Disaster Communications
Topics from Incidents

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Communication Topics from Incidents

What happens on the days after

- Turkey earthquake
  - California buildings at risk, too
- Learnings from recent California earthquakes
- Local ARES deployments from Dec/Jan floods
- California's Great Flood of 1862
- Austin communication issues with power outage

Turkey Earthquake: Amateur Radio Participation

- Aziz, TA1E, coordinated frequencies for search teams.
- Only countries that sent Search and Rescue resources with embedded amateur radio operators were:
  - Georgia
  - Bosnia and Herzegovina.
  - Romanian SAR team had no operators, but it did have communications equipment
- Due to the overwhelming dimension of the incident, some problems in S&R and frequency coordination occurred.
  - Duty assignment areas are sometimes last-minute decisions by government officials
  - Groups with assignments report to Aziz who will inform them of the usable frequencies
  - With the large number of rescue teams, the challenges in coordinating teams, locations, and frequencies are to be expected.
- Focus is on getting the right help to the right places.

Turkey Earthquake: Amateur Radio Participation

- Assistance of foreign radio amateurs is permissible only if they are embedded to S&R Teams with International Search and Rescue Advisory Group (INSARAG) Certification.
- Turkish amateur radio operators deployed.
- Traffic heard on 10 and 80 meters in the Turkish language, so the request to keep frequencies in the area clear remains.
- Most of the emergency communications traffic remains on VHF.

Turkey Earthquake: Amateur Radio Observations

- Setting up regional/city bands and frequencies on the fly from national level
  - Disaster area = size of Wisconsin
  - Because frequency requests are spontaneous and geographically scattered, difficult to avoid frequency conflicts
- Not mentioned was challenge of translating foreign radio reports into Turkish.
- Amateur Radio credential of foreign S&R teams:
  - International Search and Rescue Advisory Group (INSARAG) Certification
- Local net controls on VHF
  - How are messages on 10 and 80 meters being captured and made actionable?
- Challenge of keeping radio batteries charged

Deadly building flaw common in California brings destruction to Turkey

- A significant cause of Turkey destruction involved building design common in California.
  - Flaw of non-ductile concrete construction
- Concrete frame buildings were popular after World War II. Their lethal flaws became evident during the 1971 Sylmar earthquake
  - Newly-built Olive View Medical Center was heavily damaged when the five-story hospital lurched sideways when some of its first-floor columns broke.
- Geological Survey said a magnitude 7.8 earthquake in Southern California could cause 50 non-ductile concrete buildings to fully or partly collapse, with as many as 7,500 people in them.
- There are many thousands of these buildings throughout California
- These buildings have shown vulnerabilities in quakes around the globe for half a century.

Northridge: consequences of earthquake damage

- Water: In some areas, water was out for a week.
  - Impossible to use flush toilets.
  - People dug pit toilets near their homes or in parks.
  - Cities placed porta potties in key locations.
  - National Guard distributed water from a tanker truck. People filled bottles and buckets. A soldier with rifle kept people from cutting in line.
- Schools: Took one week for engineers to inspect all schools.
- Transportation: in cities and on freeways was hindered by collapsed or damaged bridges and earthquake debris on streets.
- Housing: After the quake, and a 6.0 aftershock, people were afraid to go back inside their homes.
  - Many camped outside on their properties or in parks and playgrounds

Loma Prieta media mis-information

- Media coverage of Marina fire made it seem about half the city was ablaze.
  - It was actually just a few buildings, but the camera angles distorted the coverage.
- TV news program showed collapsed San Francisco overpass on 101.
  - However, the picture was from the 1971 Sylmar earthquake in Southern California.
- The news reported runways at SFO were extensively damaged.
  - They were not. Inbound and outbound flights operated on schedule.
- The media publicized the figure of 273 dead.
  - The total was actually 63.
- Their reports gave the impression the quake was as bad as the one in 1906.
- The media neglected or ignored Watsonville and Santa Cruz where thousands of people had been made homeless.

Loma Prieta: Marina District Example

- Deputy Fire Chief viewed Marina fire on TV
  - Noticed no Fire resources
- He raced there and learned hydrants were dry—pipes broken
- Broken natural gas lines feeding fire
- Called for S.F.'s back up water plan: Fire boat *Phoenix*
  - Pumped 5.5 million of gallons of water over 12 hours
- Boat docked at Marina Green
  - Needed to run hose 3,000 feet from boat to fire
- Fire Lieutenant went to Staging Area (sports bar) and recruited 200 SUVs to lay the hose.
- "Saved the Marina District"
- Improvise, adapt and overcome

Loma Prieta and San Francisco

- “Communication was biggest problem”
  - 911 service overwhelmed
  - Calls not being answered
  - Hindered optimal allocation of Fire and Medical resources
- Why was a Deputy Fire Chief watching TV 30 minutes after quake?
- Power went out at Candlestick Park—P.A. system down
- Media mis-information

San Fernando Earthquake

- Before quake, an inter-hospital radio-based system established
- HEAR: Hospital Emergency Administration Radio
  - Short wave band
  - 110 hospitals
- VA hospitals not part of HEAR
- Hospitals connected to HEAR could dispatch doctors and nurses to where they were immediately needed
- Hospitals used HEAR to report number of empty beds
- Law and Fire not connected to HEAR
  - Their response to quake delayed because phone lines went down

San Fernando Earthquake

- HEAR morphed to become VMED28
- Frequencies
  - 460 to 464 MHZ
  - 12 repeaters for wide-area coverage
- Medical Alert Center (MAC) is a 24/7 communication center operated by LACOEM
  - Provides communication monitoring,
  - Provides relay information to hospitals
  - Would be the primary notification center for any events requiring medical resources outside the normal operating channels.

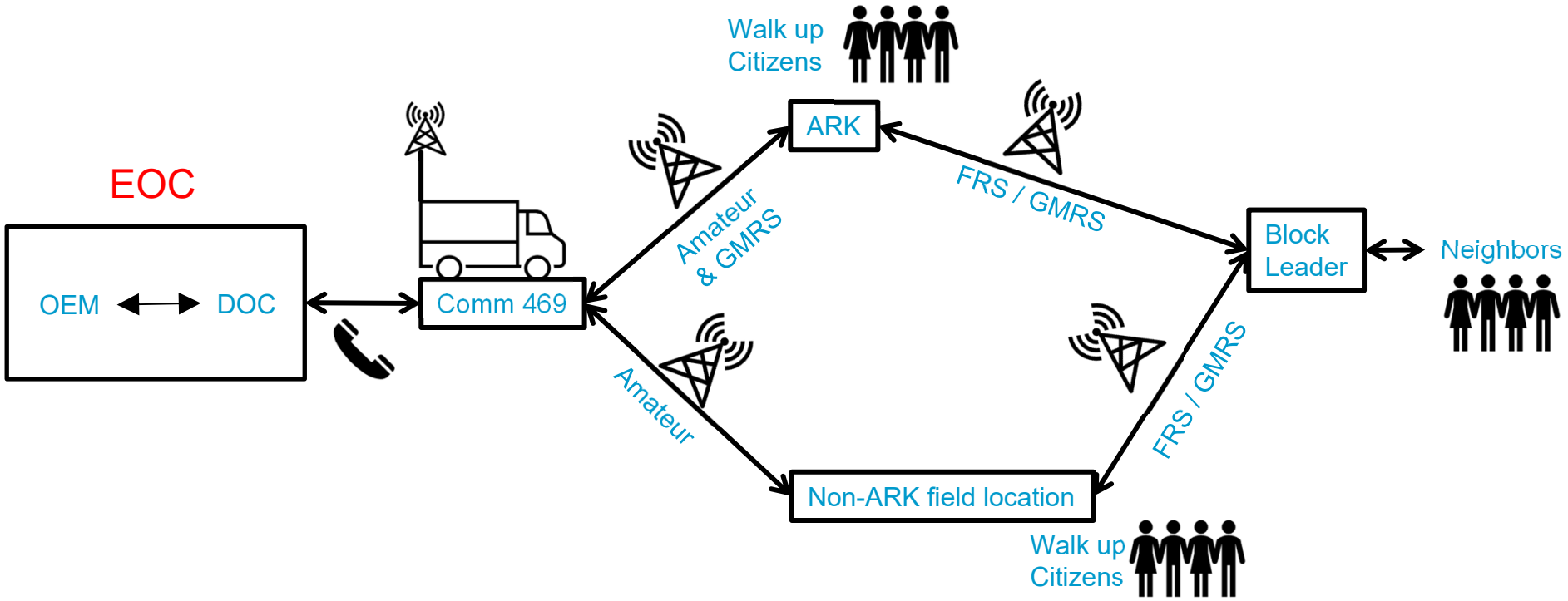
Post-quake Communication Elements

- EOC requires continuous 2-way communication with the CCC field staff for days, as public recovers from shock and damage.
  - CCC = eyes and ears (and mouth?)
  - Prioritize life threatening situations for attention
  - Fix transportation blockages
- Damaged bridges and roadways
- Debris damage blocking roadways
- Traffic signals not working
- Coordinate with utilities on priority neighborhoods
- Dispel or verify rumors
- Estimates times to restore power, water, sewage, natural gas
- Report locations and operating times for relief supplies

Post-quake Communication Elements

- Citizens require communication from City officials.
  - Updates on changed conditions
  - Locations of water trucks, first aid stations, camping spots, and information posts
  - Estimates for getting utilities operational
- Weak signal of Radio 1670 means setting up information hubs around the city, staffed by CARES and CERT members
- CARES and CERT provide situation updates to EOC.
- Notify residents PG&E may de-energize mandatory evacuation zones.

2-way Communication Between EOC and Citizens



How bad was California's 'Great Flood of 1862'? It was a torrent of horrors

- The Great California Flood of 1861-1862 was a series of four floods from December to January.
  - The winter rains started in November and continued nearly uninterrupted for four months.
- Stockton officials in Jan. received a telegram from high in the Sierra Nevada:
  - "It rains like fury. Hell is afloat. Look out for water!"
  - The line went dead after that. But residents of the Central Valley city didn't have long to panic. By the next morning, the San Joaquin River had risen several feet and broken levees, turning Stockton into a city of canals.
- News reports from the time describe a surreal scene:
  - Entire towns destroyed, and farmland and plains turned into lakes as far as the eye could see.
  - Almost everyone in the state was impacted by the flood, from those who lost homes to state employees who, in the chaos, didn't get paid for more than a year.
- The American River seemed to do the most damage.
  - Rose 60 feet near Folsom
- Perhaps the eeriest report came in a late January, where a passenger aboard a riverboat heading from Sacramento to Benicia reported seeing no dry land, except the mountains in the distance.

How bad was California's 'Great Flood of 1862'? It was a torrent of horrors

- Rural areas were hit the hardest. The *Marysville Appeal* reported citizens climbing up on the highest structure — a church steeple — and realizing they were surrounded by a lake.
  - From the spire of the Presbyterian church the water could be seen reaching 12 miles westward to the Buttes and three miles eastward to the rising land connected with the foothills.
- The lake stretched 20 miles wide and 300 miles long, up to 30 feet deep
- 4,000 dead. 1% of state population.
- Sacramentans, huddled in trees, on high ground, on rooftops, looked upon a city that had been transformed into a sort of frontier Venice
  - With the state government under water, the damage wouldn't be tallied for years.
- Legislative sessions moved to San Francisco for the rest of the session.
- A quarter of the state's cattle drowned.
- There was more than $100 million in damage; the equivalent of several billion in 2023 dollars.

This scene shows the floodwaters in January 1862 along K Street in Sacramento.

Add inflatable kayaks to our Go Kits?

How bad was California's 'Great Flood of 1862'? It was a torrent of horrors.

HISTORIC RAINFALL IN THE BAY AREA

From Dec. 26 to Jan. 15, 17 inches of rain fell on downtown San Francisco – the second-wettest three-week period since daily records began in 1849 during the Gold Rush.

San Francisco's five wettest 21-day periods (1849 – 2023)

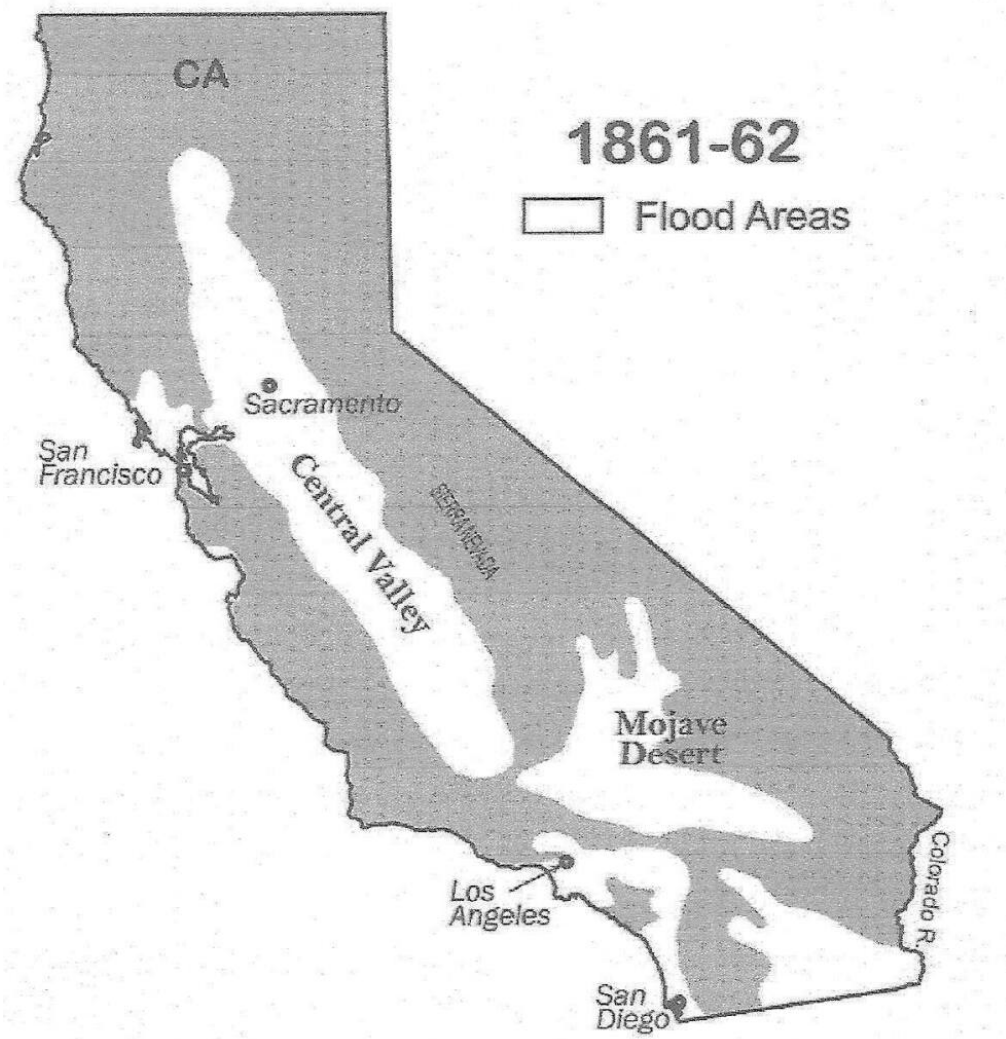
Rank	Dates	Rainfall in inches
1	Jan. 5 – 25, 1862	23.01
2	**Dec. 26, 2022 – Jan. 15, 2023**	**17.0**
3	Dec. 11 – 31, 1866	14.50
4	Feb 1 – 21, 1986	13.99
5	Jan. 11 – 31, 1911	13.01

San Francisco's wettest first halves of the rainfall season, July 1 – Jan. 15

Rank	Dates	Rainfall in inches
1	1861 – 1862	27.09
2	1889 – 1890	27.05
3	1852 – 1853	22.97
4	1849 – 1850	21.85
5	**2022 – 2023**	**21.54**
6	1871 – 1872	21.19
7	1972 – 1973	21.16
8	1866 – 1867	20.9
9	1981 – 1982	19.97
10	1955 – 1956	19.88

Sources: Golden Gate Weather Services and National Weather Service

BAY AREA NEWS GROUP



Oroville Dam Crisis, 2017

- The 2017 California Floods occurred in first half of the year.
  - Northern California saw its wettest winter in almost a century.
  - The flooding occurred at the end of one of California's worst droughts on record, and much of the state was unprepared to handle the huge volume of rain and snow.
  - The damage was estimated at $1.55 billion, including damage to California roads and highways estimated at more than $1.05 billion.
- Heavy spillway flow damaged Oroville Dam's main and emergency spillways, prompting evacuation of more than 180,000 people living downstream along the Feather River.

Erosion from emergency spillway

How “Weathered” Rock Played a Role in the Oroville Dam Crisis - YouTube

Concrete cap on emergency spillway

Local ARES support for recent rain events

- SC4ARES was activated four times by its served agency, the La Honda Fire Brigade.
- Activations due to severe winter storms which resulted in widespread power and communication outages, downed trees, flooding and mudslides in the south coast of San Mateo County.
  - DOC was established at the La Honda Fire Brigade.
  - ARES operators and CERT staffed the DOC 24 x 7 until the end of the activation.
- ARES operators transmitted emergency traffic and authenticated road closures to the EOC in Half Moon Bay.
  - In addition, they provided essential information to the local community, who in turn transmitted the information to their respective GMRS radio networks in their neighborhoods.

Local ARES support for recent rain events

- Staffed the TEP (Temporary Evacuation Point) at the Pescadero High School.
- Provided information about road closures, floods and mudslides in the Pescadero area to the DOC
- Relayed information between the Red Cross and San Mateo County DEM to the DOC.
- Half Moon Bay ARES activated:
  - Called to the Coastside EOC to provide communications support for areas that had lost power.

Austin power outage February 1

- Power failures from freezing weather in Austin led to 156,000 customers without power for up to 12 days.
  - Power failures affected about 30% of customers in the city of nearly a million.
- Communication issues and failures:
  - As outages dragged on, city officials came under mounting criticism for not providing estimates of when power would be restored.
  - Originally, Austin Energy, a department of the city of Austin, said outages would last 12 to 24 hours, but later the utility says it did not have an estimate for when everything will be resolved.
  - Austin Energy general manager said, "We don't have a way to get the information from the field to give accurate information."
  - Communication shortfalls in 2021 freeze were not remediated
  - Austin, a hub of tech talent, could not manage to do the seemingly simplest of tasks: send text messages to tell residents when they'd get their power back or that they should prepare for days in the dark.

Cool Hand Luke - Failure to Communicate - YouTube

Take aways

- Safety = #1
- Expect the unexpected
- Improvise, adapt and overcome
- Two-way communications between EOC and citizens is a must
- ISA: Hyper-focus on water assets
  - Fight fires
  - Sustain life
- Be prepared to be on duty for several days—DOC, shelter, 469, popup campgrounds….

Take aways

- Should we have backup to Comm 469?
- Mountain View backup to radio room at police station:
  - Three stations, each with push up mast
    - Repeater
    - Tac 1 simplex
    - Packet
  - Equipment running on battery power
  - Two canopies, two tables, three chairs
- Fourth station for GMRS?

Thank you

Any Questions?