

***Case Study:***  
***Pacific Gas & Electric Company***  
**San Francisco Lifelines Council**

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## Today's Presentation from PG&E

### Coordinate with the Lifelines Council to:

- Lifelines Partnership Opportunities
- Design System Standards
- Emergency Planning and Response Activities



## **PG&E's Coordination Goals with the Lifelines Council**

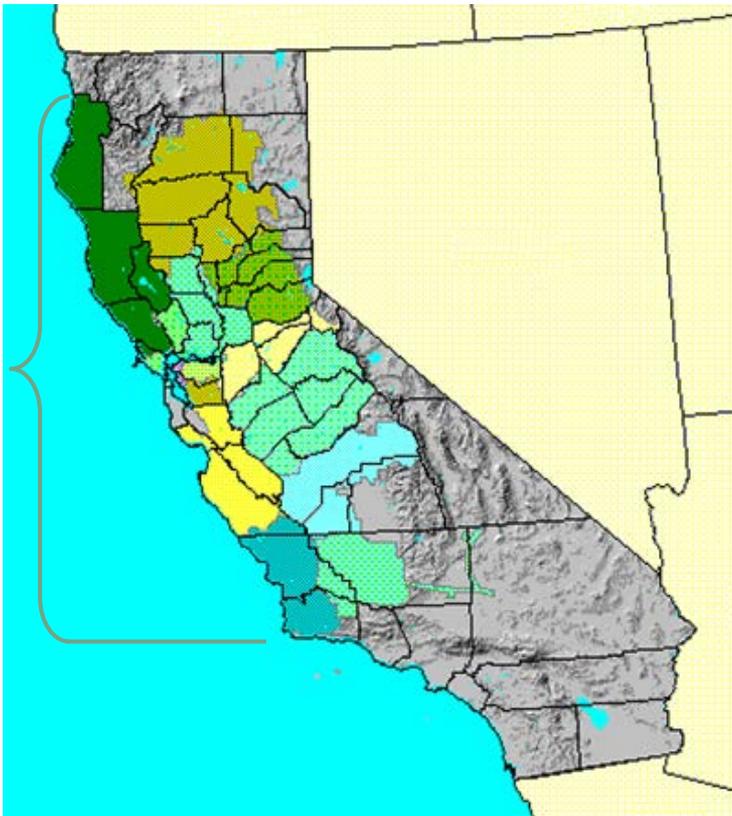
### **Coordinate with the Lifelines Council to:**

- Establish response and recovery priorities
- Facilitate Mutual Logistics Support
- Enhance Effective Communication

**Formal acknowledgement that PG&E is a first responder organization**

**Identify restoration priorities regarding non-PG&E facilities for immediate electric/gas service**

## *System Map and Customers Served*



### **PG&E Facts Regarding Customers Served in California**

- 70,000 Square Miles
- 15 Million People Served
- 4.2 Million Gas Customers
- 5.1 Million Electric Customers
- 3,400 Buildings



# *Earthquake Risk Management Program*



**“Each utility shall withstand earthquakes to provide protection of life, limit damage to property, and provide for resumption of utility service in a reasonable and timely manner.” California Seismic Safety Commission/CPUC Safety Branch**

## **Federal and State Standards**

- **Federal Energy Regulatory Commission (FERC)**
- **Nuclear Regulator Commission (NRC)**
- **CPUC General Orders**

## **Design Standards (Examples)**

- **Department of Transportation (DOT)**
- **2007 California Building Code**
- **Existing Building Retrofit Standards and Compliance**

## **Seismic Risk Management Approach**

- **Evaluate Facilities and Operations**
- **Prioritize Selected Facilities for Mitigation**
- **Implement Mitigation**
- **Minimize Level of Earthquake Risk**

## 245 Market Street



# Moss Landing 500kV Switchyard Damage to Live Tank Circuit Breakers 1989 Loma Prieta Earthquake



# Improving PG&E's System Performance



Seismic Tests on Replacement Breakers



Gas Pipeline Replacement Program (GPRP)



## **PG&E Seismic Investments (1985 to Present)**

### **Facilities**

- **Buildings**
- **Electric Substations**
- **Dams and Related Hydro Facilities**
- **Power Plants**
- **Gas T&D**
- **Loma Prieta Repairs**

**TOTAL BUDGET                      \$2.54 Billion (estimate)**

# Improving PG&E's System Performance



Vacaville Grid Control Center

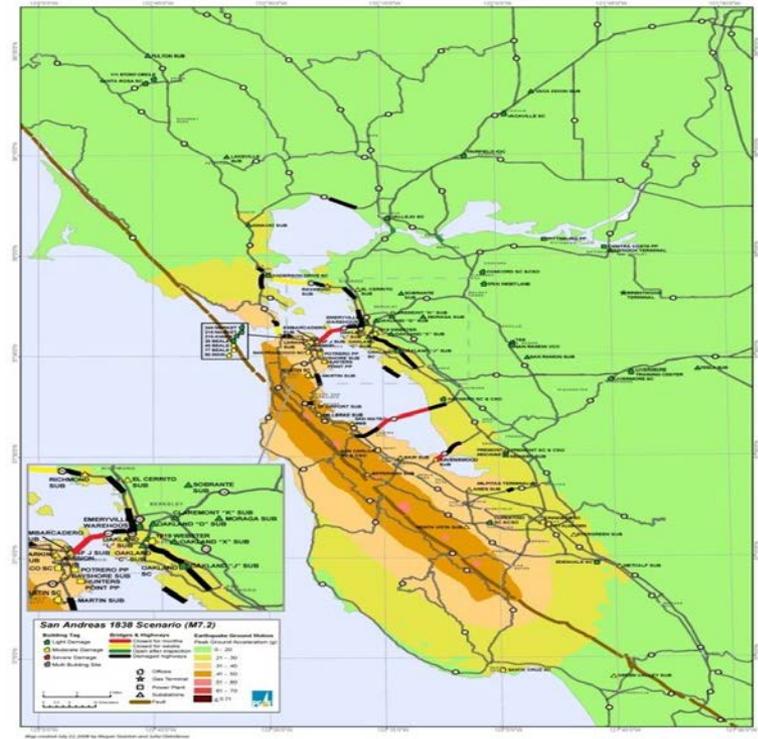
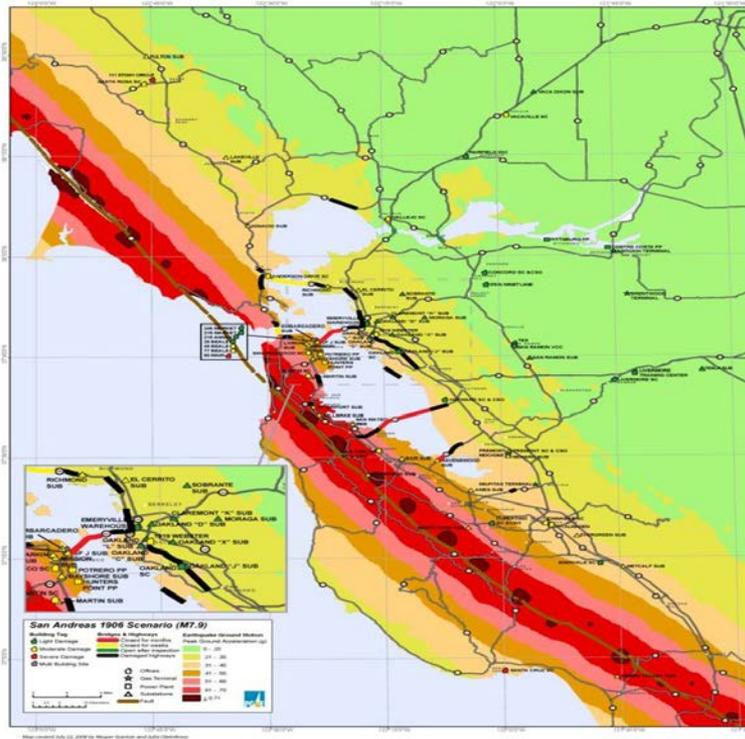


Iso-Base



# Post-Earthquake Emergency Response and Restoration Management and Coordination

# Post-Earthquake Response Scenarios “Expected” and “Extreme” Earthquakes



## **Post-Earthquake Assessment**

- **Strong Motion Instrument Program**
- **Post-Earthquake Building Inspection**
- **Gas and Electric Emergency Response Programs**
- **GIS**
- **USGS Shake Maps**
- **Dam Information Automated Seismic Hazard Assessment**

## **PG&E's Emergency Planning and Response Activities**

- **Primary and Alternate Emergency Operations Centers**
- **ICS/NIMS Incident Management**
- **Formalized Business Continuity Program – alternate headquarters, “tech down” plans, disaster recovery and resource recovery plans**
- **Integrated Training and Exercises with Federal, State, and Regional Agencies Including CCSF SFFD and Department of Emergency Management (DEM)**
- **California Utility Emergency Association (CUEA)**

# Emergency Operations Center (EOC)



## **Lifelines Comparison—Dependencies**

### **What are PG&E's Dependencies?**

- Communications
- Transportation
- Public Safety
- Emergency Medical Services

### **Who's Dependent on PG&E?**

- All other utilities
- All 18 Emergency Support Functions  
(includes most city and county services)
- Businesses
- Residences

## **Service Area Overview**

- **PG&E's gas and electric network is interconnected throughout our service area.**
- **Restoration of lifelines in the San Francisco Bay Area will be impacted by the condition and capacity of the larger network after a major event.**

## **So What Can Residents Expect?**

- **Minimum of 72 hours electric service interruption in red and orange areas of the Shake maps.**
- **Longer electric service restoration times where underground utilities are subject to liquefaction.**
- **Potentially weeks and months of gas service interruption in red and orange areas of the shake maps.**



# Questions and Answers

# Thank You

