Managing Sustained Emergency Operations After a Major Earthquake

Details you never thought about because you haven't been through one...yet

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Presentation Overview

- Emergency Management Cycle
- What Makes Earthquakes Unique?
- The “Do Over” List From Northridge
- Response Specific Issues
- Recommendations

Emergency Management Cycle

- Focus is generally on Mitigation and Preparedness
  - Resilience and risk reduction
- Table top and functional exercises typically focus on first 24 to 48 hours
  - Harder to simulate longer events
- Little consideration for managing an extended duration event
  - Few water events last more than 3 days

What Makes Earthquakes Unique?

Common Emergency Elements

- Power / Telecom outages
- Mobility Issues
- Potential for widespread damage
- Typically have some advanced warning signs

Uncommon Emergency Elements

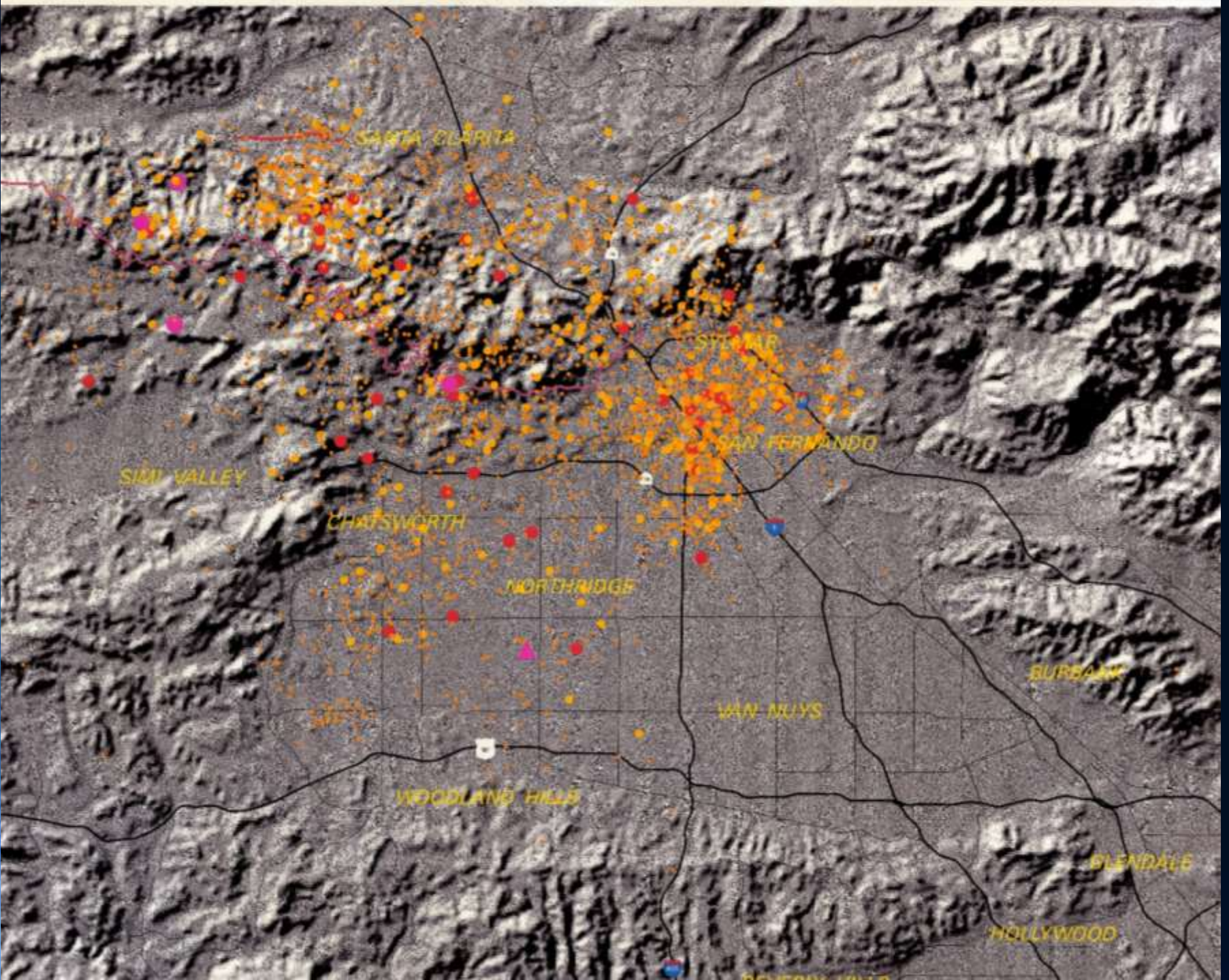
- No Warning
- Greater potential for water infrastructure damage
- High likelihood of fire ignitions
- Quantity of events occurring at the same time
- Aftershocks

The “Do Over” list from Northridge

- Characterize the extent of damage quicker, and better understand its impacts
- Improve utilization of internal staff resources
- Utilize mutual aid more efficiently and effectively
- Understand emergency documentation requirements
- Improve access to maps, drawings and records
- Pre-define alternative communication methods

Sizing Up the Event

- Situational Awareness
  - How extensive is the impact?
  - What's working, broken, non-repairable
  - Power and communication status
- Immediate Damage Control
  - Life / Safety issues
  - Assess potential for restoration and timeline
- An evolving effort
  - Changing conditions and new information
  - Number of responders

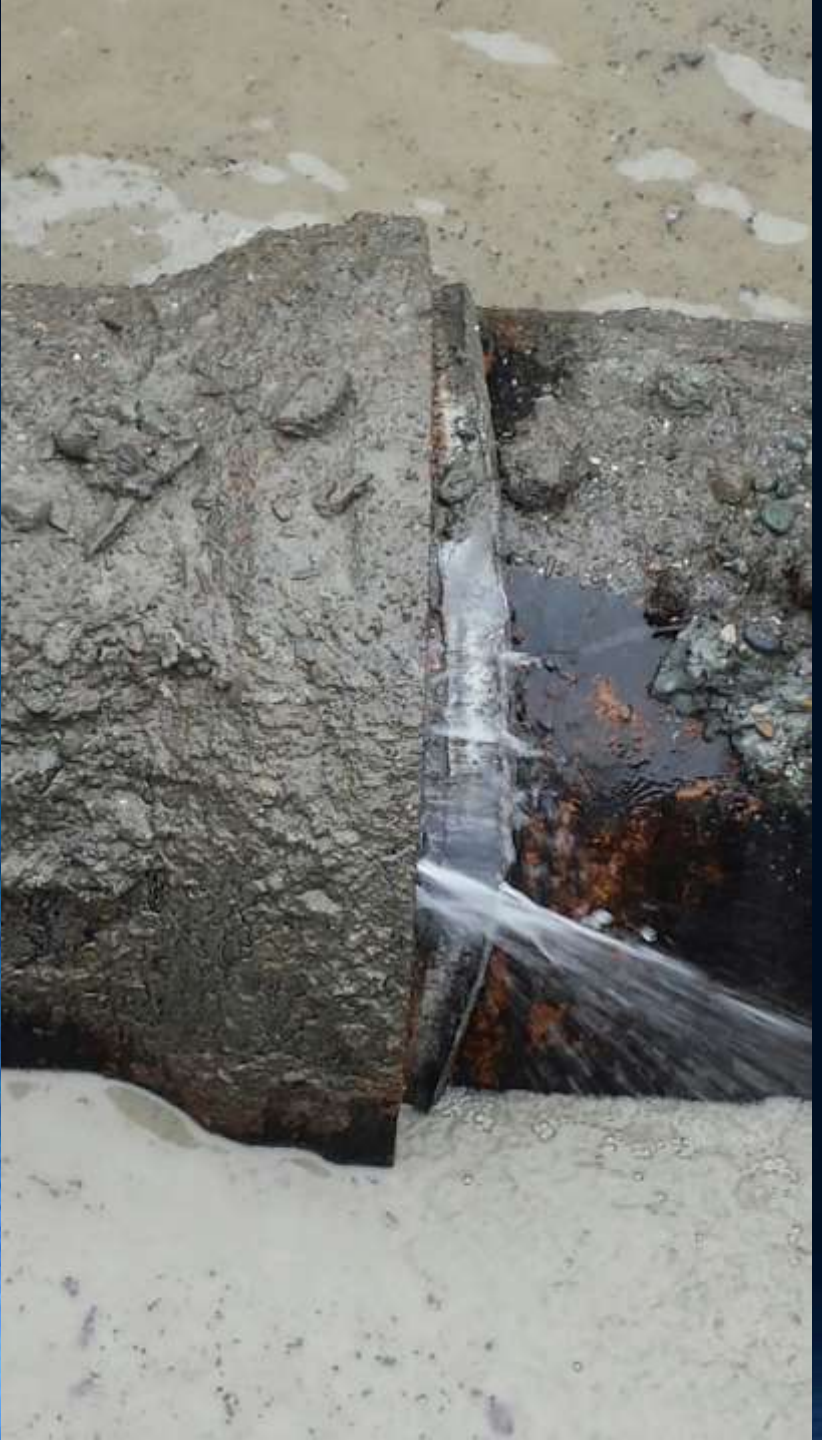


Northridge Aftershocks and Magnitudes Jan 17 – Feb 5, 1994

- Initial event
- 0 – 2.9
- 3.0 – 3.9
- 4.0 – 4.9
- 5.0 or greater

Objectives, Resources, Tactics

- Develop Incident Objectives
  - Restore water to the most people ASAP
  - Lift the Boil Water Order ASAP
  - Do not interrupt service once re-established
  - Do not degrade WQ in area once BWO lifted
- Determine Resource Needs
  - Manpower, equipment, materials, utilities, etc.
- Develop Tactical Response Plans
  - Functional, geographic, material-specific, etc.



Keeping Track of a Moving Target

- Utilize the *Situation Unit Leader* function in ICS
  - Part of the Planning Section, but needs to be tightly linked with the Operations Section
  - GIS can be a powerful tool if available
- Understanding the *capabilities* of your water system is paramount
  - Expand focus beyond design or normal use patterns
  - Repair, replace, or bypass decisions
  - Partial functionality is generally acceptable

Your Priorities Are Not The Only Ones to Consider

- EOC Priorities will take precedence
  - Fire fighting
  - Medical facilities
  - Mobility corridors
- Partial restoration might be acceptable
  - Some service better than none?
  - Potable or non-potable?

Staff Utilization

- Who will show up, and when?
  - Mobility, family care issues
- Field Response / Shift Durations
  - Round the clock response?
  - 8, 12, or 16 hour shift duration?
  - Supervision
- Reallocation of Internal Resources
  - Knowledge, skills and abilities
  - Emergency declaration may suspend labor agreements

Northridge 1994

Loma Prieta 1989

Kobe 1995

Nisqually 2001

Human Factors

- Your staff will be personally impacted by the earthquake in many ways
  - Fatigue and physical stress
  - Personal losses
  - Emotional stress
- How long at what pace?
  - Time off or continuous scheduling?
  - Northridge: Initial 12 days around the clock, transition to a single 12 hour shift for a month
- Simple things matter

Obtaining Mutual Aid Assistance

- Specific agreement with another agency
- WARN membership
- Requestor: You Need to be Specific
  - Number of people / skills
  - Equipment (with operators?)
  - Materials
  - Arrival date, meeting location, assignment duration
- Provider: Ask Clarifying Questions

IdWARN

WA WARN

OR WARN Oregon Water/Wastewater Agency Response Network

Field Response Operations

- ☐ Have curfews or other conditions been enforced by local government that might affect movement to and from worksites, feeding locations, and lodging?
- ☐ Identify additional communications operability:
  - Does Requesting Member have satellite phones to provide Responding Member?
  - Does Requesting Member have local portable cell phone systems (temporary, mobile cellular systems)?
  - If operational, how does the Members' communication system function?
    - What frequency does the Requesting Member operate on?
    - Will Requesting Member provide their radios to Responding Utility?
    - If yes, are radios available at the Staging Area?
    - If there are not enough radios to give to all Responding Member staff, are there enough radios to give to the Responding Member supervisors?
    - Does Requesting Member use amateur radio equipment for emergencies? If yes, is equipment (and operators) available?
- ☐ What navigation issues should the Responding Member be aware of?
  - Are street signs in place?
  - Are utility maps available (hardcopy or electronic)?
  - Do utility maps include GPS coordinates?
  - Are GPS units available?
  - Are maps and/or GPS units going to be available at the Staging Area?
  - Are interstates and highways open?

WARN Resources

- Checklists
  - Easier than creating on the fly
  - Helps both the requestor and the provider
- Links to Other Resources
  - AWWA, EPA, FEMA, Health Depts, etc.
  - ICS Forms
- Keep a Hard Copy File
  - Photocopier might become your best friend

Help has arrived. Now What?

- Treat them as a strike team
  - Don’t break them up
  - Set them up to succeed from the start
- Support them in the field
  - Example: Fuel for their vehicles
  - Consider adding one person from your utility to their team as a liaison

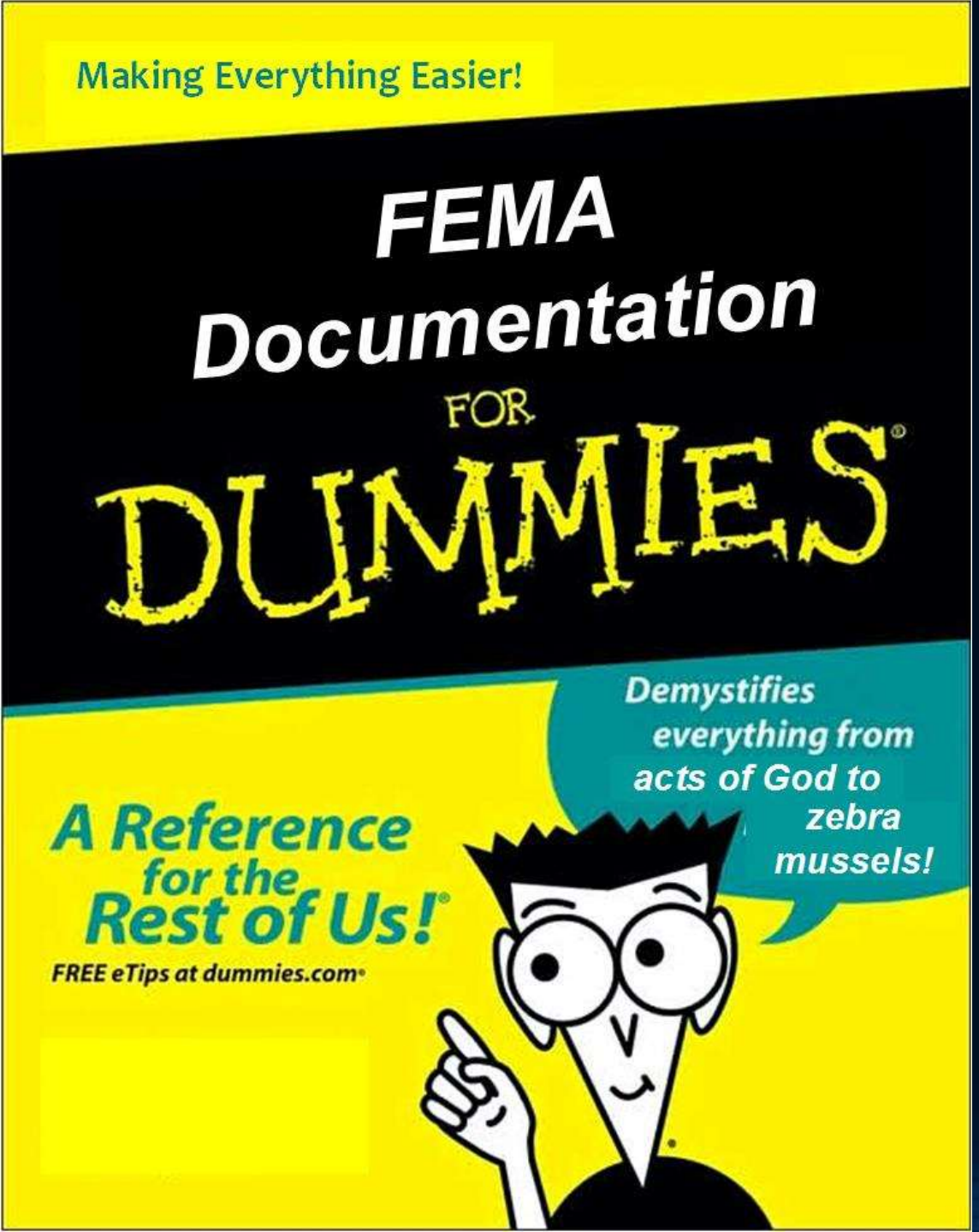
Other Sources of Help

- Emergency Contracting
  - May be able to skip the bid process
  - Access to specialized skills and equipment
  - Expect lots of competition
- Amend Existing Contracts
  - Re-task contractors already working for the utility
  - Match skills and abilities with your needs

FEMA

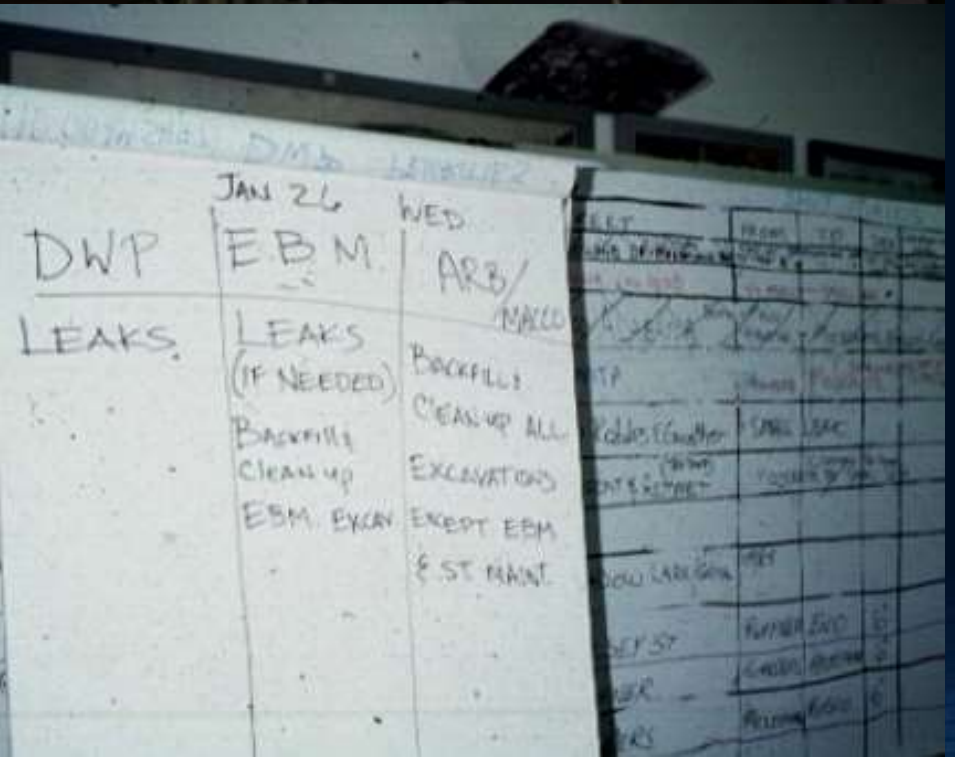
Documentation Matters

- FEMA Requirements
  - Your work order system alone may not be enough info to satisfy FEMA
  - Think Who, What, Where, Why, When
  - Who is responsible for Mutual Aid crews documentation?
- Multiple "Kodak Moments"
  - Create a complete photo record
  - At a minimum, include location, pre-work conditions, exposed problem and finished repair



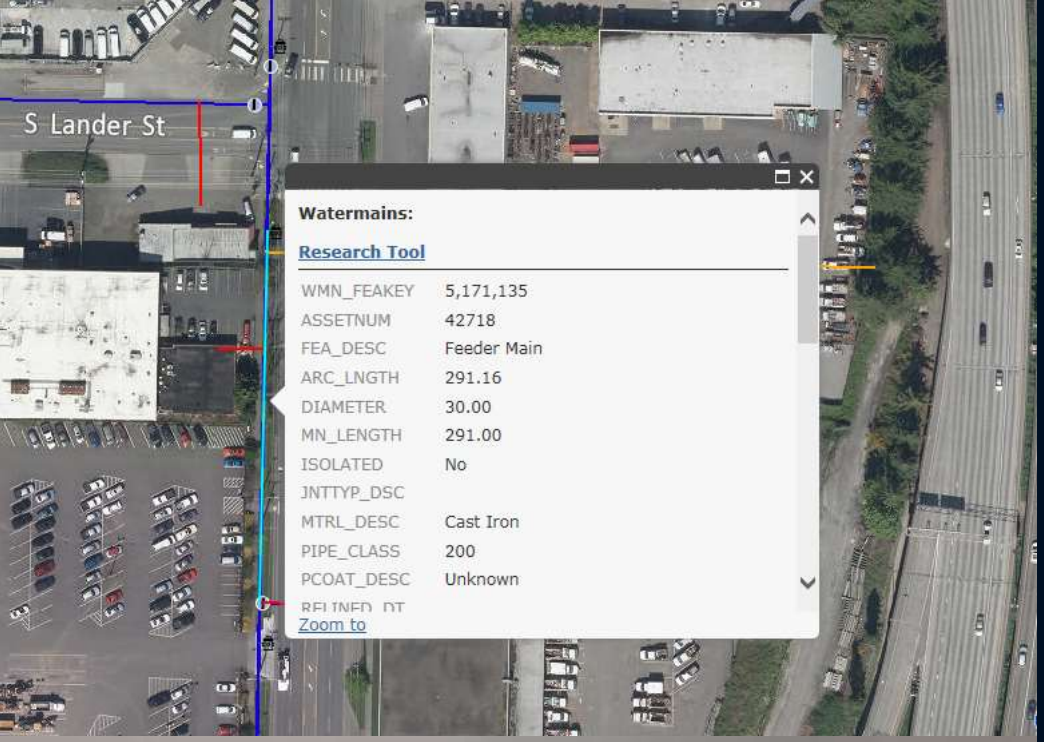
Documentation Matters Even More Down the Road

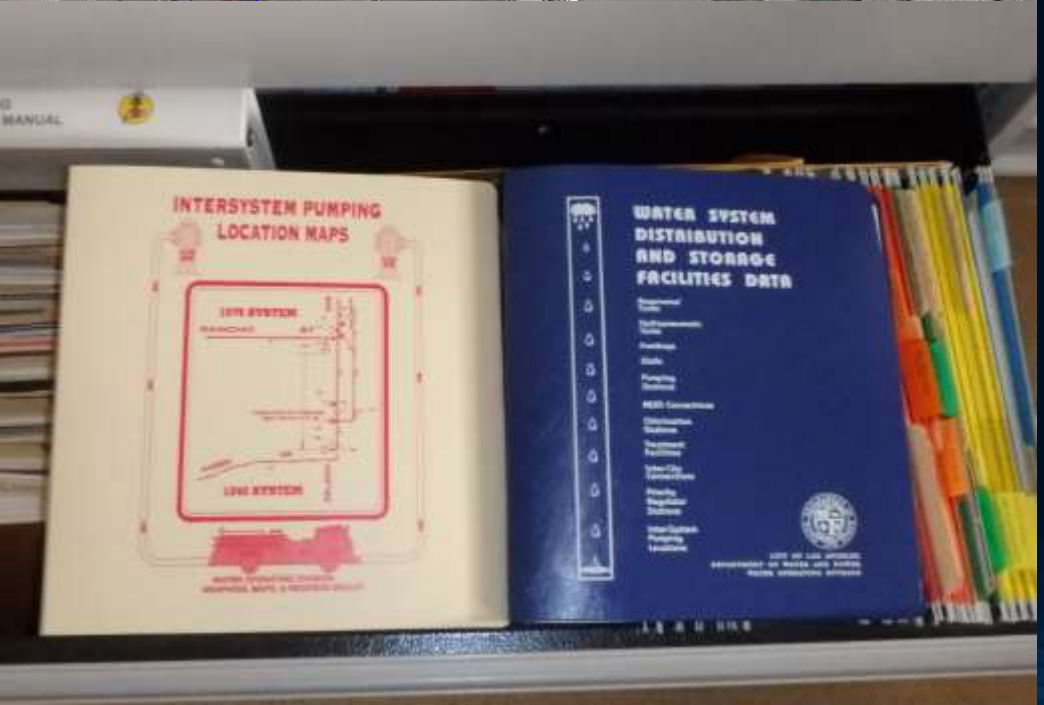
- FEMA Process is Long and Complicated
  - They are not anxious to pay you
  - Expect multiple requests for additional information
  - Finance needs to be involved early in the event
- Consistency, Completeness, and Accuracy
  - Regular Time vs Overtime, pay rate vs burdened rate, equipment rates, etc.
  - Common identifier on all source documents



Are you ready to go "Old School?"

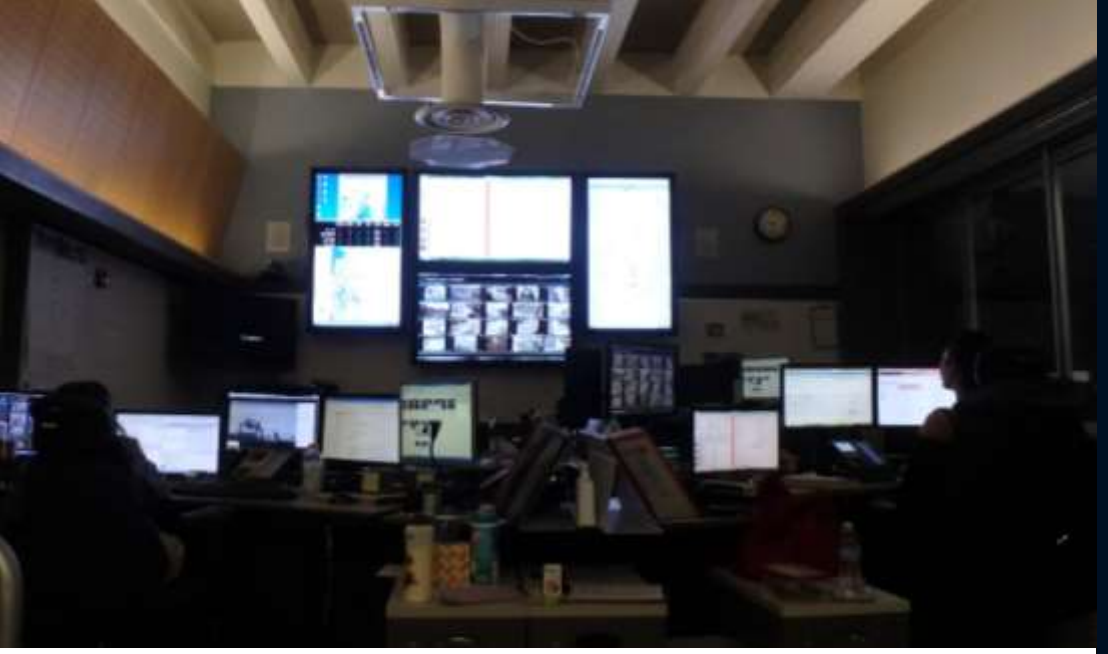
- What are your alternatives to primary computer applications?
  - SCADA, CMMS, timekeeping, etc.
  - Level of system integration
- Would you still have access to maps, drawings and records if:
  - No power
  - No computer network
- How will you keep track of everything?

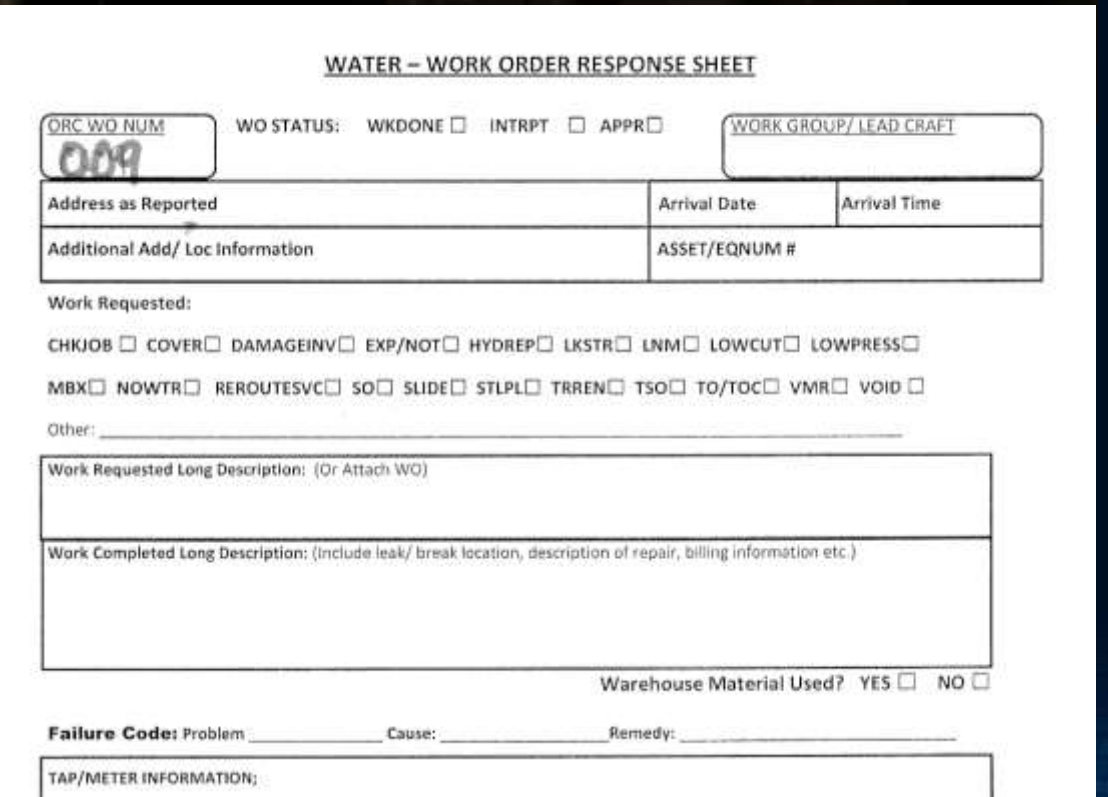




Maps, Drawings and Records

- Hard copies of key documents
  - Level of detail
  - Access to asset information
  - Print, DVD or flash drive copies
- Where are they physically kept?
  - Controlled environment?
  - Seismically secure?
  - Accessibility vs security





WATER – WORK ORDER RESPONSE SHEET

ORC WO NUM 009 | WO STATUS: WKDONE ☐ INTRPT ☐ APPR ☐ | WORK GROUP/ LEAD CRAFT

Address as Reported	Arrival Date	Arrival Time
Additional Add/ Loc Information	ASSET/EQNUM #	

Work Requested:

CHKJOB ☐ COVER ☐ DAMAGEINV ☐ EXP/NOT ☐ HYDREP ☐ LKSTR ☐ LNM ☐ LOWCUT ☐ LOWPRESS ☐

MBX ☐ NOWTR ☐ REROUTESVC ☐ SO ☐ SLIDE ☐ STLPL ☐ TRREN ☐ TSO ☐ TO/TOC ☐ VMR ☐ VOID ☐

Other: _____

Work Requested Long Description: (Or Attach WO)

Work Completed Long Description: (Include leak/ break location, description of repair, billing information etc.)

Warehouse Material Used? YES ☐ NO ☐

Failure Code: Problem _____ Cause: _____ Remedy: _____

TAP/METER INFORMATION:

Field Communication

- Technology has advanced, but the same vulnerabilities exist
  - Power, overloaded frequencies, etc.
- Alternative communication devices
  - Radios, landlines, cell phones
  - Satellite phones, text messages
  - Runners
- Protocols for switching

Recommendations

- Take the time now to discuss extended operations and understand how it will impact your response to a disaster
- If you're not part of WARN, join now
- Include documentation requirements as part of your Emergency Response Plan
- Have a "Plan B" back up for your electronic systems
- Consider including an extended duration simulation in your emergency exercises

Questions?

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