



OEMA 2016 Conference



THE 1989 LOMA PRIETA EARTHQUAKE: LESSONS FOR TODAY

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Why study LP here? Now?

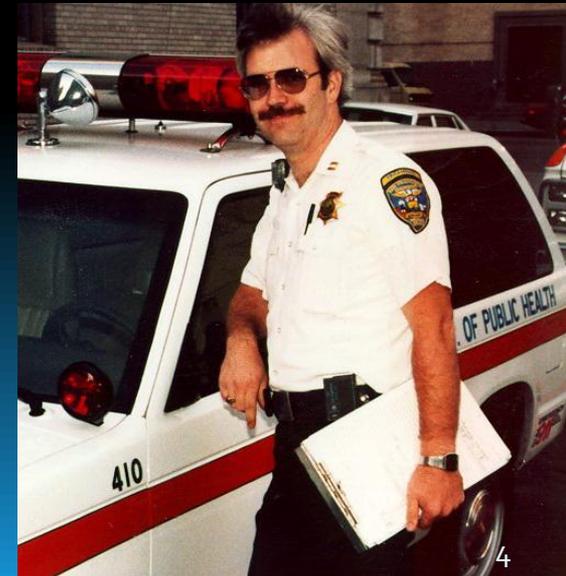


Today's program

- Scope: SF Bay Area & Monterey Bay Area
- Video: "The Quake of 89" KRON TV
- Personal lessons learned at the time and refined ever since
- Cascadia-specific perspectives
- Q&A

Larry's background

- 1989: Paramedic Captain, San Francisco DPH Paramedic Division
- 2001-2013
 - Regional & county EM coordinator
- 2014-present
 - EM coordinator, City of Medford



The setting: Oct. 17, 1989



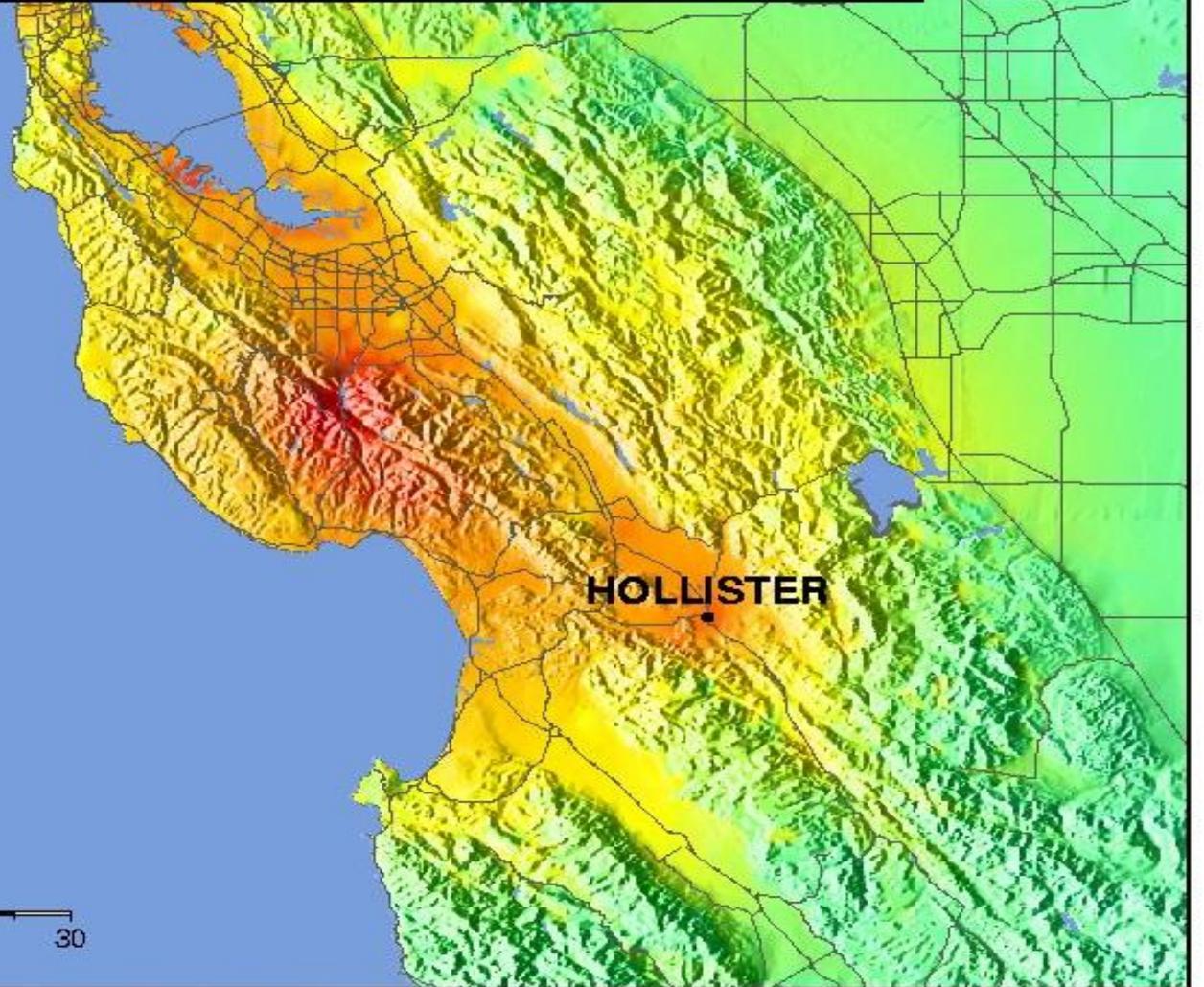
Park Emergency Hospital circa 1902

Liquefaction susceptibility



5:04 PM

USGS/UCB/CGS ShakeMap: Magnitude 6.9



SHAKING: WEAK STRONG SEVERE

Immediate impacts

- Structural collapses
 - Unreinforced masonry (URM) construction
 - Wood frame with “soft” first story
 - I-80 Cypress Structure
 - Oakland-San Francisco Bay Bridge
- Power outages
- Telephone outages
- Nonstructural damage









Photo credit: Stanford University

Video discussion points

- Suddenness of onset
- Behaviors of ground & structures
- Behaviors of people from Day 1 to Day 3
- Spontaneous/emergent volunteers
- Statements by officials

Video available for streaming at:

<https://diva.sfsu.edu/collections/sfbatv/bundles/189054>

Delayed effects

- Ignition of gas leaks
- Hydrant system failure
- Crucial presence of SFFD fire boat





Photo credit: dasilvaphoto.com



Photo credit: Margo McGrath

Response challenges

- Technology disruptions
- Spontaneous/emergent volunteers
- Mission narrowing
- Demand in excess of available services
- Inadequate EOC
- Inadequate/rigid response plans
- Communications challenges
- Inadequate planning for PAFN

Technology disruptions

- Power failure consequences
 - Failure of all traffic signals
 - Inability to pump fuel
 - Limited duration generator operation
 - Radio communications became unreliable
 - Hospital generator failure
 - EMS Communications computer failure
- Adaptations and corrective measures

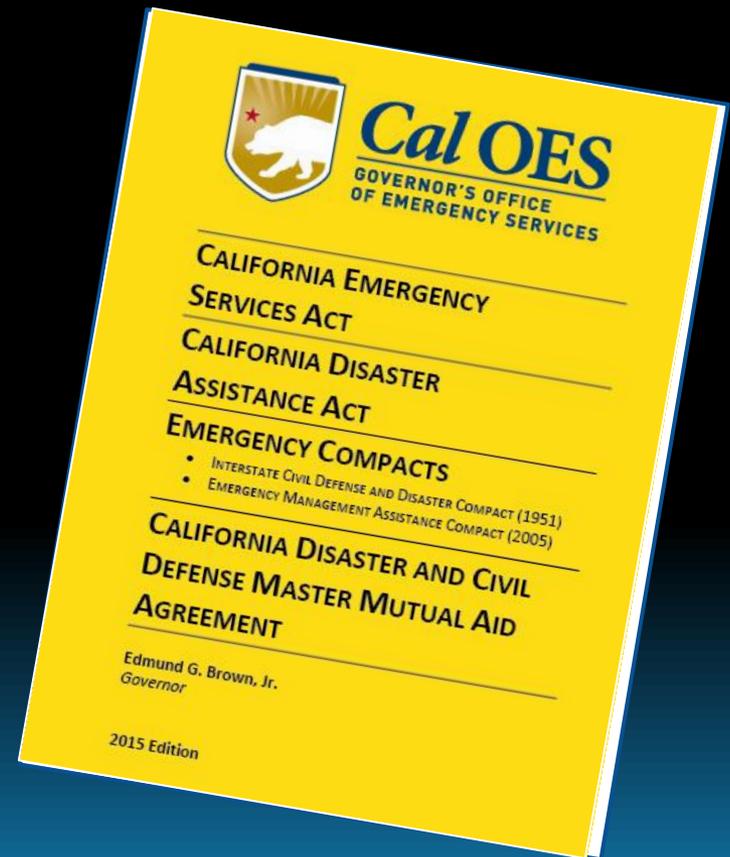
Spontaneous volunteers

- Conducted highly risky activities
- Essentially unmanaged & undirected
- Corrective actions:
 - Aggressive volunteer programs initiated
 - Stockpiles of safety equipment
 - Improved application of Disaster Service Worker statutes



CA Emergency Services Act

- “...all public employees are hereby declared to be disaster service workers subject to such disaster service activities as may be assigned to them by their superiors or by law.” CGC §3100



Available at www.caloes.ca.gov

Volunteers “impressed into service”

“Volunteers... duly impressed into service during a[n]...emergency, in carrying out... any order... or performing any of their authorized functions or duties or training for the performance of their authorized functions or duties, shall have the same degree of responsibility for their actions and enjoy the same immunities as officers and employees of the state and its political subdivisions performing similar work.”
CGC §8657

Available at www.caloes.ca.gov

Mission narrowing

- Opting for favored activities vs. essential response actions
- Corrective actions:
 - Clear policy
 - Articulate expectations in plans
 - Training, especially managers

Excess demand

- Inevitable in a disaster
 - Single emergency message
 - SFFD call volume: 500/hour 1800-0000

- Corrective actions:
 - Plan, equip, & supply
 - Personnel recall plans, including automatic
 - Identify, train, & exercise support staff
 - Plan for effective use of volunteers, including emergent
 - Current agreements and relationships
 - Flexibility in plans & policies
 - Emphasize personal and family preparedness for all staff to maximize availability

Inadequate EOC

- Working space
- Redundant communications
- Visual display of vital information
- Familiar to EOC staff
- Security & access control

Inadequate EOC (2)

- Corrective actions:
 - Build/convert an adequate physical space
 - Equip & supply for effective sustained operations
 - Anticipate technology disruptions
 - Train and exercise EOC staff
 - Manage security and access

SF EOC (current)



Photo credit: CalFire

Inadequate/rigid plans

- Out of date
- Unrealistic assessment or expectations
- Inadequate resource information
 - Internal
 - External
- Too rigid to allow discretionary actions

Inadequate/rigid plans

- Corrective actions:
 - Use sound plan development practices
 - Implement and honor a maintenance schedule
 - Be brutally honest in all areas
 - Be creative in identifying resources during plan development and maintenance
 - Provide adequate flexibility to respond to whatever issues emerge

Communications challenges

- Technical
- Personal
- Both may degrade in a major emergency

“Communication without intelligence is noise; intelligence without communication is irrelevant” --Gen. Albert Gray, USMC

Communications challenges

- Corrective actions:
 - Count on technology failures
 - Plan for robust redundancies, including low/no tech
 - Train and exercise for failures of primary and secondary systems
 - Plan for overwhelming demand
 - Keep procedures simple, e.g. clear text

PAFN challenges

- Virtually no systemic plan in place
- Corrective actions:
 - Aggressive planning emphasis
 - Highly effective registry established
 - Comprehensive community outreach

On plans:

“Planning is worthless; the planning process is indispensable” --General Dwight D. Eisenhower

“Everyone has a plan until they get punched in the face” --Mike Tyson

The lesson: *Have good plans and use them. Recognize their limitations. Train and exercise to the plans.*

On facilities:

- Have backup facilities and backups to those.
 - Can you operate in a school gym?
 - Can you operate mobile?
 - Can you operate in a tent?
- What is your operational endurance in each?
 - How does that change when the supply chain is “toast”?
- Plan, train, and exercise for those facilities & conditions

On the tough decisions

- Be prepared to triage all manner of response strategies
 - Public services
 - Support for response and recovery personnel
- Enlist fellow decision-makers you respect
- Anticipate fallout from leadership, media, public at large



On maximizing your people

- Prepare to support responder & staff families
- Consider remote/home-based work where possible
- Plan for sheltering, childcare, animal care, other services for essential personnel
- Plan to use able family members in those roles, when and where appropriate
- Emphasize family preparedness

On senior leadership

- Train your elected officials on their roles and limitations
- Enlist their support in preparedness activities
- Train and enlist your “non-emergency” managers
- Establish relevant relationships between those in your jurisdiction and others
- Consider delivering FEMA’s ICS 402

On the role of the EM

Most of us are hired for our subject matter expertise, when in fact the successful EM should probably be equal parts SME and evangelist.

It isn't enough to just deliver a sound message, we must make *believers* of our flocks.

On resilience



EXTRA EXTRA EXTRA

San Francisco Chronicle

1989 Year No. 236 ***** WEDNESDAY, OCTOBER 18, 1989 41A-77E, L1111 25 CENTS

HUNDREDS DEAD IN HUGE QUAKE



The three-story apartment house on Beach and Divisadero streets lay broken in the rubble on the bay. Smoke filled the air in the background.

The Experts' Advice on How to Cope

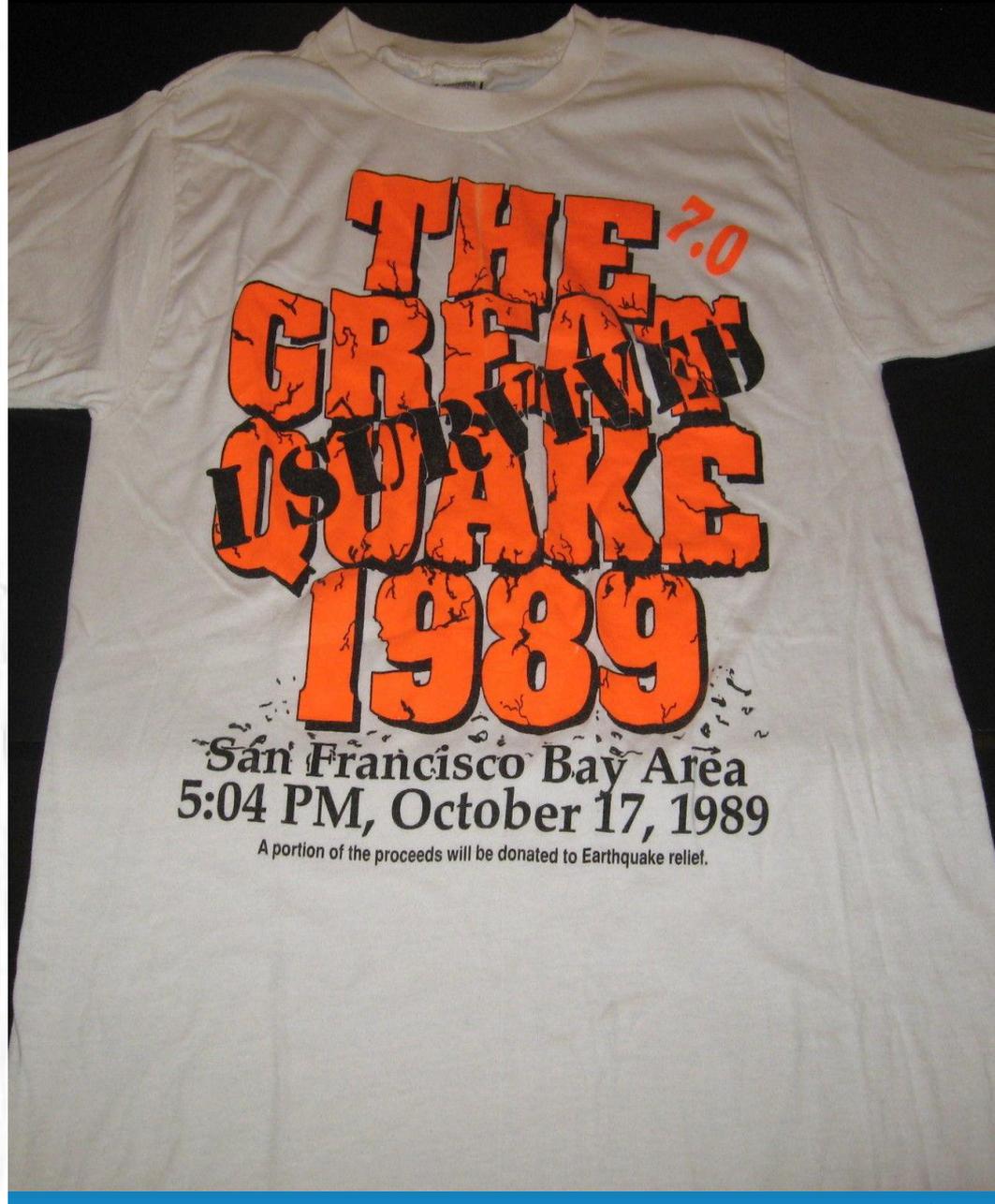
By Edward Symon, Chronicle Staff Writer
As a stressed Bay Area...
The advice from government...
Bill Boardman added that...
San Francisco should not...
Page 4, Col 1



The top level of the I-880 freeway at Cypress Street in Oakland fell into the lower roadway.

Oakland Freeway Collapses — Bay Bridge Section Fails

By Henry Dinkler and Susan Stone, Chronicle Staff Writers
A terrifying earthquake ripped through Northern California late yesterday afternoon...
The quake was the strongest since the destruction of the great 1906 quake...
The section around from the...
Last night, San Francisco...
San Francisco should not...
Page 4, Col 2



The numbers

- Fatalities: 67 (42 on I-880)
- Injuries: 3,757
- Homeless: 12,000
- Fires: 30
- Cost: 8-10 Billion



How Cascadia could compare

- 20 times the duration (15 sec. v 5 min. +)
- 900+ times the energy release

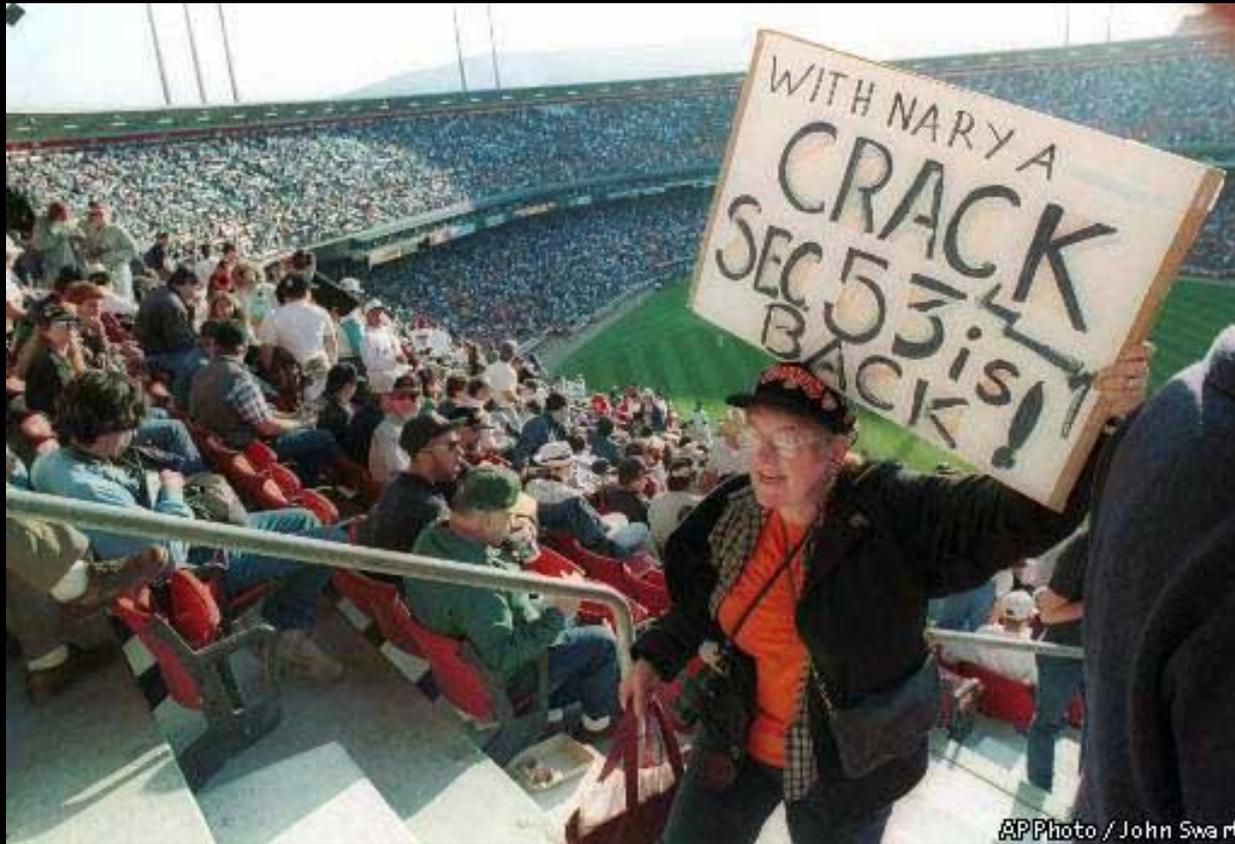


So... how ready *are* we?

1. Ask yourself
2. Ask your leadership
3. Ask your communities

“With commitment all things are possible.
Without it, nothing else matters.”

--Yoram Klein, MD



Day 10

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