has been made available for all PG&E employees to enhance fire danger awareness.

### Public Safety Power Shutoff (PSPS)

The Public Safety Power Shutoff (PSPS) Annex provides a process overview for implementing a PSPS. Given the continued and growing threat of extreme weather and wildfires, and as an additional precautionary measure following the 2017 and 2018 wildfires, PG&E developed its PSPS program in 2018. A PSPS is a proactive de-energization of PG&E equipment as a measure of last resort to reduce wildfire risk. A PSPS will only be done when gusty winds and dry conditions, combined with a heightened fire risk, are forecasted to threaten a portion of PG&E’s electric system.

PG&E’s PSPS program includes all electric lines that pass through high fire-threat areas — both Distribution and Transmission. While customers in high fire-threat areas are more likely to be affected, any of PG&E’s more than 5 million electric customers could have their power shut off if their community relies upon a line that passes through a high fire-threat area. The most likely electric lines to be considered for shutting off for safety will be those that pass through areas that have been designated by the California Public Utilities Commission (CPUC) as at elevated (Tier 2) or extreme (Tier 3) risk for wildfire.

#### 3.2.2.2.4 Non-Weather Related Warnings

Non-weather-related warnings may be obtained from several sources, including operations reports covering load status and alerts from the state or local Office of Emergency Services (OES).

#### 3.2.2.3 Pre-Event Notification

Upon receipt of a weather warning, weather watch, weather advisory, or non-weather-related warning, each level of the Electric Operations (EO) EMO will ensure that pre-designated personnel are advised and that appropriate pre-event actions are taken. This may include placing personnel on alert status; advising employees to pack overnight bags in advance; reviewing emergency plans; identifying key personnel available for restoration activities; pre-staging personnel; evaluating supplies and equipment; and canceling non-critical meetings. If warranted, affected emergency centers may be activated in anticipation of an event occurrence.

### 3.2.2.4 Briefings and Conference Calls

Regional Sr. Directors (REC Commander), Superintendents (OEC Commander), and Construction Supervisors (Branch Directors) will be coordinating and conducting pre-event conference calls within their regions to discuss activation, staffing, materials, pre-staging, and pre-arranged overtime (POT) resources.

Upon receipt of a significantly adverse weather forecast (i.e., Cat 4 or 5), the Director of Emergency Management will arrange for a briefing to be conducted for Electric Operations Officers, Sr. Directors, and key emergency response personnel to discuss the situation and to identify pre-event actions to be implemented.

### 3.2.2.5 Available and Pre-Arranged Resources

When forecasted conditions warrant, the EOC Commander may request that RECs, OECs and DSRs submit plans in advance of the event for the number and classification of personnel who will be available to respond. These counts are often requested two to three days in advance of a forecasted event and updated daily until the event occurs. Available resources include all personnel who are available to respond, including personnel scheduled for normal shifts, those pre-arranged or held-over, and those signed up for the 212 call-out list. Depending on the event, pre-arranged resources (either crews on shift or those held over) can be expected to meet the minimum staffing levels as identified in the DSO SOPP model. In this case, 212 call-out lists provide supplemental personnel should they be needed.

### 3.2.2.6 Pre-Staging Resources

When indicated by the nature and severity of the pre-event forecast, the EOC Commander may direct pre-staging of crews, personnel and/or certain equipment in areas expected to be severely impacted. Electric Operations Officers will be advised of all pre-event actions to be implemented. REC Commanders, OEC Commanders, with support from their respective logistics sections, may also activate local staging areas.

As necessary, EOC Logistics will work with the Material and Transportation Coordination Center (MTCC) to support resource requirements including pre-arranging personnel at the distribution centers, specialty stores and service centers, as well as verifying service center inventory stocking levels are adequate to support the event.

## 3.2.3 Assessment, Restoration and 911 Emergency Response

### 3.2.3.1 Prioritization Guidelines

A system-wide disturbance has significant differences from a localized event, which results in two prioritization guidelines for a system-wide disturbance versus individual outages, as listed below. The priorities below may change depending on the complexity of the incident.

#### 3.2.3.1.1 System-wide Electrical Disturbance

Assessment and restoration priorities are as follows (in order of prioritization from highest to lowest, but note some of the following may be executed simultaneously):

- Safety
- Diablo Canyon Power Plant
- Other major generating stations
- Transmission system backbone
- Control area interconnections (500 KV) – Per Western Electricity Coordinating Council (WECC) Interconnection Disturbance Assessment and Restoration Guidelines: “The strongest ties reconnecting the islands should be closed first to prevent further tripping of weak ties. Generally, this means that 500 KV ties in the major loop (Pacific Northwest-California) must be restored before lower voltage ties.”
- Substation
- Local Transmission
- Distribution circuit breakers and recloser/interrupter zones
- Distribution sectionalizer/fuse zones
- Distribution transformers and individual services

Consideration should be given to requests for priority restoration of customers such as individuals on life support, hospitals, fire departments, police stations, critical communications centers, emergency shelters, sewage treatment plants, and critical water pumping stations. During emergency events, it is imperative that all levels of the organization coordinate its efforts with local and state governments.

#### 3.2.3.1.2 Transmission and Distribution Outages

The following priorities are applicable for any unplanned transmission outages:

- Safety
- Potential equipment overload
- Generation
- Source outage time (More than 24 hours)
- Customers (number) impacted and length of outage
- Load (MW) impacted
- Customers (number) at risk for additional outage(s)
- Load (MW) at risk for additional outage(s)

#### 3.2.3.2 Response and Restoration Criteria

Utilizing available information and sound judgment, the emergency centers will allocate resources to support established restoration criteria and priorities. Restoration priorities are to be re-evaluated throughout the event to ensure optimum allocation and deployment of resources. Response and restoration criteria have been established, which are based on the following priorities:

- Make Safe - respond and make safe for the public and PG&E personnel.
- Assess - assess outages and damages.
- Communicate – communicate timely and accurately, both internally and externally.
- Restore – balance the need to provide service to the greatest number of customers in the least amount of time with the need to restore service to small numbers of customers out of power for long durations.

Following an event at any level, PG&E's first priority is to "make safe," including protecting health and property. The "PG&E Emergency Response Objectives / Priorities" stated in the Company Emergency Response Plan (CERP) are maintained through all phases of response to an emergency.

In larger emergencies when resources are constrained, it may be necessary to establish work priorities for restoration of service. These priorities are operationally-driven and are primarily focused on restoring as many customers as soon as possible. Priorities may need to be modified, however, to accommodate the needs of the communities we serve. Work may also need to be coordinated with other infrastructure repairs that may be occurring simultaneously by other utilities, government, and property owners. The Emergency Operations Center (EOC) will manage priority/objective-setting in a coordinated manner whenever possible, working with local government and other impacted utilities.

The Incident Action Plan (IAP) documents in a written plan these incident objectives and reflects the tactics necessary to manage an incident during an operational period<sup>1</sup>. Changes to an incident's objectives/priorities are reflected in updates to the IAP.

PG&E maintains lists of Essential and Critical Customers. Essential customers require electric service to provide essential public health and safety services or meet other criteria set by the California Public Utility Commission (CPUC). To be classified as Essential, a customer must apply to PG&E for this designation. Critical customers are high-impact (in terms of revenue, data, potential for physical damage, etc.) or high-profile (e.g., tourist attractions, arenas, and major community, town, or city facilities). Customers apply to PG&E to be placed on the critical customer list. This designation is determined solely by PG&E and is internal only.

Both essential and critical customers are highlighted in the Outage Management Tool (OMT) reports, and their status and restoration can be tracked by the OEC/REC/EOC, customer relationship managers, and other company personnel.

### 3.2.3.3 Outage Duration Guidelines

Outage duration will be considered when prioritizing outages. The objective is to ensure that ALL customers are addressed within the first 24 hours of the beginning of their outage. The Electric EMO leadership (e.g., EOC, REC, OEC Commander) will continually monitor

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<sup>1</sup> An operational period is the period scheduled for executing a given set of actions in the IAP. (For example, the length of the operational period may be 12 hours at the start of the incident and adjusted over time, as operations require.)

the event and the affected outages of extended duration. At a certain point during the event, based on the EMO leadership's judgment, dedicated resources will be assigned to extended duration multiple or single customer outages.

The Electric EMO leadership will:

- Define the number of assessment crews that will be dedicated to single customer outages and extended duration outages (i.e. 1-T-man and 2-Make Safe).
- Define the number of repair crews that will be dedicated to single customer outages and extended duration outages (i.e. 2-Headquarter Crews).
- Engage Customer Strategy to ensure appropriate Interactive Voice Response (IVR), Media and Contact Center messaging is accurate and timely.

### 3.2.3.4 Coordination Between Transmission, Distribution and Substation

#### 3.2.3.4.1 Level 1 Coordination

##### Sustained Transmission-Level Outages

If there is a sustained transmission level outage, the GCC will coordinate with T-line, Substation, Distribution, System Protection, and Transmission Operations Engineering to come up with a comprehensive plan on how to assess and restore the system (e.g., Distribution back ties, alternate transmission sources, generator, etc.).

Below are the responsibilities by line of business:

- GCC—initiates call out for evaluation of incident, notifies internal and external stakeholders, initiates IC call, as needed, determines personnel requirements for restoration strategies
- Tline—patrols line for cause
- Substation—status and assesses substation
- System protection—provides fault location and relay information
- Transmission Operations Engineering—evaluates current system conditions for additional system reliability issues and restoration strategies
- Distribution—if transmission source to distribution remains out of service for greater than five minutes, distribution will immediately start working on back ties for customer restoration, if available. Distribution will also coordinate with the Customer Care Organization for customer communications and manage ETORs.

##### Sustained Distribution-Level Outages

Electric Distribution may initiate an IC call during Level 1 operations with a focus on the restoration of customers, the identification of the fault location, and materials and resources needed for repair if there is a sustained distribution-level outage that includes one or more of the following:

- Large mainline outages over 1000 customers
- Large media event—brand-level impact, Electric Reporting Criteria
- Sensitive or commercial customers
- Distribution feeder integrity—deliberate load shedding due to system conditions
- Load at risk—high customer impact for emergency repairs

Key participants in the IC call include:

- Field Operations Superintendent as IC to support mobilization of repair crews
- Restoration Manager, or designee

- Corporate Communications representative to support information through media channels
- ES&S to support communication to critical and essential customers
- Government Relations for communication to our public partners
- Other stakeholders, such as Transmission and Substation leadership, may participate to support engagement from their respective organizations, depending on incident complexity

#### 3.2.3.4.2 Level 2 or Above Coordination

In localized events where an OEC and STOEC are activated, the OEC works directly with STOEC to coordinate actions. When the REC and ETEC are activated, the OEC and STOEC summarize their actions to ETEC and the REC.

When the STOEC/ETEC is activated, ETEC provides STOEC with the priorities. STOEC then initiates a situation call with the GCC, STOEC Operations Section Chief, STOEC Planning and Intelligence Section Chief, and the OEC Commander to develop the operational period objectives and implementation plan. Next, STOEC initiates an IC call to communicate the plan to needed stakeholders.

Depending on incident complexity when there are both transmission and distribution outages, Electric Transmission may be included as a Transmission Operations Section Chief in an OEC's Incident Management Team (IMT). This Transmission Operations Chief helps serve as a key liaison between STOEC and Electric Distribution, which results in improved coordination and assessment/restoration time.

During more complex events where there is a significant number of outages or damage, the OEC Commander, in collaboration with the Operations Section Chief, may designate Transmission, Distribution and Substation Branches in the Operations Section to more effectively manage the response.

### 3.2.3.5 Damage Assessment

#### 3.2.3.5.1 Assessment Goals and Guidelines

The guidelines and goals of Assessment Teams will be consistent with the restoration criteria and prioritization guidelines. Within those guidelines, the following will be considered:

- Safety
- Hazards
- Customer count
- Outage duration
- Crew type and availability
- Current crew activity



- Efficient routing of crews
- Other priority considerations identified by external sources (i.e. critical customers, requirements of government agencies)
- Weather conditions

### 3.2.3.5.2 Assessment Functions

There are two key functions to the assessment process

- Field personnel initially assess the damage and make repairs if possible.
- Office personnel manage the information using OMT to ensure the assessment information is timely and accurate throughout the restoration process. By ensuring accurate information, the customer will receive quality information.

As a general guideline, Troublemens (T-men) and Make Safe Crews should attempt to restore power if the repair can be conducted within one hour of determining the problem. This guideline excludes sectionalizing, as directed by the distribution control centers, or to make the location safe.

### 3.2.3.5.3 Catastrophic Event Electric Damage Model (EDM)

A significant aspect of emergency planning and response involves the use of damage modeling information to estimate the impacts of earthquakes and the electric assessment and repair resources needed. The EDM provides information that helps understand potential damages to the Electric Distribution system and which substations to inspect. Using the USGS ShakeMap, asset data, and models describing how assets perform during earthquakes, EDM computes the potential damages and number and type of emergency resources needed to restore electric service.

### 3.2.3.5.4 Transmission Assessment Process

During Level 1 incidents, the GCC contacts a Transmission T-man to respond, as well as system protection to provide the fault location information. The Transmission T-man goes to the fault location, conducts an assessment, and reports back to the GCC. If there is a repair location, they report their findings to the GCC and the T-line Supervisor. The T-line Supervisor then determines the resources needed and implements a callout for crew assembly.

During STOEC / ETEC activations, the ETEC Lead works with the GCC to prioritize the order in which the assessment takes place. The ETEC Lead then provides direction to the STOEC IC, so they can prioritize resources for dispatch to execute the assessment plan.

In the event of an earthquake, based on the damage model and epicenter of the earthquake, the STOEC Planning and Intelligence Section Chief will work with the Operations Section Chief to create an inspection list for transmission lines in the area. (For details, refer to TD-1910P-01 Inspecting Electric Underground Transmission Lines After a Major Earthquake.)



### 3.2.3.5.5 Substation Assessment Process

During Level 1 incidents, the GCC or DCC contacts an electrician to respond, as well as system protection to provide the fault location information. The electrician statuses the substation, assesses any substation trouble, and reports their findings to the GCC or DCC and the Substation Supervisor. The Substation Supervisor then determines the resources needed and implements a callout for crew assembly.

During STOEC / ETEC activations, the ETEC Lead works with the GCC to prioritize the order in which the assessment takes place. The ETEC Lead then provides direction to the STOEC IC so they can prioritize resources for dispatch to execute the assessment plan.

System Protection supports all outages and protection questions, and provides an on-call Protection Engineer, whenever assistance is needed. For smaller issues, the GCC or DCC directly calls the Protection Engineers that support the area.

#### Earthquake

The electric damage model provides a list of substations to conduct the initial assessment. Upon receipt of the damage model, the ETEC Lead follows the same process listed above for creating an assessment plan during a STOEC/ETEC activation.

The ETEC Lead determines the resource needs required to accomplish the Operational Period Objectives. The Lead sends the request for which Substation Teams (Assessment, Make Safe, Repair and Standby) to use for the event, and the teams are dispatched and managed under the STOEC Operations Section Chief. The Substation Restoration Teams are under the jurisdiction of the control centers and are dispatched by the GCC or appropriate DCC.

In the event of an earthquake where communications are down, substation maintenance electricians report to their pre-assigned substations. Substation maintenance electricians assist in the assessment of substation damage and receive direction / assignments through STOEC. The Substation personnel use the Substation Rapid Assessment Form to complete an initial inspection of substation facilities (equipment and buildings). They then report their findings to STOEC and the local control centers, as appropriate.

Pre-assigned structural engineer contract inspectors are automatically dispatched by the Facilities Coordination Center (FCC) to perform damage assessments of important indoor substation buildings. Requests for assessment of other substation buildings are directed to the FCC.

SM&C personnel may perform Initial Damage Evaluation of substation buildings (TD-3350P-17). At the direction of STOEC, Substation Engineering Services (SES) civil engineers may assist SM&C in the assessment of damage to equipment, structures, buildings, and other site facilities. SES Engineers are not qualified electrical workers (QEW), but several are trained and certified in post-earthquake damage assessment of buildings.

### 3.2.3.5.6 Distribution Assessment Process

The assessment process begins with Central Electric Dispatch in Fresno, which handles dispatching all electric work to Troublemakers (T-men). Troublemakers then assess the outage situation and use the FAS units in their vehicles to update information in OMT. In the event the circuit has Fault Location Isolation and Service Restoration (FLISR) technology installed and enabled, the FLISR devices automatically isolate the fault location and restore customers in non-faulted zones. A troublemaker is also concurrently dispatched to validate the outage location, identify the specific damage, and manually perform further switching and restoration of customers, where possible.

T-men primarily focus on substation, circuit, and mainline outages, which are frequently restored by the operation of switching equipment. (Restoration may only require resetting some circuit reclosers and/or breakers.) Under the direction of the control center, the Troublemakers perform most switching assignments necessary to locate and isolate outages. If the Troublemakers are not able to conduct the repair on their own and a repair crew is needed, the Service Planning and Maintenance Supervisor dispatches the repair crew.

During a Level 2 or greater activation, if additional assessment teams are needed (Make Safe, Substation personnel), the OEC Commander determines, in collaboration with the Operations Section Chief and Planning and Intelligence Section Chief, what assessment teams will be needed and where they will be deployed to support the response.

The additional assessment crews are managed by the OEC Dispatch Leader, with support from the Incoming Assessment Desk Leader. The field assessment personnel assess damage and report information to the Incoming Assessment Desk Leader in the OEC or DSR. The Incoming Assessment Desk Leader monitors OMT and ensures work requiring design and compliance specifications are processed by estimating. Assessment information is placed in a job packet and is handed off to the Repair Branch Director of the local service yard in the District Storm Room (DSR). The Repair Branch Director then assigns work to crews for repairs.

As indicated in Section 2.2, often during Level 2 or greater emergencies, non-Qualified Electrical Workers (non-QEW) resources serve as standby and damage assessment teams to perform specific functions. These non-QEW resources can be paired with a gas service employee who has an FAS unit in the vehicle. The FAS unit can then be used to communicate outage information, resource deployment status, and materials to OMT, and immediately supports accurate messaging to the customer.

When there are a significant number of outages, Rapid Assessment Strike Teams are requested through the OEC or REC Logistics Section (after local estimator resources have been exhausted). These teams quickly patrol damaged areas, conduct damage assessments, and relay the information to the Incoming Assessment Desk at the DSR/OEC. This assessment information enables the efficient dispatch of crews to make repairs and restore power to customers in a timely manner when there is a high outage volume.

During OEC activations where Central Electric Dispatch retains control of dispatching all T-men and 911 Standby personnel, the Restoration Supervisor is located at the OEC and coordinates and communicates the assessment priority and status with Central Electric Dispatch.

### 3.2.3.5.7 Dispatch and Increased Outage Volume

Central Electric Dispatch retains dispatch of all tags and T-men until the outage volume overwhelms their available resources and bandwidth. At that point, Electric Dispatch can delegate part or all of their dispatch responsibilities to the OEC Dispatch.

To delegate dispatch responsibility to an OEC, the Electric Dispatch Manager or Supervisor(s) will work with the On-Call OEC Commander to evaluate the type of dispatch work that will be handed off to the OEC Dispatch. Once this has been determined, the Restoration Field Operations Manager or System Operations and Control Manager will reach out to the M&C Superintendent to request that the OEC is activated in the appropriate division.

In addition to assisting with the dispatch of T-men and 911 Standby, the OEC will also dispatch non-Troublemens assessment resources (i.e. estimators, crews, etc.) to assess outages.

### 3.2.3.5.8 Job Package Process

Refer to Figure 3.2 for a high-level process flow diagram on the following job package process.

Outage information comes in to PG&E in the following ways:

- Customer call to report power outages, wires down, arcing wires
- 911 agency call to report downed wires
- Smart meter

The CCOutage (Customer Care Outage) is used by the Customer Service Representatives to enter customer call information and by Gas Dispatch to enter 911 agency call information. This entry automatically generates an OMT Trouble Report. Central Electric Dispatch then dispatches troublemen to perform the assessment. (During larger events, the OEC may instead dispatch damage assessors or Rapid Assessment Strike Teams to conduct the assessment.) The field personnel (i.e., T-men, damage assessors, or Rapid Assessment Strike Teams) conduct the assessment and provide the following to the incoming assessment desk at the DSR<sup>2</sup>:

- List of materials needed
- Damage information
- Photos, if a smartphone is available
- Location information

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<sup>2</sup> Note an incoming assessment desk may also be located at a base camp or in the field during a circuit or area-based strategy.

The way information is provided to the incoming assessment desk depends on the technology available. For example:

- T-men and GSRs can enter the following information in FAS—ETA or ETOR, comments for the Customer Service Representative (CSR), repair time, IVR cause, and materials information. The data entered in FAS / Mobile Application (MA) is automatically updated in OMT, and an EC Notification is automatically created for the incoming assessment desk to view.
- Damage assessors and Rapid Assessment Strike Teams may call or bring the information in to the incoming assessment desk, if a smartphone is not available.
- If a smartphone is available, damage assessors and Rapid Assessment Strike Teams take pictures of the damage, the material list, and the location details (latitude/longitude and address) and email it to the incoming assessment desk.

The incoming assessment desk validates the information, starts the EC Form (or prints the EC Form if received electronically), logs the information on the work location log, and enters or validates the information in OMT. After this:

- If it involves facilities that require loading or sizing (e.g., transformers, poles, etc.), an estimator's input is needed, and they create the job package.
- If an estimator's input is not needed, a PS&R Specialist, Estimator or Clerk provides the EC Form and Map to the Work Assignment Desk for dispatch of a repair crew.

Job packages include the following information (**bold** = minimum required):

- **EC Form**
- **Map**
- Material List
- Transformer / Equipment Data Sheet
- Pole Numbering Form
- Form 48: Emergency / Urgent Joint Pole Replacements
- Incident Report Form (62-0719) and Hazardous Waste Form, if needed
- Pictures (Latitude / longitude readings are included on pictures or on the map)
- Job Package Cover Sheet

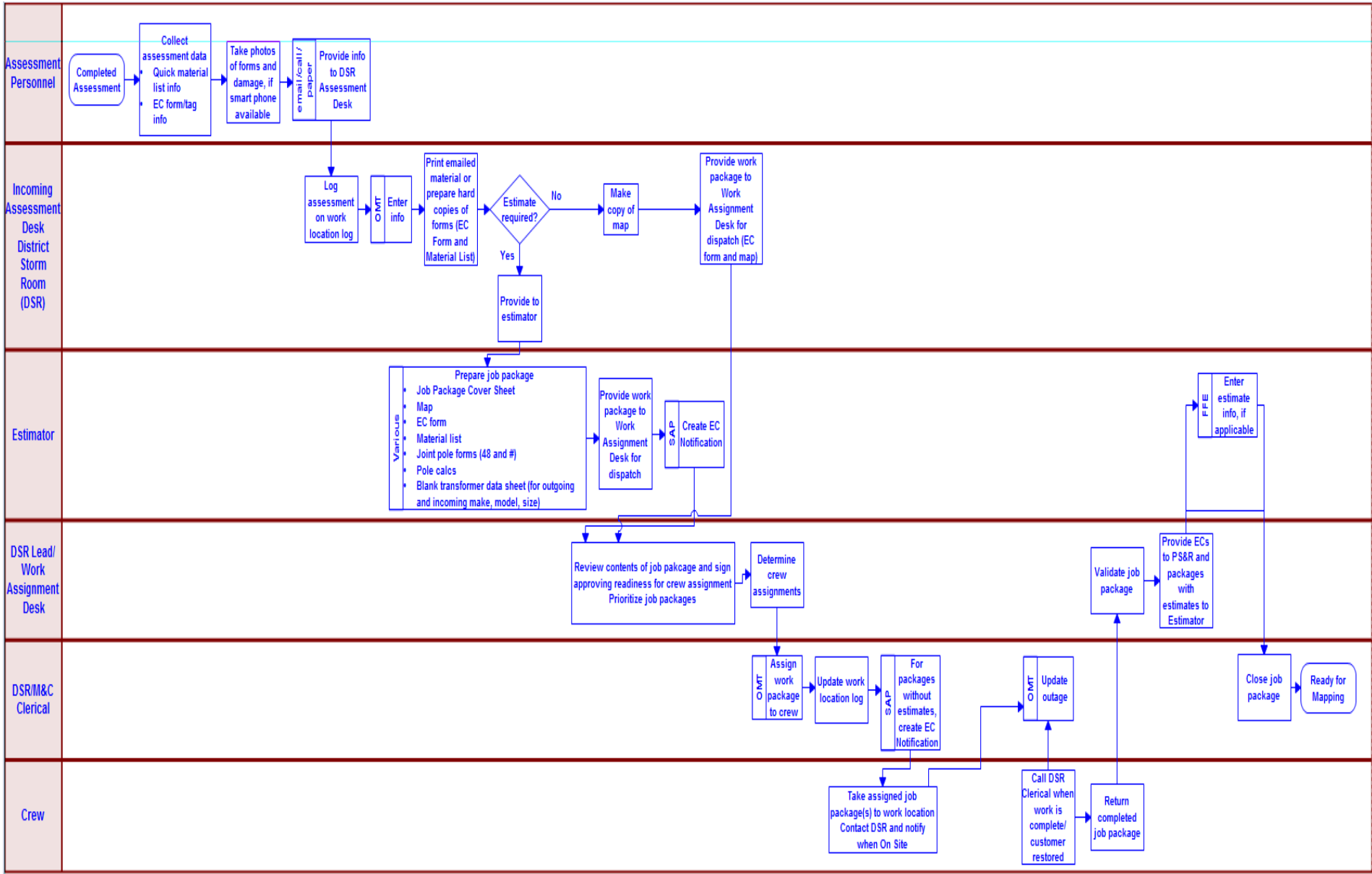
Once the job package/EC Notification creation is completed, it is provided directly to the DSR Lead or, for larger events, to the work assignment desk. Next, the DSR Lead or work assignment desk reviews each job package for completeness, approves the job package by signing the cover sheet, prioritizes the job packages and determines crew assignments. Clerical support then enters job package crew assignments in OMT and maintains the work location log.

Crews take their assigned job packages to the work location and contact the DSR that they are on site. The DSR will update OMT indicating the onsite of the crew. The crew will then complete the work in accordance with PG&E construction standards and call the clerk in the DSR when the customers are restored/work is completed. The clerk then updates OMT

indicating the work is completed. The crews bring the completed job package back in to the DSR when they return from the field, the crew foreman signs the job package and EC notification as completed, ensures any redline changes are properly documented on the job sketch and EC Notification(s) and the EC Notification(s) and job package process is then validated and closed out.

Electric Annex to the CERP

Figure 3.2 Job Package Process



In a circuit-based strategy, the task force conducts the process in Figure 3.2 out in the field or at a base camp. Additional details include:

- Estimators may be integrated with task forces to create and assign job packages/EC Notifications in the field or at a base camp.
- The Task Force Leader calls the control center to true up outage locations with OMT.
- The Task Force Leader also brings the information in to the DSR, where they validate and provide quality control, and then send the EC Notification to PS&R to conduct the close out process.

In larger events, an area-based strategy may be used where a district or division may be divided into smaller geographic areas or branches. (Refer to Area-Based Strategy in Section 3.2.3.8.3 for details.) In this case, the process above remains the same, whether the incoming assessment desk and work assignment desk are located at the DSR, in the field, or at a base camp.

As mentioned previously, Transmission may be integrated into the DSR/OEC when there are both transmission and distribution outages. When there is a transmission line outage that does not impact distribution, the main steps of the process above are still followed. (A log is created at an incoming assessment desk, transmission estimators provide needed input to the job packages, and the work assignment desk dispatches the job packages to the crews).

### 3.2.3.6 911 Standby Call Response

During emergency events, downed utility equipment can pose a public safety hazard. Often in these scenarios, governmental agencies such as fire and police personnel will arrive at the site of the hazard to protect the public. In these situations, the agencies need to be relieved by PG&E personnel so that they can be free to respond to additional priorities. During large-scale events when a significant number of hazards may exist, promptly relieving these agencies becomes critical for public safety. Therefore, PG&E operates a 911 Standby Process, where PG&E personnel relieve on-site agency personnel and, in turn, protect the public from any hazards.

#### 3.2.3.6.1 911 Standby Process

After Gas Service Dispatch fields a call from an agency asking for 911 standby relief, PG&E Central Electric Dispatch receives this information and dispatches PG&E personnel to the site. (Refer to Figure 3.3 for a high-level 911 standby process flow diagram.)

For a Level 1 incident, a T-man is called to respond. If the T-man is not available, or their ETA is greater than 45 minutes, 911 standby or make safe personnel are dispatched. During larger events, such as a storm, Electric Dispatch may first call the following to determine if 911 standby resources are available:

- Restoration Supervisor
- Field Operations
- Field Metering Operations



- Gas Operations

To ensure a timely response to agencies, PG&E uses a 911 agency callback process. When agencies call PG&E requesting on-site relief, they may request a callback to confirm relief personnel have been dispatched and receive an estimated time of arrival (ETA).

PG&E has established callback expectations, as follows:

- Contact the requesting agency within 20 minutes of their initial request
- Provide the agency with an estimated time of arrival for PG&E relief personnel
- Update the information and call notification in their OMT tool and monitor until the agency has been relieved

### 3.2.3.6.2 911 Standby Personnel

In accordance with General Order 166 Standard 9; Personnel Redeployment Standard, PG&E trains additional personnel to support 911 standby request during storm and catastrophic events. When possible, resources are pre-staged based on forecasted SOPP model impact. These employees guard a location until a qualified electric crew or T-man arrives to clear and or repair the hazard.

Standby personnel are one or two-person crews with limited knowledge of field equipment. These crews often consist of meter readers, meter technicians, gas service representatives, or gas construction workers. Standby crews generally do not have equipment switching skills, or the ability to estimate the magnitude of the repair and restoration timeframe. They are used primarily as “standby” to relieve a 911 agency. 911 Standby training is facilitated by PG&E leadership using established training material and including the presence of a qualified electrical worker to assist in training facilitation.

911 Standby personnel are dispatched to each location using the Outage Dispatch Tool in OMT. Personnel are dispatched using the crew type “Standby”. Outage orders with a crew type of “Standby” will be prioritized to ensure a T-man or make safe is dispatched to address to public safety condition and relieve the 911 standby personnel.

### 3.2.3.6.3 911 Standby Kits

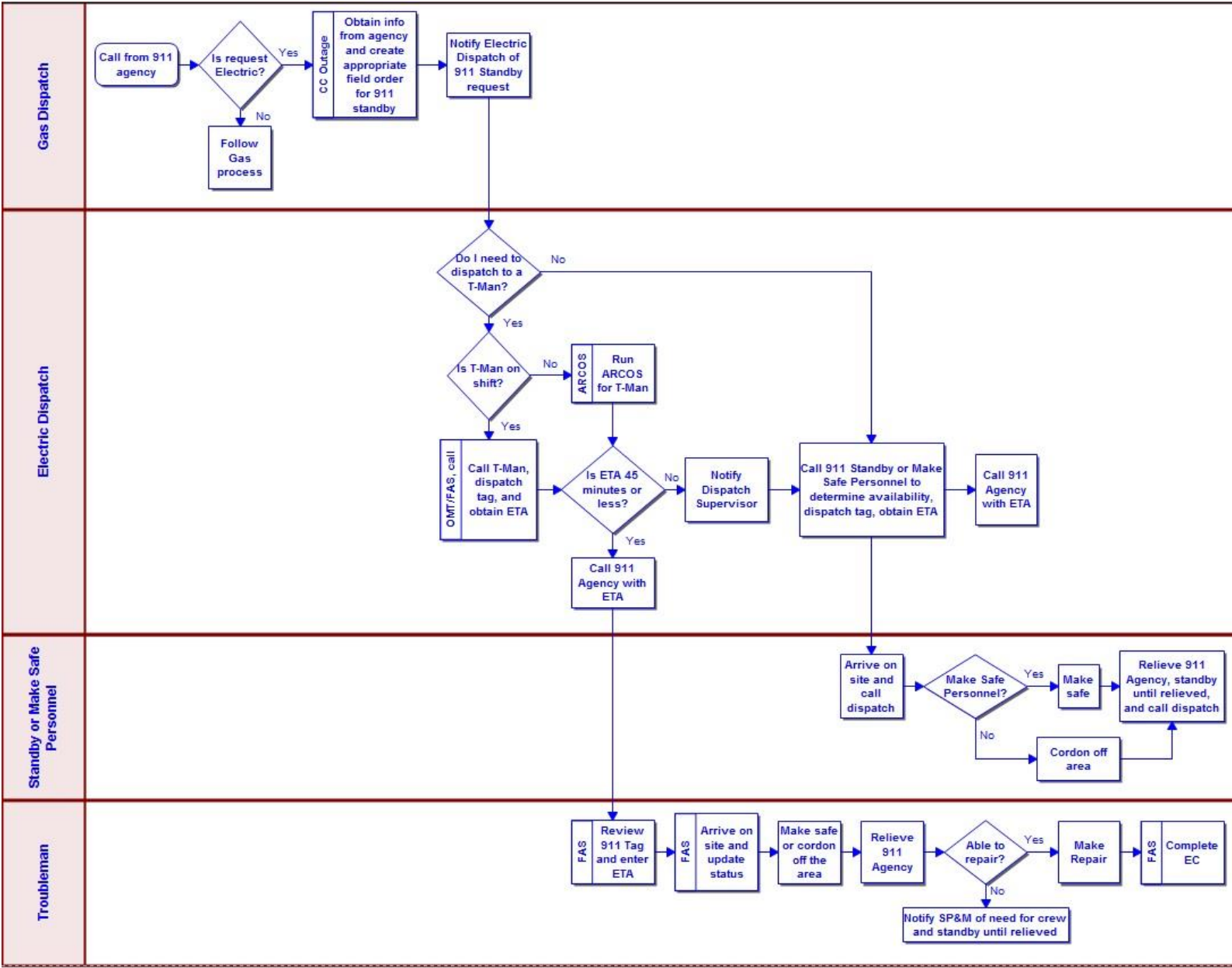
Employees who do not have an assigned vehicle with the needed equipment to perform their duties as standby crews can use established standby kits. At a minimum, standby kits include the following items:

- Traffic cones (5)
- Flares (10)
- Barricade tape (2 rolls)
- Flashlights (2)
- Gloves (2 pair)
- Hard hats (2)
- Safety vests (2)



- Raingear (Optional)

Figure 3.3 911 Standby Process



#### 3.2.3.6.4 911 Calls on Large Events

In large events, such as earthquakes, Gas Dispatch will staff the appropriate amount of resources to take incoming 911 agency calls. Electric Dispatch also has personnel, if needed, to take 911 standby calls at the Fresno RMC, which consists of clerical employees.

When the outage volume and number of 911 calls overwhelms Central Electric Dispatch's available resources and bandwidth, Electric Dispatch can also delegate part or all their dispatch responsibilities to the OEC. Refer to Section 3.2.3.5.7 for details.

#### 3.2.3.7 Make Safe

If the volume of outages exceeds the number of troublemen, Title 200 (M&C division) crews can be broken up into two-person teams to address hazardous conditions. These teams are managed by the Dispatch Leader in the OEC, who is responsible for prioritizing, dispatching, and tracking all work performed. When outage volumes reduce to the point manageable by the troublemen, these make safe teams are remobilized as crews and redeployed to repair and restore service.

#### 3.2.3.8 Response Strategies

PG&E may use different assessment and restoration strategies based on the complexity of each incident. For example, if there is a small number of outages during a routine response, PG&E uses an order-based strategy. In larger incidents with a greater number of outages, it may no longer be efficient to assign work by individual orders. In this case, work may be assigned by areas or circuits to improve coordination and assessment/restoration time.

##### 3.2.3.8.1 Order-based Strategy

In an order-based strategy, in alignment with the above mentioned priorities and depending on the amount of damage, troublemen or repair crews are assigned to each individual outage order, as appropriate. For example, in Electric Distribution, as outages come into OMT, a unique OIS number is automatically created for each outage. Central Electric Dispatch then prioritizes and assigns each outage order to a T-man.

##### 3.2.3.8.2 Distribution Circuit or Transmission Line-Based Strategy

In Electric Distribution, a Circuit-Based Strategy is designed to improve coordination, assessment, and restoration of highly impacted circuits with multiple cases of trouble, and can be used on any circuit identified as high risk. These circuits may warrant a circuit-based assessment and restoration strategy depending on characteristics including, but not limited to, the following:

- Weather forecast
- Actual conditions
  - Significant number of outages and damage locations
  - Control center call volume

- Management of outage communications

The circuit-based strategy is implemented at the request of the OEC or REC Commander. In a circuit-based strategy, a task force may be assigned to an entire substation, a specific circuit, or source side device to manage either pre-identified high-risk circuits, or circuits that meet outage and/or hazard thresholds during a storm event. This task force may be comprised of a Task Force Leader and the following strike teams: troublemen, rapid assessment, vegetation management, 911 standby, and make safe. (Refer to Figure 3.4 for an example circuit-based task force organization structure.)

Troublemen Strike Teams assess the primary line damage starting from the circuit breaker (CB) or source side device, at the direction of dispatch, the control center Distribution Operator (DO), or the Task Force Leader. They then identify damaged equipment locations, make locations safe, and report findings to the Incoming Assessment Desk.

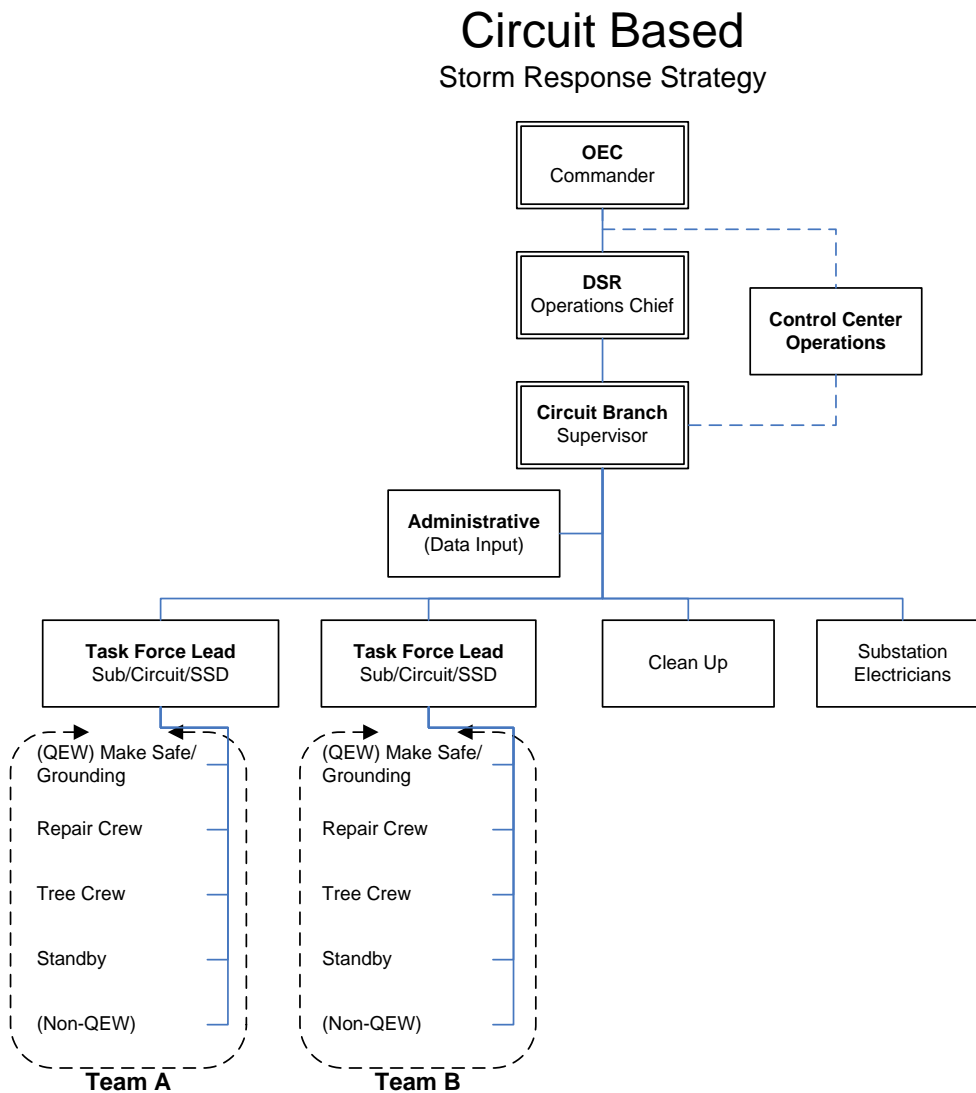
Repair Strike Teams follow the Troublemen Strike Teams, under the direction of the Task Force Leader, and are responsible for:

- Making the primary main line safe
- Reporting damage to the DSR
- Making repairs and restoring primary main line sections, as they become available, under the direction of the DO
- Assessing radial/tap lines for damage, report, repair, and restore

For additional details, refer to the Circuit-Based Structure and Strategy Guidance Document.

For Electric Transmission, a Line-Based Strategy may be followed to improve coordination, assessment, and restoration of highly impacted lines with multiple cases of trouble. The Line-Based Strategy is implemented at the request of STOEC/ETEC, and additional crews are assigned to the highly impacted lines.

Figure 3.4 Example Circuit-Based Organization Structure



### 3.2.3.8.3 Area-Based Assessment / Restoration Strategy (Branches)

When there is a larger volume of outages or damage in an area, it is no longer efficient to assign work based on individual orders. Instead, an area-based restoration strategy is used to assign work by geographic areas or circuits.

The positions listed in Table 3.2 below determine how to divide an area, based on:

- The location and volume of damage or projected damage
- Geography (e.g., an area is divided by a river, mountain range, etc.)
- Customer density

Where possible, the determination of the areas is made using the SOPP Model prior to an event, such as an incoming storm, etc.

**Table 3.2 Electric Authority to Determine Areas**

Area Being Divided	Who Determines Areas?	Who Approves Areas?
Divide district or division into smaller areas/branches <sup>3</sup>	REC Planning and Intelligence (P&I) Chief in collaboration with the Operations Section Chief (OSC), and with input from the Logistics Section Chief (LSC).	REC Commander
Divide STOEC into areas/branches <sup>4</sup>	ETEC Lead working with STOEC IC	ETEC Lead
Divide region into smaller areas/branches	EOC P&I Chief in collaboration with the OSC, and with input from LSC on support.	EOC Commander
Any divisions made due to an earthquake	EOC P&I Chief working together with the OSC, after reviewing the damage model. The LSC also provides input on support.	EOC Commander

In the field, Task Force Teams are assigned to Branches and are responsible for all damages in their area until restoration is completed.

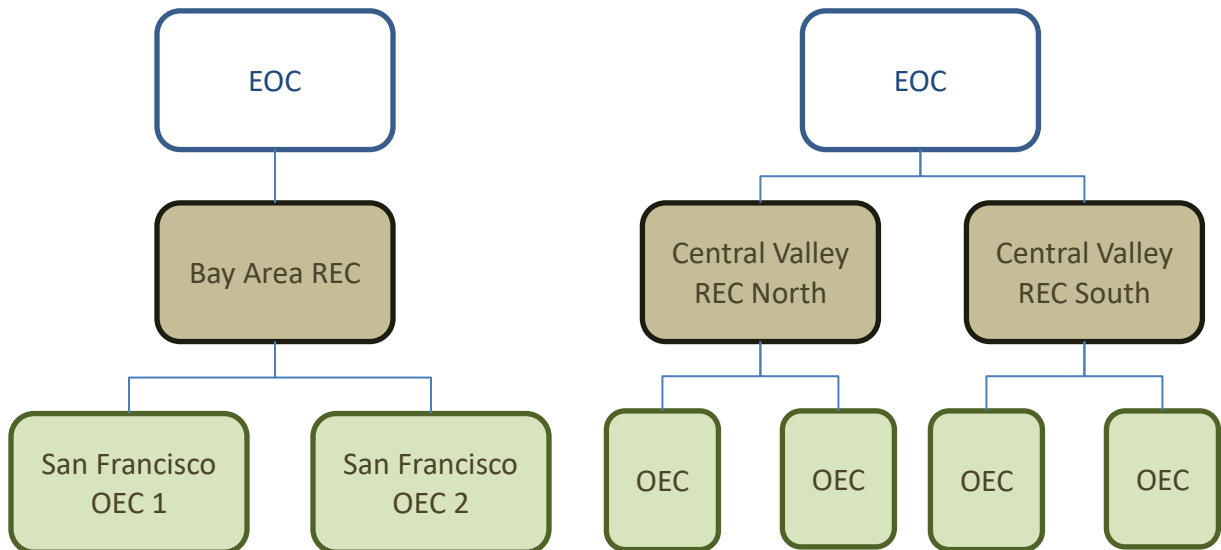
Following a Level 4 or 5 event, such as a significant storm or earthquake, damages will be widespread, multiple commodities will be impacted, and thousands of personnel may be required to restore the system. It is not enough for one local OEC to manage many major incidents with extensive damage in one division, for example.

<sup>3</sup> If the EOC is activated, the determination and approval of the areas are made at the EOC, with input from the REC and ETEC.

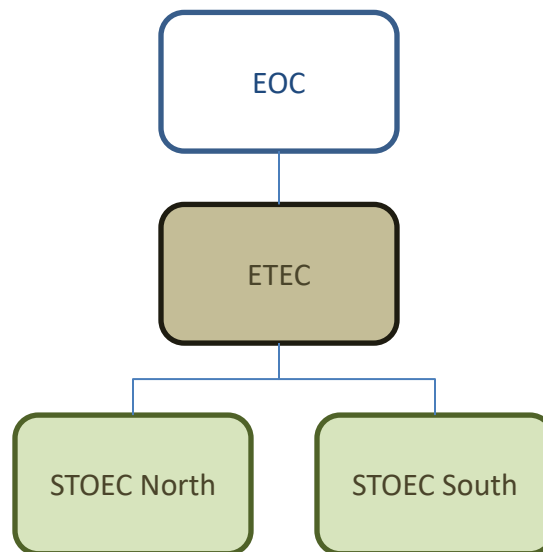
<sup>4</sup> Ibid.

To effectively manage the event and maintain an adequate span of control, an REC's, OEC's, or STOEC's operational control may be divided into smaller areas (or Branches), as needed. (Refer to Figure 3.5 and Figure 3.6 for example branches.)

**Figure 3.5 Example of OEC or REC Divided into Branches**



**Figure 3.6 Example of STOEC Divided into Branches**



Following a significant earthquake, a damage model is run based on the United States Geological Survey (USGS) shake maps. The EOC Planning and Intelligence Section Chief, in collaboration with the EOC Operations Section Chief, will review the damage model information and identify if additional RECs, OECs and STOECs are needed. The EOC Logistics Section Chief also provides input on whether they can support the areas, and the EOC Commander approves the plan.



The EOC Commander, or designee, then notifies the REC Commander and the ETEC Lead of any needed changes to the organization or jurisdictional control, such that pre-identified teams (leadership, administrative, assessors, Service Planning and Maintenance crews, etc.) can mobilize and make their way to the affected area. (Refer to Figure 3.7 below for example branches for a catastrophic event and Figure 3.8 for an example area command organization structure.)

Once a divided area has completed restoration of its responsible area, or if the existing REC, OEC or STOEC is ready to resume responsibility, the divided area will return to the existing emergency center for jurisdictional control.

Map of Existing Model in San Francisco (SF)



Example Map of SF Branch's Areas

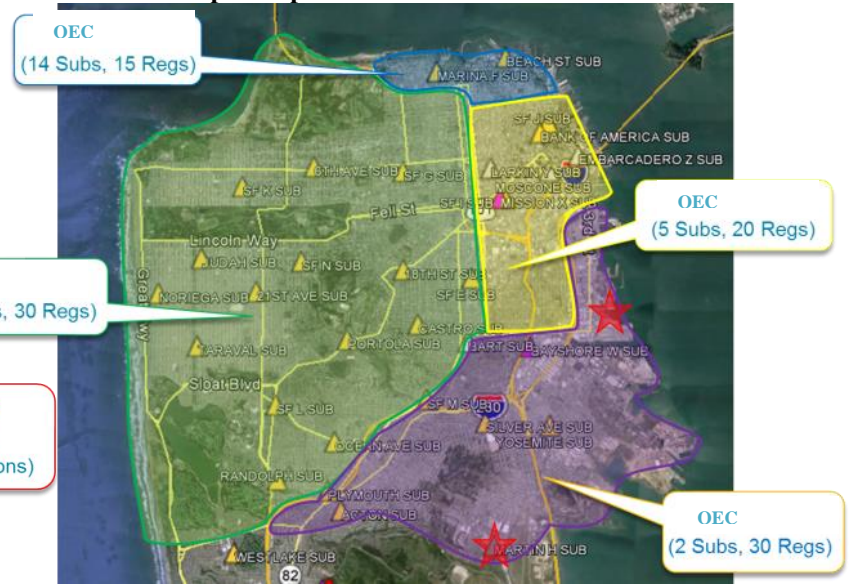
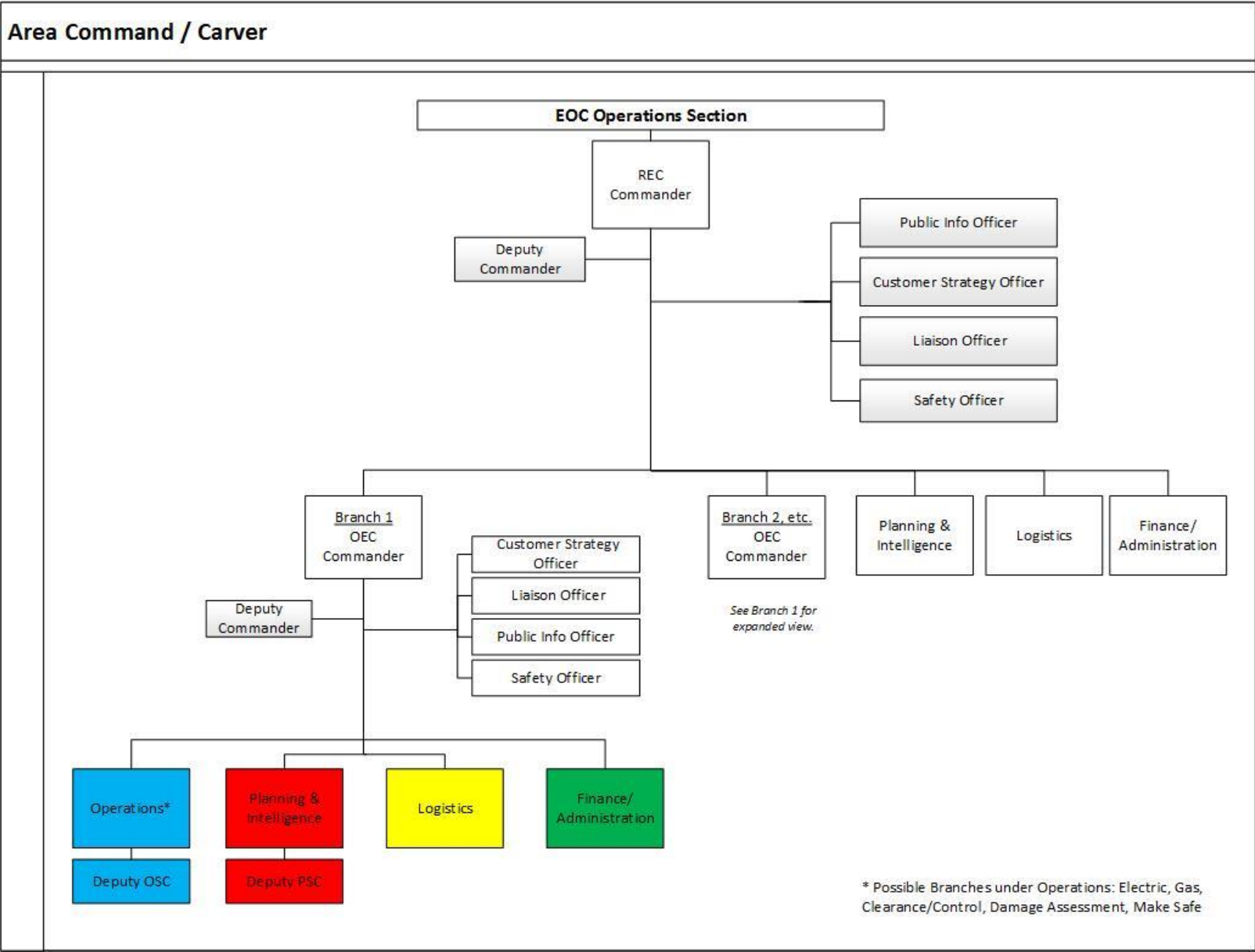


Figure 3.7 Example Areas (Or Branches) For a Catastrophic Event

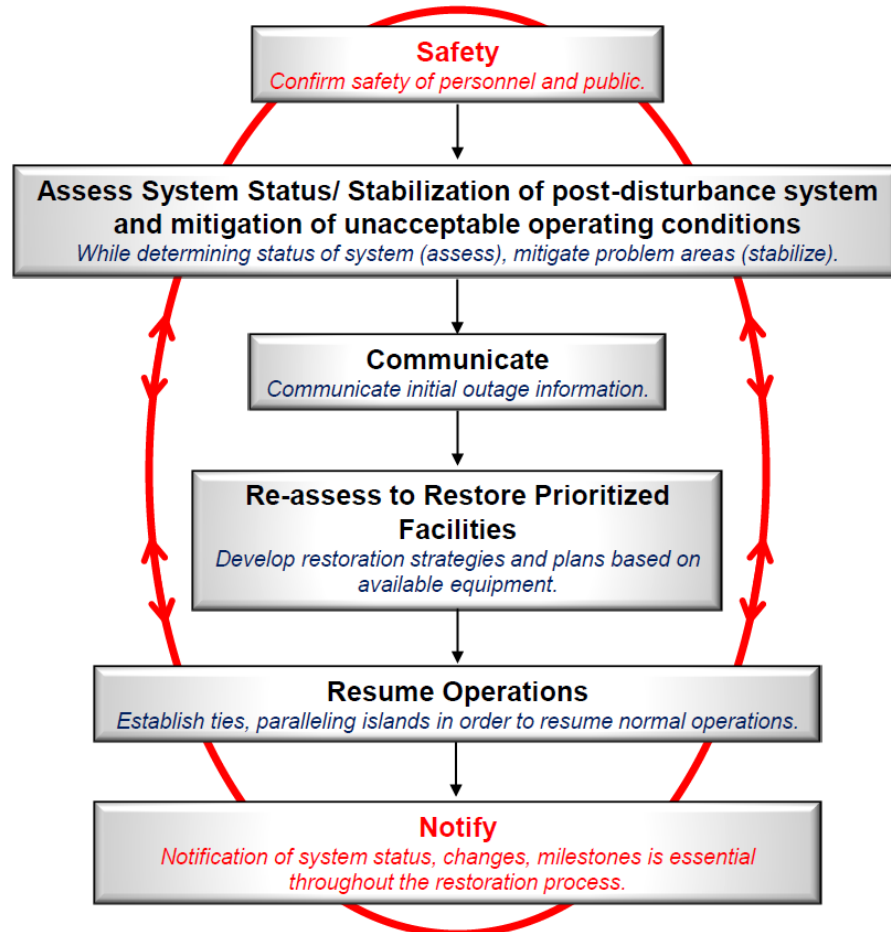


Figure 3.8 Sample REC Area Command Organization Structure



#### 3.2.3.8.4 Electric Transmission Restoration Strategy for Large Scale Blackouts / Post Disturbance

When an operator becomes aware of a system disturbance and large-scale outage, the following diagram provides a strategic and prioritized approach to system restoration.



The first priority is to confirm the safety of personnel and the public. Next, in the event of a partial or complete system outage, the system must be assessed to determine the status and state of the system and facilities, and if conditions exist that require the mitigation of unacceptable operating conditions.

Initial outage information is then communicated to the following (not necessarily in this order):

- CAISO
- System Dispatchers
- Transmission and Distribution Operators
- Short-Term Electric Supply
- Federal, State, and Local authorities and agencies
- Generating plant personnel
- Substation personnel
- Management
- Exterior Generating entities

- Corporate Public Relations

In alignment with the prioritization guidelines mentioned in Section 3.2.3.1, re-assessment is then conducted to restore prioritized facilities, generation, and loads. (Note the utilization of load focuses on the stabilization of the system rather than the immediate need to restore customers.)

PG&E and CAISO can resume normal operations once the system restoration emergency has been terminated, authority has been returned to CAISO, and CAISO has lifted the suspension on CAISO markets. Normal operations can resume at the point in the restoration process when the next load to be restored is not driven by the need to control frequency or voltage.

Steps for resuming normal operations include:

- Establishing additional transmission ties, starting with restoring the strongest ties first.
- Synchronizing/paralleling islands

It is essential throughout the restoration process that changes in system status, changes, and milestones, etc. are communicated. Notifications should be made to:

- Reliability Coordinator
- WECC
- Balancing Authorities
- Transmission and Distribution Operators
- External Government agencies
- Corporate entities
- Internal News media

For additional information on black start resources and restoration principles, refer to the Electric System Restoration Guidelines (ESRG).

#### 3.2.3.8.5 Electric Substation

During Levels 1 and 2 incidents, assessment and restoration priorities are established locally between the SM&C Superintendent and the GCC. When STOEC is activated during Level 3 or greater incidents, priorities are established between the STOEC and the GCC, or ETEC, if activated. In the event of only localized damage, the local Distribution Operations organizations may suggest or request priority for restoring distribution customers.

SM&C provides a resource pool that can assist in performing switching inside substations, demolition, cleanup, reconstruction work, and other functions. SES, System Protection, and Automation/SCADA provide engineering services to support restoration activities, as needed.

The following are some of the strategies to restore customers impacted by a substation emergency:

- Splitting of buses
- Step restoration supported by Transmission and Distribution field level switching

- Bypassing of substations to restore downline capacity
- Above ground cabling
- Mobile substation generation
- Transmission-level islanding conditions

Execution of these strategies will be facilitated in the IC call process, as stated in Section 3.2.3.4.1.

#### 3.2.3.8.6 Electric Distribution Critical Customer Strategy

PG&E currently maintains in OMT lists of critical and essential customers (as defined in Section 3.2.3.2 and the CERP). When an outage occurs involving a critical or essential customer, it is noted in OMT, and those circuits are considered for priority assessment and restoration. During the outage event, the Customer Care Organization will assign a Customer Strategy Officer (CSO) in the REC or OEC to serve as the affected customer's point of contact.

To facilitate efficient restoration of a county's prioritized customers, Emergency Management, in collaboration with each division's Superintendent, has put together critical customer care packages that include key information on the customer (e.g., map, equipment information, key pictures, contact information, etc.). These packages will be kept at the OEC. When an outage occurs that impacts one of the prioritized customers, the appropriate customer package is quickly assigned to field personnel to begin assessment and restoration efforts.

PG&E has also further prioritized its internal list of essential and critical customers for restoration following a catastrophic event. These priorities are reflected in OMT reports, and their status and restoration can be tracked by the EOC/REC/OEC, customer relationship managers, and other company personnel. PG&E's prioritized lists of critical and essential customers will be shared with County governments for their review if the County signs a non-disclosure agreement.

#### 3.2.3.8.7 Electric Distribution Catastrophic Event Strategy

When there are many outages related to a catastrophic event, leadership may decide to implement a resource allocation strategy called "60-30-10". This strategy directs resources according to the following model:

- 60% of resources are dedicated to addressing outages that have the highest number of customers out of power and/or length of outage, including considerations for equipment with extensive damage or equipment that is especially critical (e.g., certain substations, etc.).
- 30% of resources are dedicated to the assessment and restoration of the prioritized customers, that were determined in collaboration with our government partners, and PG&E's prioritized critical and essential customers. Depending on the type of catastrophic event and the situation in the community, this percentage may also include dedicating resources to key customers that are required to stand up a community quickly (i.e., community normalcy customers).

- 10% of resources are dedicated for priority or unique issues encountered throughout the ongoing assessment and restoration process.

### 3.2.3.9 Capacity Emergencies

During a system-wide capacity event, it is the System Dispatcher's duty to direct the execution of the CAISO's orders. In a localized event, the System Dispatcher is responsible for maintaining the integrity of the electric system.

### 3.2.3.10 Restoration Work Plan and Strategic Worksheet

To support the development of a restoration and resource movement strategy during an event, PG&E uses a tool to forecast the system-wide Estimated Time of Arrival (ETA) and Estimated Time of Restoration (ETOR). The Restoration Work Plan was built to identify geographic areas that may be in need of more personnel to support restoration efforts. The tool utilizes current and forecasted outage and resource counts to estimate the total time of restoration on system-wide, regional and divisional levels. Historical assessment and restoration times for the current type of weather event and geography drive resource productivity assumptions. By comparing the ETOR across all PG&E divisions, incremental resources can be directed towards those geographies that need them most. The Restoration Work Plan can also be used to analyze the impact of any number of scenarios. For example, the impact on the overall ETOR due to an incoming storm or the addition of mutual assistance crews can be forecasted.

The Emergency Response Strategic Worksheet (located in the [Emergency Management Website](#) under Templates) works in tandem with the Restoration Work Plan by enhancing the ability of Emergency Management personnel to develop local tactical plans. By supporting the development of ETORs and ETAs, the Strategic Worksheet enhances the development of local resource allocation plans. Estimates are created by inputting resources, outages, and equipment damage into the worksheet and can be utilized and continually updated during an event.

### 3.2.3.11 ETA and ETOR

In accordance with G.O. 166, it is important to regularly provide accurate and timely Estimated Time of Arrivals (ETAs) and Estimated Time of Restorations (ETORs) to our customers, in addition to quickly and safely restoring their service. This can only be achieved with the participation and partnership of the following during Level 1 incidents:

- Control center leadership has oversight responsibilities and ensures action is taken to provide accurate and timely outage communications.
- Central Electric Dispatch dispatches tags to the T-men and contacts them if an ETA has not been entered in a timely manner, or if the Automatic ETOR (Auto-ETOR) is about to expire.
- T-men enter an ETA, enroute, and onsite status in FAS. They also update the ETOR in FAS if they are restoring power to the customers. If a crew is required, T-men update the Estimated Repair Time (ERT).

- When a crew is needed, the crew communicates their ETA, enroute and onsite times and will verify the ETOR with the work assignment desk. Communication will be made directly with the assigned crew confirming on site status if a proactive call from the crew is not received.
- During Transmission/Substation sustained outages, Transmission/Substation provides an ETOR to the control center on a coordination call.

During escalated events, it is essential to continue to provide accurate communications to our customers. In these more complex events, the Auto-ETOR is disabled and an outage communications strategy is determined to provide more realistic estimates to our customers.

Listed below are the roles and responsibilities in developing an ETA/ETOR Strategy:

- Planning and Intelligence develops the ETA/ETOR strategy and operational period objective recommendations, using the Strategic Worksheet as a tool.
- The emergency center commander reviews and approves the ETA/ETOR strategy and objectives.
- The Dispatch Leader directs data entry for ETA input, using the forecasted assessment time as a guideline.
- Once assessment has taken place and the outage is in the restoration filter in OMT, the DSR directs data entry of a thoughtful ETOR that accounts for resource availability, repair time, and weather conditions.
- When a circuit-based strategy is used, the Circuit Branch Director, or their Deputy, directs data entry input for ETA/ETOR.
- Customer Care works with Government Relations, External Media and Contact Centers to use other forms of communications to provide outage information to customers in OMT and to escalate issues to the emergency center commander.

For additional details on communicating ETORs to our customers, refer to Section 4.2.1.1 Customer Outage Communications and 4.2.4 Major Outage Reporting.

## 3.2.4 Resource Management

During any emergency event, PG&E personnel play the central role in restoring power to customers. Resources must be organized, assigned, directed, tracked and otherwise managed throughout the duration of an event, to effectively respond. The following describes PG&E's approach in Electric Operations to resource management during emergency events. For additional details on resource management at PG&E, refer to the [Logistics Annex](#).

### 3.2.4.1 Check-In and Check-Out Process

Resource management begins with an accurate check-in and out process of responding personnel. Understanding which resources you have during an event is critical to an effective response.



The Resource Unit will establish and oversee the check-in/out function at designated incident locations. To establish a check-in/out desk, the Resource Unit Leader will assign a Recorder to each location where resources will check-in and out daily. If the Resource Unit has not been activated, the Commander or Planning Section Chief owns the responsibility for setting up the check-in/out process.

After designating a Recorder to manage a check-in/out desk at each facility, the Recorder ensures that every personnel arriving to work an event must check themselves into the event before working. Recorders must have an adequate supply of check-in forms, access and training in ARCOS Crew Manager and be briefed on the frequency for reporting check-in information to the Resource Unit. Keeping accurate accounts of all checked-in personnel is vital and essential for personnel safety, accountability, and fiscal control.

All resources must check in and out daily thru the check in/out desk at their assigned facility. Refer to Section 3.2.4.11 on tracking crews in ARCOS Crew Manager.

Once checked in, crews will receive work packages from the DSR Lead or their delegate. Refer to Section 3.2.3.5.8 for details on creation, distribution and completion of job packages.

### 3.2.4.2 PG&E Contract Crew Support

PG&E has contracts in place to use contract crew and/or equipment resources during incidents where company resources alone are not able to restore our electric infrastructure in a timely manner.

#### 3.2.4.2.1 Contracts for Emergency Response

The Sourcing Department issues contract agreements on an annual basis to help in restoring electric service during an emergency response. Agreements are established with contractors to provide assistance upon request, and includes furnishing personnel, equipment, and/or expertise in a specified manner. During an emergency event, Logistics is responsible for managing the contracts and issuing emergency purchase orders.

#### 3.2.4.2.2 Contract Crew Request

Once a need arises for contract crews, the Contract Logistics Manager makes an initial call to determine current contractor availability on property. If more contract crews are needed, the Contract Logistics Manager contacts the contractors for additional resources. If there is still a shortage of resources, the EEI/Mutual Assistance process is followed to release contract crews from other utilities.

#### 3.2.4.2.3 Dispatch and Supervision of Contract Crews

- The MP&P Contract Logistics Manager works with the EOC Crew Logistics Unit Leader to dispatch all contract/mutual assistance crews to local areas. (MP&P Contract Logistics Manager provides crew counts and availability to the EOC Crew Logistics Unit Leader. The EOC Crew Logistics Unit Leader directs MP&P on where to send the contract crews.)

- MP&P manages contract crew support and works with the Operations Section in the OECs/RECs to provide supervisors/inspectors to support contract crews when they arrive at a base camp or alternative work location.
- The Operations Section in the OECs/RECs is responsible for providing supervisors/inspectors of contract crews after they check in at the local area.

#### 3.2.4.2.4 Record Keeping

The MP&P Central Administration ensures all applicable time for contract crew personnel is logged and tracked, including any associated costs for equipment repairs and required personnel expenses. The MP&P Central Administration, in conjunction with the Distribution Supervisor, reviews and approves Labor, Material and Equipment (LM&E) sheets to validate time and work completion. The MP&P Central Administration enters and tracks costs in their tracking data base and enters goods receipts into SRM/SAP to initiate the payment process.

Refer to Section 3.2.4.11 on tracking contract crews in ARCOS Crew Manager.

### 3.2.4.3 Mutual Assistance

#### 3.2.4.3.1 Agreements and Requesting Mutual Assistance

The term “Mutual Assistance,” in the context of this Annex, is intended to mean any crew from another utility. The company has established agreements [i.e., California Utilities Emergency Association (CUEA) and Western Region Mutual Assistance Agreement (WRMAA), etc.] with other utilities to provide or receive assistance to help restore electric and gas service during a major emergency. There are written agreements with other utilities for providing assistance, upon request, and includes furnishing personnel, equipment, and/or expertise in a specified manner.

Refer to the CERP on how to evaluate the need for mutual assistance, the request process, and record keeping.

#### 3.2.4.3.2 Supervision of Mutual Assistance Crews

The supervision of mutual assistance crews is the same as for contract crews. Refer to Section 3.2.4.2.3 for details.

### 3.2.4.4 Deployment Order and Priorities

Decisions regarding allocation and deployment of resources should be based on priorities that govern assessment or restoration. Refer to the CERP in the Resource Allocation Section for additional details on deployment priorities.

The order for requesting and deploying personnel resources includes, but is not limited to:

- Division
  - T200 distribution (M&C division crews) from within the impacted division
  - T300 distribution (General Construction crews) from within the impacted division



- T300 transmission and T200 transmission from within the impacted division (given there are no transmission impacts or risk)
- Contract from within the impacted division
- Region
  - T300 distribution from within the impacted region
  - T200 distribution from within the impacted region
  - Contract from within the impacted region
- System
  - T300 distribution from less impacted regions
  - T300 transmission and T200 transmission from less impacted regions (given there are no transmission impacts or risk)
  - T200 distribution from less impacted regions
  - Contract from less impacted regions
- Non-electric resources
- Non-PG&E Resources
  - Contract crews from outside utilities (contract crews may be used before GC Transmission Line, depending on the incident)
  - Mutual assistance crews

#### 3.2.4.5 Resource Movement Authorization

The Director of Emergency Management has the authority to move resources across region boundaries during a Level 2 or greater emergency, and in pre-event preparations. In Level 2 emergencies, the OEC Commander has the authority to move resources within their respective division to facilitate restoration of service. In a Level 3 or greater emergency where the REC is activated, the REC Commander (Region Service Planning and Maintenance Director) has the authority to move resources within their respective region.

In a Level 3 or greater emergency where the EOC is activated, The EOC Commander has the authority for all resource allocation and deployment. Resources are deployed in accordance with priorities and strategies recommended by the Operations Section, P&I Section, and Logistics Section. In addition, upon obtaining necessary officer approval, contractors and mutual assistance can be activated.

For Electric Transmission, ETEC develops the resource plan, based on input from electric distribution and transmission. When the ETEC Lead approves the plan, ETEC then communicates the plan to STOEC to execute. (STOEC is responsible for managing the transmission repair workforce during an incident.)

### 3.2.4.6 Resource Movement Management

During emergencies, resource movement logistics are managed by different roles. The table below defines which party executes this responsibility.

**Table 3.3 Resource Managing and Ordering Authorities**

Activation Level	Ordering Authority (D)	Managing Authority (D)	Ordering Authority (T&S)	Managing Authority (T&S)
Level 1 Division / Area	Local Supervisor or above	Local Supervisor or above	Local Supervisor or above	Local Supervisor or above
Level 2 OEC / STOEC	OEC Logistics Section Chief	OEC Resource Unit	STOEC Logistics Section Chief	STOEC Resource Unit
Level 3 or greater REC / ETEC	REC Logistics Section Chief	REC Resource Unit	ETEC Logistics Section Chief	ETEC Resource Unit
Level 3 or greater EOC	EOC Logistics Section Chief (non-personnel request); EOC Crew Logistics (personnel)	EOC Resource Unit	EOC Logistics Section (non-personnel request); EOC Crew Logistics (personnel)	EOC Resource Unit

### 3.2.4.7 Resource Request Process for Electric Transmission and Substation

For Electric Transmission and Substation during Level 1 incidents, the Supervisor secures resources locally. If additional resources are needed, it is escalated to the superintendent, who assists with securing additional resources.

If STOEC or ETEC is activated, a request for additional resources is called in from the field to STOEC's Operations Section. The Operations Section then makes the request to Logistics for additional resources. Upon receipt of the request, Logistics looks within the same area first to secure additional resources. If resources are not available in the same area, Logistics looks to fulfill the request from adjacent areas. If no resources are available, the STOEC Logistics Section Chief submits the request to ETEC, and ETEC provides the request to the EOC Crew Logistics Unit Leader for personnel and the EOC Logistics Chief for non-personnel resources.

### 3.2.4.8 Resource Request Process for Electric Distribution

#### 3.2.4.8.1 For Level 1 incidents:

- For Electric Distribution local headquarters, the on-call supervisor uses the 212 process to secure Title 200 resources locally. If additional resources are needed, the on-call supervisor calls neighboring headquarters or the local GC Superintendent, and then utilizes the local contract crew callout list.

- If more resources are needed outside the division, the on-call supervisor contacts the on-call supervisors from adjacent divisions within the Region. Then ARCOS can be used to callout resources from the 212 list in neighboring divisions.
- If more resources are needed outside the Region, the M&C Superintendent will call the EOC On Call to request support. The EOC On Call will then engage EOC Crew Logistics Leader to facilitate meeting the request.

#### 3.2.4.8.2 For Level 2 or greater incidents:

- The DSR submits a resource request to the OEC Logistics Section. The OEC Logistics Section works with the Resource Unit to determine which resources to move.
- If they do not have enough resources within the division and the:
  - REC is not activated, the OEC Logistics Chief contacts the EOC On Call, who will then engage the EOC Crew Logistics Leader to meet the request.
  - REC is activated, the OEC Logistics Chief will call the REC Logistics Chief with the request. The REC Logistics Chief then works with the REC Resource Unit to determine the availability of resources.
- If resources are needed outside the region, the REC Logistics Chief submits the request to the EOC Crew Logistics Unit Leader for personnel and the EOC Logistics Chief for non-personnel resources. They then work with the Resource Unit Leader to determine if there are resources available in another region. If the request can be filled, both the sending and receiving REC Logistics Chiefs are informed.
- If existing resources are not available, the EOC Crew Logistics Unit Leader requests available resource numbers from the Contracting Manager and Mutual Assistance Manager and decides which resources to activate, upon obtaining needed EOC Commander/Officer approvals.

#### 3.2.4.9 Base Camp Determination and Electric Operations Staffing

Based on the Electric Damage Model and submitted requests for base camps to the EOC, the EOC Operations Section works collaboratively with the RECs, the EOC Planning Section, and the EOC Logistics Section to determine the number and locations of base camps and staging areas, if needed. Once the base camps and staging areas are determined, an Electric Incident Management Team (IMT) is dispatched to each base camp to support the incident. An Electric Staging Area Manager, Dispatchers, Distribution Operators and support personnel are also deployed to the base camps and staging areas, as needed.

In the event of a catastrophic incident, several IMTs were pre-identified, paired with IMTs from a different Region, and pre-trained on each other's areas. As a result, these IMTs can be quickly secured from outside the impacted area to staff the base camps and staging areas.

For additional details on base camps, micro sites and staging areas, refer to Logistics Annex. For details on Incident Management Teams (IMTs), refer to the CERP.

### 3.2.4.10 ARCOS—Automated Roster Callout System

ARCOS, or Automated Roster Callout System, is an automated callout and scheduling system that PG&E uses to assemble and track first responders and repair crews in response to electric emergency outage situations / unplanned events. By using ARCOS over manual methods, PG&E can automate and streamline the callout process and reduce outage duration times for customers (due to faster callout and on-site times).

PG&E uses the following modules of the ARCOS Suite for day-to-day operations, as well as major storm events:

- ARCOS Callout is used to call union employees via phone, email, and text messaging services to respond to unplanned events, in adherence with their bargaining agreements.
- System Outage Staffing (SOS) is used to identify and call out resources based on qualifications or location. It is also utilized to conduct an interactive callout where employees can respond to targeted questions, such as, “Can you respond?”
- SIREN is used to broadcast mass notifications to employees, partners, and other organizations in the event of an emergency.

### 3.2.4.11 ARCOS Crew Manager

Tracking resources (i.e. personnel) efficiently is essential for safety, accountability, and fiscal control. A large percentage of accidents and injuries on incidents can be directly attributed to the failure to track resources effectively. Furthermore, resources must be organized, assigned and directed to accomplish incident objectives and managed to adjust to changing conditions.

Crew Manager is a module of the ARCOS software suite that incorporates real-time, touch screen, drag and drop management of crews – for both day-to-day operations and major storm events. It also centralizes crews into a single database while providing distributed access to Operations Managers, Field Supervisors and Crew Leaders via touch-screen, interactive whiteboards, tablets, smartphones, and personal computers.

PG&E requires that ALL resources working an event are to be tracked in the ARCOS Crew Manager. This tracking ensures visibility of resources and reinforces personnel safety. Tracking includes documenting all resource check-ins and check-outs daily in Crew Manager, as well as any transfers across division lines.

### 3.2.4.12 Out-of-Region Crew Packets

All headquarters maintain crew packets, containing region-specific information to assist out-of-region crews and Mutual Aid Crews participating in the local restoration effort. The division superintendent ensures that the information contained in the packet is current and available in sufficient quantities.

At a minimum, the following information will be provided:

- Local radio frequencies
- Location of medical facilities (ICS 206)
- Location and layout of base camps (Logistics provides this)
- Phone numbers of appropriate emergency centers and control centers
- Local maps
- Additional information may include unique safety information (ICS 208), local restaurants, etc.

## 3.2.5 Demobilization/Release of Resources

### 3.2.5.1 Demobilization Process

Demobilization includes overseeing and validating the safe and efficient return of resources to their original location and status when they are no longer needed to support the response. Planning for demobilization starts soon after the resource mobilization process begins to facilitate accountability of resources.

The order for demobilization is executed in reverse of the deployment order and includes, but is not limited to<sup>5</sup>:

- Non-PG&E Resources
  - Mutual assistance crews
  - Contract crews from outside utilities
- Non-electric resources
- System
  - Contract from less impacted regions
  - T200 distribution from less impacted regions
  - T300 transmission and T200 transmission from less impacted regions
  - T300 distribution from less impacted regions
- Region
  - Contract from within the impacted region
  - T200 distribution from within the impacted region
  - T300 distribution from within the impacted region
- Division

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<sup>5</sup> The demobilization of resources should follow the order outlined in this section. There may be exceptions to the demobilization order based on the timing of outages and assigned resources.

- Contract from within the impacted division
- T300 transmission and T200 transmission from within the impacted division
- T300 distribution from within the impacted division
- T200 distribution from within the impacted division

The demobilization process involves two-way communications. It can be initiated from the bottom up or from the top down. Ultimately, the highest-level activated emergency center makes decisions on whether resources can demobilize or should be reallocated. This decision is based both on information passed up from the lower level emergency centers, as well as from information garnered through analytic tools.

To ensure personnel safety and to prevent resources from being released in one area when they are needed in another, it is essential that a demobilization process is followed. Below are the responsibilities by Section/Unit in the demobilization process:

#### Resource Unit<sup>6</sup>:

- Identifies excess resources in collaboration with the Section Chiefs and Demobilization Unit and informs their emergency center commander.
- Checks with the Resource Unit at the next level's emergency center to see if resources are needed elsewhere and whether demobilization is authorized. The highest-level activated emergency center makes the ultimate decision to demobilize resources. For example, when open, the EOC considers information and recommendations from the REC/OEC, but it ultimately makes final demobilization decisions.
- Once approval is secured to demobilize, the Resource Unit notifies their Logistics Section and the Demobilization Unit of the excess resources.

#### REC/OEC Demobilization Unit<sup>3</sup>:

- In collaboration with the Resource Unit, assesses the current and projected resource needs and obtains the identification of surplus resources and probable release times.
- Forwards demobilization instructions for field resources from the EOC.
- Creates the demobilization plan and monitors its implementation for their emergency center. [The demobilization plan includes the release priorities, demobilization process, any specific release procedures, responsibilities for implementing the demobilization plan, and directories, if needed (e.g., maps, telephone listings, etc.).]
- Communicates with the sending and receiving offices, as well as the released personnel, to ensure the safe and efficient return of resources.

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<sup>6</sup> If the Resource Unit and Demobilization Unit are not staffed during an incident, the Planning and Intelligence Section Chief is responsible for these functions.

### EOC Demobilization Unit:

- Creates the demobilization plan for the EOC.
- Work with Ops Section Chief and Resource Unit to identify excess resources.
- Creates instructions for the RECs to direct REC and OEC demobilization of field resources (e.g., order for the demobilization of resources, demobilization checklist, safety considerations).
- Is responsible for the demobilization of outside contract, mutual assistance crews, and out of region PG&E crews (i.e., communicates with the RECs who is coming back and when, notifies the contract unit to release crews, calls outside utilities to notify them when resources have been released, confirms the number acquired equals number released).
- Keeps the sending and receiving REC Logistics Chiefs and Resource Units apprised of resource movement during the demobilization process.

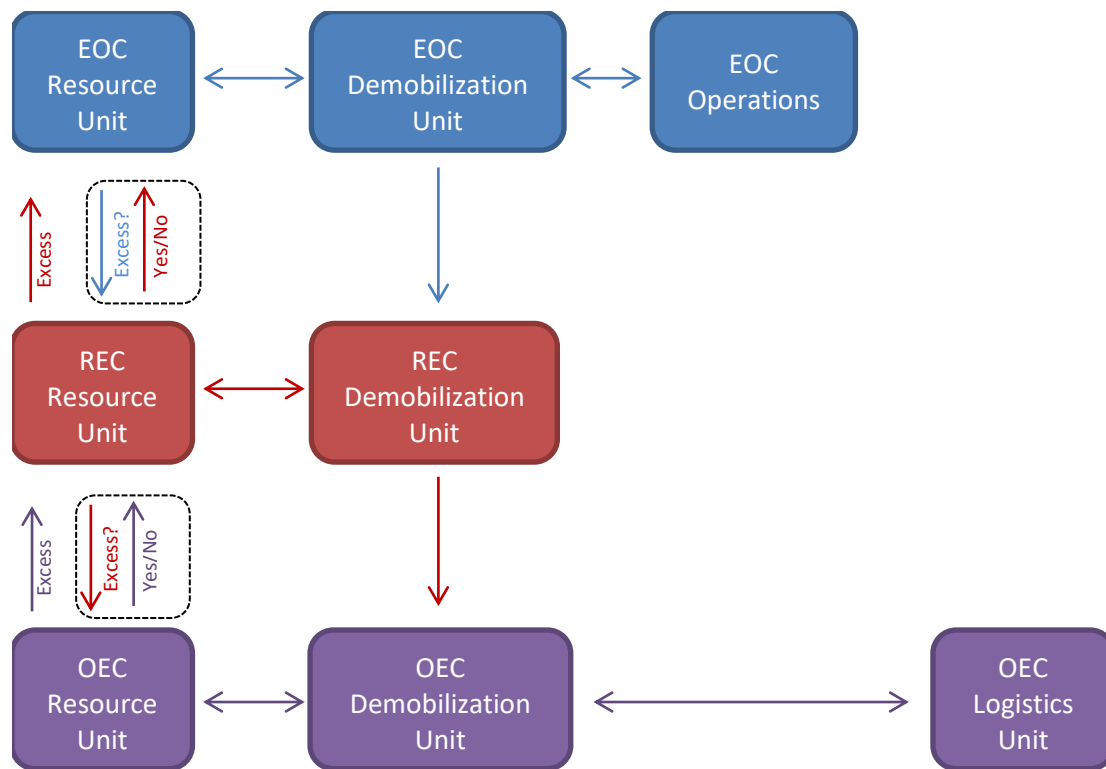
### Emergency Center Commander:

- Approves the demobilization plan for their emergency center.

### Logistics Section:

- Orders and/or restocks supplies/equipment to ensure operational readiness.

Figure 3.9 Example Demobilization Process



#### Example Process for When Excess Resources Are Identified At the OEC<sup>7</sup>

- The OEC Resource Unit identifies excess resources in collaboration with Operations and the Demobilization Unit, informs the OEC Commander, and contacts the REC Resource Unit before approving the demobilization of resources.
- The REC Resource Unit checks to see if the resources can be used elsewhere in the region. If not, it initially checks with the EOC, if activated, to see if the resources are needed elsewhere in the system.
- If the resources are not needed elsewhere, and the EOC provides permission to demobilize resources, the REC Resource Unit informs the OEC Resource Unit that they can demobilize.
- The OEC Resource Unit informs the OEC Demobilization Unit and Logistics of the excess resources.
- The OEC Demobilization Unit communicates with the sending and receiving offices to ensure the safe return of personnel, and Logistics orders and/or restocks supplies/equipment.

<sup>7</sup> For Electric Transmission, the process is the same. For example, excess resources are identified at the DSR and communicated to STOEC, then ETEC, and then the EOC to ensure resources are not needed elsewhere before demobilizing.



### Example Process for When Excess Resources Are Identified In the EOC

- The EOC Resource Unit identifies excess resources system-wide in collaboration with Operations and the Demobilization Unit. It then informs the EOC Commander and contacts the respective REC Resource Unit(s) to confirm if the REC or OECs in its area have excess resources.
- The REC Resource Unit checks to see if the resources referenced by the EOC are considered excess, working with the OEC(s) Resource Unit(s). The REC Resource Unit then reports this finding to the EOC Resource Unit.
- The EOC Resource Unit reconvenes with the EOC Operations and EOC Demobilization Unit, and they make a final decision on which resources to demobilize or reassign. The EOC Commander is also informed.
- If the decision is made to demobilize, the EOC Resource Unit instructs the EOC Demobilization Unit to work with the REC Demobilization Unit(s) to demobilize the selected excess resources.
- The REC Demobilization Unit(s) informs the appropriate OEC Demobilization Unit(s) to work with their respective Logistics sections to coordinate demobilization of the identified excess resources.
- The OEC Demobilization Unit communicates with the sending and receiving offices to ensure the safe return of personnel, and Logistics orders and/or restocks supplies/equipment.

#### 3.2.5.2 System Restoration to Normal Configuration

Following a catastrophic disaster, there may be equipment shortages, and non-standard equipment may be used at first to efficiently restore customers. As much as possible, the system should be brought back in compliance before fully demobilizing.



## 4 Coordination and Communication

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### 4.1 Internal Coordination and Communication

#### 4.1.1 Pre-event reporting

Pre-event summary reporting offers the Emergency Management Director and OEC/REC/EOC Commander an assessment of readiness plans. The report includes crew availability counts, including pre-arranged, normal staffed and call-out resources, as well ICS role staffing lists. Safety tailboards, weather updates and the current DSO SOPP model are included to help pre-planning efforts. Pre-activation checklists provide guidance on the steps required for preparation and activation. Checklists are available at the [Emergency Management Website](#).

#### 4.1.2 Incident Action Plan and Intelligence Summary Reports

The Planning and Intelligence Chief is responsible for the preparation and communication of the report schedule. Reporting schedules to the EOC (Level 3 or Above) will be designed to allow enough time for compiling, analyzing, and summarizing information before reporting to the next level. For details on these reports and links to templates, refer to the CERP. Below is information on some key plans and reports produced in the OEC/REC/EOC.

- The Incident Action Plan (IAP) is an oral or written plan for the next operational period that ensures a common understanding of objectives, communications, resources, etc. and reflects the overall strategy for managing an incident.
- The Intelligence Summary typically includes information on customer impact, damaged equipment or assets, weather and other incident summary information. Upon request, all identified Emergency Centers provide intelligence summaries to the EOC Operations Chief and the P&I Section Chief. The EOC Situation Unit also creates a system-level intelligence summary, at intervals determined by the P&I Section Chief.
- The Situation Unit creates other situation reports, as determined by the P&I Chief.

#### 4.1.3 Event Summary Report

The Event Summary report consolidates pertinent information to provide a succinct review of an emergency event. Distributed across the PG&E organization, the report summarizes the event while providing performance metrics to measure response efforts. Details include a weather summary, safety incidents, environmental risk and compliance, financial cost and reliability metrics including customer outages and minutes. System damage incurred, and significant outages summaries are also provided. This report is distributed by the EOC Commander to PG&E leadership to summarize the event.

## 4.1.4 ETEC Report Spreadsheet

The ETEC Report is created initially by ETEC and updated by both ETEC and STOEC to reflect the status of all transmission outages during an event. The information is summarized and provided to the EOC for inclusion in the EOC Intelligence Summary.

## 4.1.5 Systems Information Management

PG&E uses the following critical software applications during emergencies to manage the electric system and to share information. For technical support information, refer to Appendix C.6.

### 4.1.5.1 Electric Distribution

The following systems are some of the critical applications used in Electric Distribution Operations during emergency events:

- The Outage Management Tool (OMT) is a web-based application that is used by the emergency management organization to gather and report information on customer outages, damage assessments, service restoration, and crew movements in emergency events affecting the PG&E system. Refer to Appendix C.5 for an OMT Job Aid.
- The Field Automation System (FAS) is a software application developed by Ventyx. Work Orders are input by (CC&B, AFW, SAP or OIS) and then sent to FAS. FAS is then used by Electric Restoration Troublemakers, Gas Service Representatives, Field Meter Technicians, Dispatchers and Supervisors to assign, dispatch and complete field work orders.
- DMS is an application designed to assist the control center and field operating personnel to monitor & control the entire distribution network efficiently and reliably. DMS has a network component / connectivity model of the distribution system. It is integrated with Customer Information System (CIS), Geographical Information System (GIS) and Interactive Voice Response System (IVRS). By combining the locations of outage calls from customers with knowledge of the locations of the protection devices (such as circuit breakers) on the network, a rule engine is used to predict the locations of outages. Based on this, restoration activities are charted out and crews are dispatched. This results in improved reliability and quality of service, in terms of reducing outages, minimizing outage time, and providing timely outage communications to our customers.
- SCADA (Supervisory Control and Data Acquisition) allows the operator to analyze and control the electrical system from a remote location.
- SAP is used to track emergency jobs as they move through their life cycle. It is a tool that is used to plan, track, and charge labor and to schedule work. SAP is integrated with FAS, so damaged locations that are assessed by field resources and entered into FAS are automatically sent to SAP.

### 4.1.5.2 Electric Transmission

The following systems are some of the critical applications used in Electric Transmission Operations during emergency events:

- Energy Management System or Transmission Management System (EMS / TMS) is a tool used by system dispatchers and transmission system operators to monitor the Bulk Electric System (BES). EMS has a contingency analysis application that allows for the analysis of the power system in order to identify the overloads and problems that can occur due to a contingency. (A contingency is the failure or loss of an element or a change of state of a device in the power system.) This application uses a computer simulation to evaluate the effects of removing individual elements from a power system. EMS also provides SCADA functions, alarm categories, network study capability, state estimator, and exception reports.
- PI is a data historian tool that allows System Dispatchers, real-time Operations Engineers, and Transmission System Operators to perform load flow analysis, monitor clearances, and view trend data.
- SCADA (Supervisory Control and Data Acquisition) allows the operator to analyze and control the electrical system from a remote location.
- Primate is a real-time mapping tool which uses and reads information from SCADA and TMS. It contains a situational awareness display and operational detail display.
- RMT (Reliability Messaging Tool) is a data messaging system used to convey information related to WECC electrical system elements including, but not limited to: informational 116 notices, outages, emergency and abnormal conditions, as well as restorations. It is used by WECC participating entities, dispatchers and network administrators, and monitored by PG&E's System Dispatchers.
- RAS (Remedial Action Scheme) is a protection scheme designed to detect pre-determined System conditions and automatically take corrective actions that may include, but are not limited to, curtailing or tripping generation or other sources, curtailing or tripping load, or reconfiguring the system.
- TOTL (Transmissions Operations Tracking & Logging) is a web-based electric transmission information management system currently used by CAISO and our System Dispatchers and Transmission System Operators.

## 4.2 External Coordination

### 4.2.1 Customer Strategy and Contact Center

#### 4.2.1.1 Customer Outage Communications

PG&E deploys several methods to communicate with customers when they experience an outage, including via Customer Service Representatives, the PG&E website, social media, Customer Preference and Notification (CPAN) via email, text, or voice message, and Automated IVR telecom systems.

PG&E attempts to provide customers with the following set of details on their specific outage, as soon as they are available:

- **Cause of Outage:** Once an assessment is complete, PG&E assessment personnel provide information on the cause of the outage. This information is available to customers when they call about an outage.
- **Estimated Time of Restoration (ETOR):** ETORs are provided to customers when available. ETORs and their accuracy are important components of customer satisfaction. As such, providing accurate ETORs are a key focus for outage dispatchers, assessment and repair personnel.
- **Estimated Time of Information (ETOI):** During larger events, accurate ETORs may not immediately be available due to the large influx of outages. In these events, PG&E can provide customers with ETOIs that forecast when additional information on their outage will be available.
- **Crew Status:** When available, crew status information can be provided to customers. Statuses such as “Awaiting T-men”, “T-men On-Site”, “Awaiting Crew”, and “Crew On-Site” give customers additional context for the progress of the restoration effort.
- **Other Customer Comments:** T-men and Assessment teams can provide additional comments about an outage to a customer to convey additional information.

When using proactive outage communications via CPAN, the following is communicated:

- Acknowledgement – PG&E is aware your power is out, number of customers affected
- ETA – A crew is on the way
- Cause & ETOR(s) – Cause of the outage, when power will be restored
- Conditional – A new condition may impact your outage
- Restoration – Your power was restored

Accurate and timely customer outage communications are a vital component of improving customer satisfaction, especially during large events.

## 4.2.2 Public Information and Government Coordination

Refer to the Company Emergency Response Plan (CERP) and External Relations Annex for details on how PG&E coordinates public information. The CERP also contains information on how PG&E coordinates with governmental agencies.

## 4.2.3 CAISO Coordination

In Level 1 and 2 emergencies involving electric transmission, System Dispatch is the designated PG&E single point of contact with CAISO. During any outage activity, system dispatch is in constant communication with the ISO and provides them with operational information. System dispatch is also in daily contact with CAISO to monitor power flows and receive clearance requests.

In a Level 2 or greater emergency, the ETEC may be activated to assist System Dispatch with transmission related outages and to facilitate communications with the CAISO's Emergency Operations Center.

During a system-wide capacity event, it is the System Dispatcher's duty to direct the execution of the CAISO's orders. For details, refer to Appendix D for the Electric Emergency Plan (EEP), Section III for Capacity Emergencies.

## 4.2.4 Major Outage Reporting

CPUC General Order No. 166 (G.O. 166), states that a major outage occurs when 10 percent of PG&E's serviceable customers experience a simultaneous, non-momentary interruption of service. A measured event is defined as a major outage resulting from non-earthquake, weather-related causes, affecting between 10% (simultaneous) and 40% (cumulative) of PG&E's customer base. (Refer to G.O. 166 for details on when a measured event begins and ends.)

Per Standard Six of G.O. 166, within one hour of the identification of a major outage or other newsworthy event, PG&E shall notify the CPUC and the Warning Center at Cal OES of the location, possible cause, and expected duration of the outage. For purposes of this standard, PG&E generally treats "newsworthy events" as incidents within the category of Level 3 or greater emergency where the EOC is activated.

For major outages, PG&E may activate its EOC. PG&E's EOC Activation and Deactivation Checklist will be used upon activation of the EOC, including emergency reporting to CPUC, the Cal OES Warning Center, and the CUEA. In addition, PG&E will describe major outages and measured events that occur within the reporting period in its G.O. 166 report to the Commission each year.

Standard Eight of G.O. 166, "Major Outage and Restoration Estimate Communication Standard," states the following:

- Within 4 hours of the identification of a major outage, the utility shall make information available to customers through its call center and notify the media of the major outage, its location, expected duration and cause. The utility shall provide estimates of restoration times as soon as possible following an initial assessment of damage and the establishment of priorities for service restoration.
- Within 4 hours of the initial damage assessment and the establishment of priorities for restoring service, the utility shall make available through its call center and to the media the estimated service restoration times by geographic area. If the utility is unable to estimate a restoration time for a certain area, the utility shall so state.

PG&E has established technology interfaces to allow outage information and restoration times to be made immediately available to customers through the call center's IVR system as soon as troublemen in the field enter the ETOR. The outage information is also supplied automatically to the pge.com website, where customers and the media can secure real-time access information on outages.

In addition, depending on incident complexity, PG&E may conduct targeted outbound calling, live agent calling, door-to-door outreach, and facilitate town hall meetings.

PG&E's Public Information Office coordinates external communications with the media. Following a major outage, the Public Information Office continues to provide outage information to the media. (Refer to the External Relations and the WFM/CCO Annexes for additional details on customer and media communications.)

PG&E includes a description of our compliance with Standard Eight in the annual G.O. 166 report.

## 4.2.5 Other Thresholds for Regulatory Reporting

The following are other thresholds for regulatory reporting:

- IEEE Standard 1366 titled IEEE Guide for Electric Power Distribution Reliability Indices covers the methodology used for calculating thresholds for identifying and adjusting for excludable major event days to evaluate performance of the electric transmission and distribution system.
- Commission Resolution E-4184 covers reporting incidents that result in fatalities, personal injuries, media coverage, and damage to property.
- Electric Emergency Incident and Disturbance Report (Form OE 417) from Department of Energy (DOE)
- NERC Reliability Standard EOP-004-4



## 5 Performance Indicators

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### 5.1 Indicator Evaluation

Performance indicators are used to monitor response and recovery performance during Level 2 or greater emergencies. Key indicators are monitored and evaluated during an event so that actions can be taken to quickly adjust the response plan. Post-event evaluation of indicators is used to improve processes, increase efficiency and revise emergency plans. Some indicators have established measurements while others are subjectively evaluated during the event or during post-event critiques.

### 5.2 Safety and Environmental

**Indicators will be used to:**

- Monitor safety practices and environmental compliance.
- Determine if safety and environmental practices are consistent with established company standards.
- Ensure that hazardous or at-risk environmental conditions reported to PG&E are identified for response.

**Indicator:**

- Employee Injuries or public injuries
- Hazardous Material Spill or Release
- Vehicle Accidents
- Response time to immediate response notifications

### 5.3 Assessment

**Indicators will be used to:**

- Monitor the timeliness of compiling a comprehensive damage assessment.
- Determine resource movement needs.
- Determine restoration forecast.
- Determine the need for Mutual Assistance and Contractor Crews.
- Monitor the timeliness of 911 Agency Relief.

**Indicator:**

- Outage assessment rate
- Appropriate prioritization of outages, to include duration
- Use of non-traditional assessment teams
- Number of standby crews utilized to relieve 911 Agencies

- Number of Mutual Assistance and Contractor resources

## 5.4 Internal and External Communications

### Indicators will be used to:

- Ensure that timely and consistent information is being communicated to internal and external entities
- Gauge the quality of outage information reported to our customers.

### Indicator:

- Contact Center Average Speed of Answer (ASA)
- IVR Take Rate performance
- Estimated Time of Restoration (ETOR) Accuracy
- ETOR Timeliness
- Number of ETOR updates
- Outage Basic 5 Information (five basic pieces of information to complete in OMT— materials, estimated repair time (ERT), ETA or ETOR, customer comments, and cause)

## 5.5 Restoration

### Indicators will be used to:

- Monitor the timeliness of customer restoration.
- Evaluate the effectiveness of resource management.
- Monitor forecast vs. actual restoration times.

### Indicator:

- Customer restoration times
- Critical Transmission Line restored against forecast
- Outage restoration rate against forecast
- Number of customers experiencing extended duration outages

## 5.6 Reliability Metrics

### Customer Average Interruption Duration Index (CAIDI)

Number of customer minutes of interruption divided by the total number of customers interrupted

### System Average Interruption Duration Index (SAIDI)

SAIDI is the sum of all customer interruption duration divided by the number of customers served.

### **System Average Interruption Frequency Index (SAIFI)**

SAIFI is the number of customer interruptions divided by the number of customers served.

### **Momentary Average Interruption Frequency Index (MAIFI)**

MAIFI is the total number of customer momentary interruptions divided by the number of customers served.

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## 6 Training and Exercises

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### 6.1 Electric Transmission Training and Exercise Program

Electric Transmission Operations department is responsible for annually conducting an EEP (Electric Emergency Plan) exercise with Transmission and Distribution (T&D) departments, other departments identified in the EEP, and the CAISO.

Transmission System Operations also conducts:

- Two restoration training exercises annually—a system-wide exercise and a smaller area-specific exercise.
- Four capacity exercises annually—a system-wide exercise, as well as three exercises for smaller localized areas of concern.
- Transfers of control from Vacaville (primary location) to Rocklin (back up) to ensure Grid Control Center (GCC) System Dispatcher has executed the process each year.
- Four or five, six-week sessions of continuing education hours for System Dispatchers, to comply with NERC regulations and to maintain NERC Certification.

### 6.2 Electric Distribution Training Program

The Sr. Manager of Emergency Restoration is responsible for maintaining an ongoing training program for Electric EMO personnel. The intent of the program is to ensure understanding of emergency response procedures and practices. Position-based training and use of technology are key focus areas of the training program. The use of ICS is emphasized in the training program to ensure an effective overall response and alignment with public agencies.

Each Sr. Director and Superintendent responsible for emergency planning and response is also responsible for ensuring that personnel identified in emergency plans are trained annually and that the training is documented. Sr. Directors and superintendents with emergency response roles are expected to maintain adequate workforce redundancy for each emergency response position. Cross-training of new or less experienced personnel in various emergency roles, and the involvement of less experienced personnel in emergency exercises and events, facilitates the development of an adequate emergency response workforce.

Based upon the assigned emergency role, employee training should include some, or all, of the following:

- CERP and Electric Annex
- Role-based Training
- Outage Management Tool
- Event Strategy Workshops
- Technology Down Processes

- Standby Training
- ICS CBTs 100 and 200
- Instructor-led classes ICS 300 and 400
- Emergency Management SharePoint
- ARCOS Crew Manager
- Clerical Support
- Assessment, Repair, and Restore Process and Procedures

## 6.3 Electric Distribution Exercise Program

The Sr. Manager of Emergency Restoration is responsible for scheduling, conducting, and evaluating the required exercises. Exercises are intended to examine the effectiveness of the emergency plans. Performance will be evaluated against established objectives and processes. Gaps identified during the exercises must be documented. Actions to close gaps must be tracked to completion.

### 6.3.1 Testing of Plan

Company policy and the California Public Utilities Commission (CPUC) General Order 166 require annual exercises with appropriate departments and public agencies based on simulated emergency events. This requirement can be waived in lieu of an actual event dependent upon the event's scope and structure. The Electric Operations Emergency Management Department oversees and manages the testing of the Electric Annex. The documentation of training and exercises are submitted to EP&R to facilitate alignment of response processes and procedures across the enterprise and included in the annual G.O. 166 filing.

### 6.3.2 Quarterly Exercise Requirements

The Sr. Manager of Emergency Restoration recommends quarterly region-based exercises. This requirement acknowledges that at a minimum, one Region Emergency Center may exercise its plan and/or one facet of that plan each quarter (e.g., an OEC's overall operations is exercised one quarter and then the dispatch process is exercised the following quarter). A tabletop exercise can fulfill the quarterly exercise requirement. It is prudent to exercise each Region's Emergency Center (REC, OEC, and DSR) and their critical processes (e.g., Dispatching T-man and Assessment Crews) often enough to ensure that the participants are proficient in their roles and responsibilities. The quarterly exercise policy can be waived if there has been an actual incident and agreement has been reached with the Region Sr. Director and the Sr. Manager of Emergency Restoration.

## 7 After-Action Reports, Unit Logs, and Records

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After-action reviews are to be conducted by each emergency center within 20 business days of deactivation of the center for all activations meeting the criteria outlined in EMER-4510S, "Operations Emergency Center (OEC) Activation Requirements".

### 7.1 Preparation for Formal After-Action Reviews

Emergency centers may conduct separate after-action reviews in preparation for the formal after-action meeting. For example, control centers and district storm rooms (DSRs) may perform their own after-action reviews following an event. The frontline supervisors will lead the Control Center and DSR critiques. These emergency centers will send a point of contact to represent their findings during the formal after-action review meeting.

### 7.2 Emergency Center After-Action Review Plans

Emergency centers identify corrective actions, assign action item leads, and designate due dates. These action items are entered into the Corrective Action Program (CAP). REC Strengths and opportunities identified during after action reviews will be communicated to the affected EMO stakeholders for future reference. Significant strengths will be communicated to the Director of Emergency Management for incorporation into future and will be shared system-wide as "Best Practices" by the emergency management specialists. Improvement opportunities will be addressed in a prioritized manner.

### 7.3 ICS 214 Unit Log

All positions in the emergency centers are responsible to maintain an ICS 214 Unit Log to document aspects of the restoration effort. This will include the date and time of key activities, decisions, contacts made, and similar topics. Completed logs shall be archived in accordance with the company's policies for record retention.

### 7.4 Record Keeping

All departments and headquarters, as outlined throughout this plan, shall follow Emergency Operations reporting procedures and record keeping. Documentation of all significant events is required to effectively document response and restoration efforts. Local IAPs will be archived on a shared drive/SharePoint site as determined by the Sr. Manager of Emergency Restoration. In addition, established PG&E requirements governing reporting, record keeping and record retention will be observed. Records will assist in developing post-event critiques and the Event Summary Report, which will be used to document and continuously improve the emergency response and restoration process.

### 7.5 Financial Considerations and Financial Records

The Finance and Administration Chief in the OEC, in conjunction with the Emergency Recovery Program Manager, shall monitor that all time and related expenses are properly captured and recorded to each appropriate Plant Maintenance (PM) Event Order designated to cover the emergency event, and based on the current emergency recovery



accounting guidelines. Also, the Finance and Administration Chief in the OEC shall track and maintain records of expenses associated with response and restoration. (Refer to PG&E's records retention policy for more details.)

## Appendix A. Glossary and Acronyms

### A.1 PG&E Standard Glossary

Refer to the PG&E Standard Glossary in the Company Emergency Response Plan (CERP).

### A.2 Acronyms

The following chart includes electric operations acronyms in this Annex that are not included in the PG&E System Acronym list.

**Table 7.1 Electric Operations Acronyms**

Acronym	Definition
CAIDI	Customer Average Interruption Duration Index
ERT	Estimated Repair Time
ETA	Estimated Time of Arrival
MAIFI	Momentary Average Interruption Frequency Index
RMT	Resource Management Tool
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SOPP	Storm Outage Prediction Project

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## Appendix B. Contact/Notification Lists

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### B.1 Emergency Response Personnel Contact Lists

- On Call Lists for REC/OEC personnel are located on the Emergency Management Website under “Contacts” and “On Call Schedules” located [here](#).
- [On Call list for EOC members](#)
- Transmission Operations Contact Lists are located on [SharePoint](#).

### B.2 Additional Lists

The following lists are also located in the Emergency Management Website:

- The County OES Contact List and contact information for the emergency centers are located [here](#) (under contacts)

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## Appendix C. Tools, Job Aids, Training Aids, and Other Reference Materials

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### C.1 Emergency Center Activation Checklist

Click on the following links to view the checklists. Then for the OEC, REC, and EOC Activation/Deactivation Checklists, click on the Activation link or folder.

- [EOC, REC, OEC Activation and Deactivation Checklists](#)
- Unplanned Event 96-Hour OEC/REC Checklist  
<http://pgeweb/electric/emergency/Pages/CheckLists.aspx>

### C.2 Electric Distribution Emergency Center Locations

Emergency center, alternate locations, and contact information is located at the following link under Contacts.

<http://pgeweb/electric/emergency/Pages/default.aspx>

### C.3 Electric Conference Call Agendas for Activation

- **EOC Pre-Event, Planning, Tactics and Logistics Meeting Agendas:** Click <http://wss/EO/sites/EP/EOC/PI%20Documentation%20Unit/Forms/AllItems.aspx>, then select Section Chief Meeting Agendas.
- **REC/OEC Meeting Agendas:** <https://SPs.utility.pge.com/sites/EOEP/MEETINGSCRIPTS/FORMS/ALLITEMS.ASPX>

### C.4 After-Action Report Template and Instructions

<http://pgeweb.utility.pge.com/electric/emergency/Documents/Forms/AllItems.aspx?RootFolder=%2felectric%2femergency%2fDocuments%2fAfter%20Action%20Reviews&FolderCTID=%7bACB33758%2d995B%2d4B2B%2d9FF2%2d35A48680D371%7d>

### C.5 Outage Management Tool (OMT) Job Aids

The Outage Management Tool (OMT) is a web-based application that is used by the emergency management organization to gather and report information on customer outages, damage assessments, service restoration, and crew movements in emergency events affecting the PG&E system.

The OMT Overview Job Aid at the following link provides information on all the reports and tools available in OMT, system requirements, login, and technical support information. Detailed job aids on OMT are also provided at the link below.

<https://sps.utility.pge.com/sites/EOEP/EP%20Job%20Aids/Forms/AllItems.aspx>

## C.6 Technical Support

- For FAS or DMS Support, contact the TSC at 415-973-9000, PG&E Line at 8-223-9000. The TSC Analyst will then contact the On Call DMS Admin.
- For EMS, PI, and Primate, contact the TSO-Operations Systems-EMS Team.
- For SCADA, contact the SCADA team.
- For WECCNet, contact WECC.
- For RAS, contact the TSO-Operations Systems-RAS Group.
- For SLIC and E-SLIC, contact IT or TSO-Training.
- For OMT issues related to OMT installation and setup and OMT Tech Down contact:  
Normal Work Hours
  - Primary contact - Technology Service Center (TSC)
  - Secondary contact - Local Emergency Management Specialist (EMS)
- After Work Hours and Weekends
  - Primary contact - Telecommunications Control Center (TCC)
  - Secondary contact - Technology Service Center (TSC)
- For OMT issues related to creating, modifying or removing OMT User Accounts, formal OMT Training, Operational Support, ideas, suggestions and general inquiries, contact your local EMS.

## C.7 ICS, Planning Process, and Key CERP Job Aids

Refer to the Company Emergency Response Plan (CERP) for additional details and job aids for the following:

- Incident Command System (ICS)
- Planning Process
- Three-Way Communication
- Phonetic Alphabet

<http://pgeweb.utility.pge.com/guidance/pages/EmergencyResponse.aspx>.utility.pge.com/guidance/pages/EmergencyResponse.aspx

## C.8 Position Checklists

ICS position checklists for Command and General Staff are located at the following under OEC Positions and Tools:

<http://pgeweb.utility.pge.com/electric/emergency/Pages/default.aspx>



## Appendix D. Electric Emergency Plan (EEP) For Capacity Emergencies

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The California Independent System Operator (CAISO) operates the state's transmission grid. When it is determined that operating reserves are inadequate to meet the Western Electricity Coordinating Council (WECC) Standards, the CAISO initiates actions to address the imbalance between available system resources and system demand.

The Electric Emergency Plan (EEP) for Capacity Emergencies describes the actions PG&E will take upon receiving orders from the CAISO to address electric supply and/or capacity shortages. This plan is located at:

<https://sps.utility.pge.com/sites/eep/SHARED%20DOCUMENTS/FORMS/ALLITEMS.ASPX>