



Speaker – Jim Buck
Retired Washington State Legislator

Ends of the Earth:
Comparison of Cascadia
Quake in a Washington
Coast Community and
Lessons from Hurricane
Maria - Puerto Rico

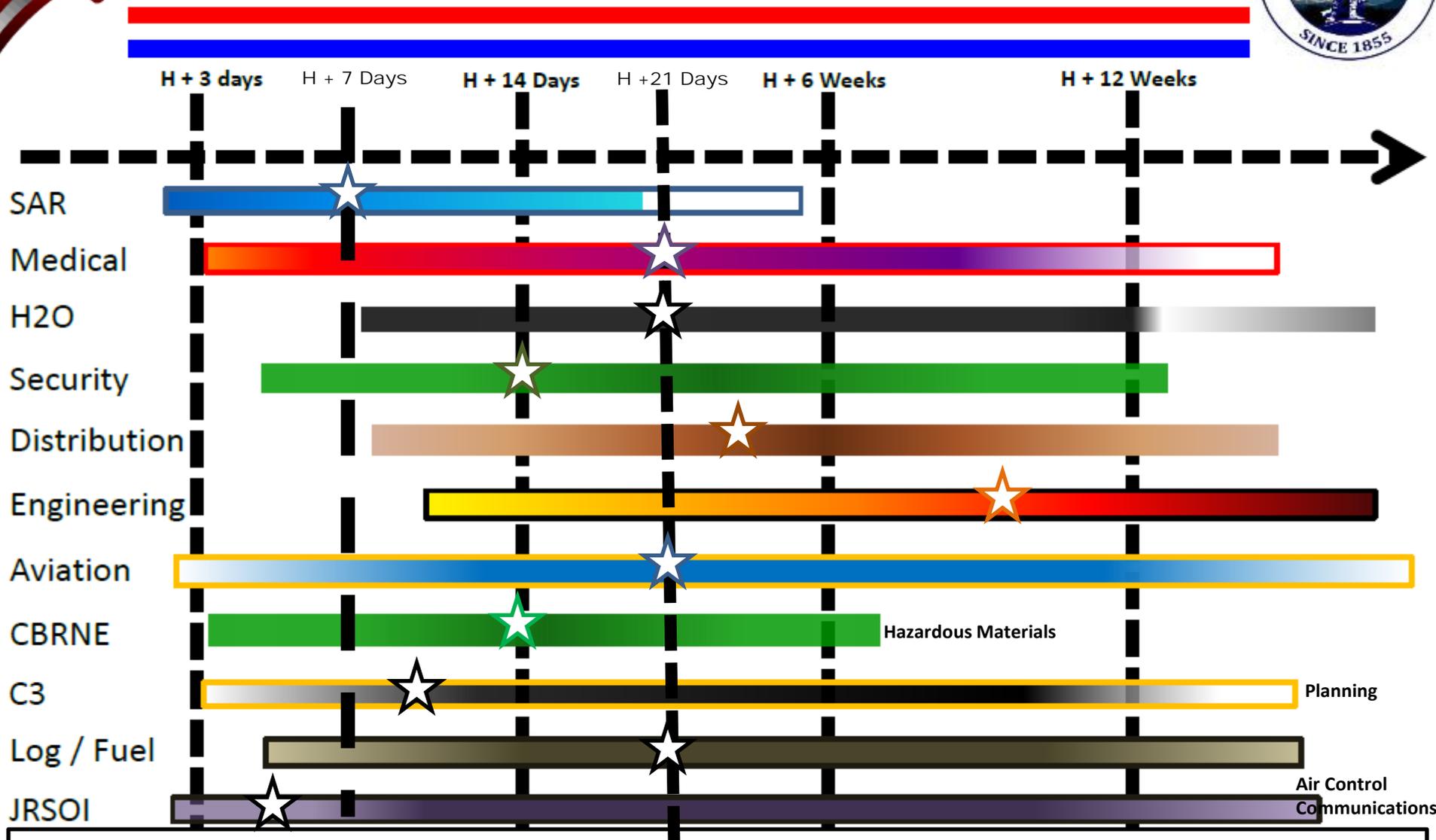
- How are they similar
- What lesson can be learned
- Isolation factors
- Length of time to recover



= Arrival Sufficient Outside Resources



Lines Of Effort



Key Question for Clallam County was whether lessons from Puerto Rico would validate our time line of 30 days for help. The answer was – Yes



Key areas that have to be considered in assessing the response time

- International Events
- National Mobilization
- Domestic Factors

All will impact the 30 day time line

The Ends of the Earth: Cascadia Coastal Washington vs. Hurricane Maria – Puerto Rico

Any discussion of a military disaster assistance has to be viewed in context with the international threat level and U.S. Government commitments



International Situation



US Military at Time of Hurricane Maria

Military Missions

- Deploying assets to confront North Korea
- Continuing its mission in Afghanistan

DEFCON 5 (Peacetime operations)

- No increase in the (DEFCON) DEFense readiness CONdition was required.

Military Facilities

- No significant US military facilities were affected.

All non-deployed military assets were available to respond.

US Military at Time of Cascadia

Military Missions

The quake will present a “window of strategic opportunity” for anti- US governments to take advantage of US pre-occupation with the emergency.

DEFCON? (Possible increased readiness)

- Response to foreign challenges could decrease military availability.

Military Facilities

- All military facilities in western WA affected
- The CSZE power failure will affect all military facilities between Canada/Mexico and west of the Montana-Dakota border.
- US strategic assets in the Pacific Northwest will be degraded. Some will be severely damaged or destroyed and unavailable for response.

Military assistance from the western US will be delayed.

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Current domestic factors also need to be considered



NATIONAL MOBILIZATION FOR PUERTO RICO

FEMA/National Guard Assets

- Partial mobilized by prior Hurricanes and those assets were shifted to PR

Traffic

COMM and fuel problems did not affect national mobilization.

Mobilization

- Mobilization on the U.S. mainland was not affected by the hurricane.

Supply Chain

PR is supplied by sea from Florida, gulf and east coast ports.

- Harvey and Irma damage did not impair relief shipments.
- The receiving Port of San Juan and San Juan Airport were open 3 days after the storm.
- Air and sea supply was not significantly interrupted.

NATIONAL MOBILIZATION FOR CASCADIA

FEMA/National Guard Assets

- Unknown

Traffic

COMM /Power outages and fuel shortages will delay rail and highway traffic throughout the western U.S.

Mobilization

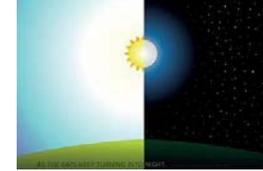
- Mobilization in states west of the Montana-Dakota border will be delayed by the power failure, elsewhere by weather.

Supply Chain

- Cascadia will impair relief shipments with damaged roads, rails, ports, receiving and warehouse facilities.
- Sea supply from southern California to the Pacific Northwest will be interrupted until ships and cargo are staged in SOCAL.

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In addition factors on the day of event that also need to be considered



DOMESTIC FOCUS FOR PUERTO RICO

Date – 9/20/2017

Daylight – 12 to 13 hours

Weather – Weather throughout the nation was favorable with no impact on national ability to respond to emergency.

General - National attention was focused on the effects of Hurricane Harvey and Irma on the Gulf Coast and forest fires in California. Hurricane Irma damage to Puerto Rico was not thought to be out of the ordinary.

Transportation, utilities, communications and economic activities were normal except in hurricane damaged Texas and Florida.

DOMESTIC FOCUS FOR CASCADIA

Date – Unknown

Daylight – Unknown

Weather - Unknown

General - National attention – focus unknown

Transportation, utilities, communications and economic activities are assumed to be normal. (EXPECT DELAYS FOR ABNORMAL CONDITIONS)

Demographics



Puerto Rico **3,515 Sq. Miles**

Total **3,515 Sq. Miles**

No Counties

78 Municipios (District Leader)

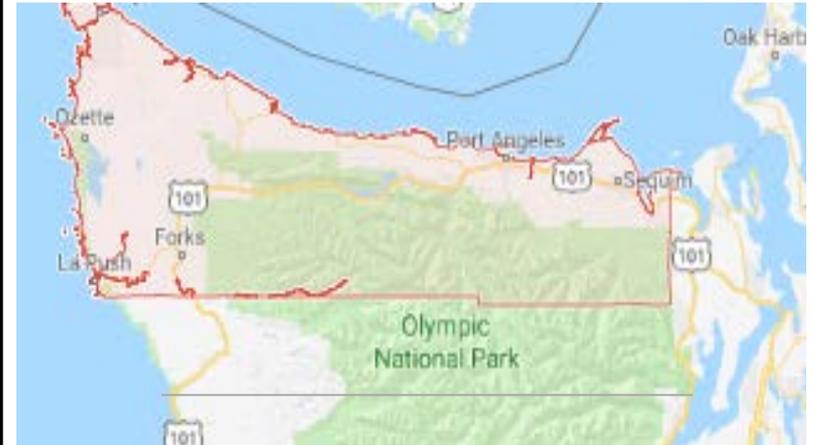
901 barrios (Mayors)

Population – 3.4 million

Isolated – Atlantic Ocean

Mountainous – Tropical climate

Demographics



Clallam County **1,738 Sq. Miles**

Jefferson County **1,804 Sq. Miles**

Total **3,542 Sq. Miles**

2 Counties

No Municipios

4 Incorporated Cities (barrios?)

Population – 104,000

**Isolated – Pacific Ocean, Hood Canal,
HWY 101, Cascades**

Mountainous – Cool to cold climate



Picture of Hurricane force winds from Maria in Puerto Rico

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Power lines were so heavily damaged they were left where they lay and new ones strung. Picture is 2 days after the event.



Winds just bent poles and dropped lines everywhere. Pictures to left and above are 5 months after the event the other is 2 days after the event



Highway Signs Destroyed



Debris is still not picked up after 5 months, only moved off the road.



Debris piles are everywhere and the debate is to burn it or contract to have someone process and recycle the wood.



**Solar and
Wind Systems
Destroyed**

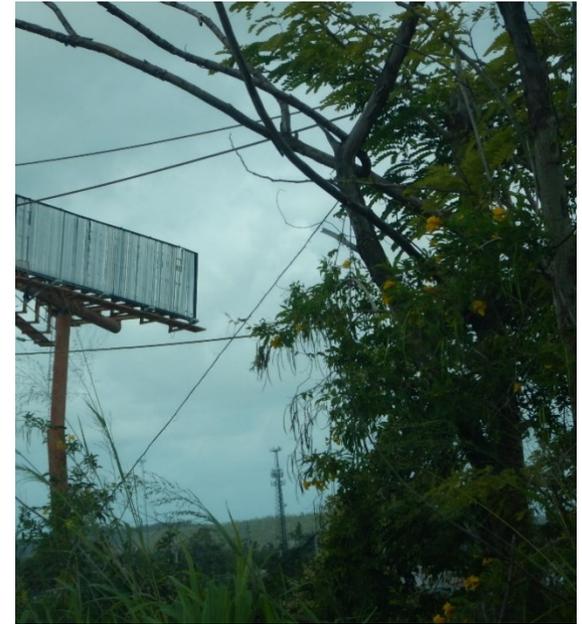
Before



After



Vegetation was ripped away by the winds



**Lack of signage and building
damage made business
continuity difficult**

Obstacles on the roads five months after the event





Road were steep, narrow and difficult to navigate



Homes were difficult to reach on mountain ridges



**Housing for FEMA disaster workers was in short supply –
A solution: cruise ship barge.**

Situation Comparison

Puerto Rico



CATASTROPHE

Direct hit by a Category 4 hurricane on 9/20/17.

EF 3 Tornadoic force winds over the entire island for twelve hours followed by torrential rains. Some areas experienced hurricane force winds for 25 hours, with 205 MPH gusts.



BUILDINGS

Most buildings suffered wind and water damage. Buildings in flood and surge zones were inundated. 40,000 were destroyed and 270,000 severely damaged. Lack of shelter was survivable.



SHELTER

Weather during the rescue and response period included scattered heavy showers with temperatures in the 90s. Lack of shelter was not life threatening.

Western Washington



CATASTROPHE

Western Washington will experience a 9.0 CSZE.

Severe ground shaking for up to five minutes PLUS a tsunami along the Pacific Coast, Strait of Juan de Fuca and Puget Sound.



BUILDINGS

Most buildings in western Washington will suffer structural and content damage that may limit their ability to shelter survivors. Few structures in the tsunami zone will be habitable.



SHELTER

Western Washington routinely experiences weather that can result in hypothermia for those without shelter.

Situation Comparison

POWER

The power grid was destroyed. Large cities and towns were operating on minimal power 5 months after the storm. Outlying areas may be without power for up to 15 months.



COMMS

The wind and loss of power severely damaged the COMMS grid. Much of the COMM grid is working on generator power.



Roads/Bridges

- All island roads were blocked by fallen trees, power lines, landslides, debris and/or washed out bridges.
- Most road beds were not destroyed.
- Main highways were reopened within 72 hours.
- Secondary roads took up to 3 weeks to reopen.
- 24 bridges and some road beds in flood zones and mountain slide zones were destroyed.

POWER

The Washington power grid will be severely damaged. Clallam County may be without power for up to a year.



COMMS

Loss of power will severely impact any communications grid that survives the earthquake.



Roads and Bridges – Cascade Crest to I-5

- Cascades to I-5 - Washington roads may be blocked by fallen trees, power lines, landslides, debris and/or fallen bridges.
- Some roadbeds will be destroyed.

Roads and Bridges – I-5 to Ocean

- All bridges and 80% of the road beds west of I-5 are expected to be destroyed.
- Large parts of Hwy 101 and 112 will be destroyed.

Situation Comparison

Port facilities were damaged but operational within three days.



Airport – San Juan (Munoz) Airport was open to military traffic on day 2 and limited civilian traffic after day 3. Runways were not affected by the storm.



The islands distribution system failed but is repairable.



Port facilities in Vancouver WA, Grays Harbor and Port Angeles will be destroyed. Port facilities in Bellingham, Everett, Seattle, Tacoma and Olympia will be severely damaged with uncertain reopening dates.

Airport - Usability of runways is extremely questionable in the days immediately following the quake. Runways at Port Angeles, Sekiu, Diamond Point, Port Townsend and Quillayute are expected to survive.

The region's distribution system between the Cascades and I-5 will fail but will be repairable.

The region's distribution system west of I-5 will be destroyed and must be rebuilt.

Government Preparedness

Lesson Learned - Advanced preparations save lives and simplify response needs.

Everyone we talked to said they had a reinforced concrete safe house to go to during hurricanes. This minimized the loss of life during the storm.

HOWEVER, nearly all said they underestimated the storm's violence and could tell during the event they had not prepared enough for the aftermath.

They were critical of their local governments' lack of preparedness.



Personal Preparedness

Lesson learned – First responders, government employees and volunteers will have difficulty mobilizing after the earthquake.

Action required – Be prepared



Emergency Distribution System

Lesson learned – Municipalities in PR that were prepared to receive and distribute relief supplies got them first.

Action required – Clallam County response plans must focus on reopening distribution routes sooner than other counties in the Pacific Northwest.



Lack of Understanding of FEMA's Role

Lesson Learned: Populations Lack Understanding of Federal Role in a Catastrophe
– False Expectations



FEMA
Distribution Center
Caribbean

VS



**FEMA DOES
THIS.**



**CLALLAM
COUNTY
DOES
THIS.**



BIG LESSON #1 – MENTAL HEALTH

Lesson Learned – Maria was a major traumatic event that is still affecting mental health on the island.

Actions required – Planning for faith based and professional mental health services to deal with Cascadia will be essential to maintaining order and recovery.



BIG LESSON #2 -Recovery and Business Continuity

No power = no work
No work = no pay
No pay = no purchases (Can't fix house - replace stuff)
No purchases = no receivables
No receivables = no payables
No payables = no stock
No stock = business closure (GO back TO "NO WORK")

Business were failing on a large scale - exceptions were big "Box" stores and franchises



BIG LESSON #3 – Debris Management

Lesson learned – Failure to plan for debris removal and management hindered response.

Action required – The county must develop contingency plans for debris management.





15 Emergency Support Functions (ESF)



1. **Transportation**
Department of Transportation



2. **Communications**
National Communications System



3. **Public Works and Engineering**
U.S. Army Corps of Engineers



4. **Firefighting**
Department of Agriculture/Forest Service



5. **Emergency Management**
Federal Emergency Management Agency



6. **Mass Care, Housing, Human Services**
Department of Homeland Security
American Red Cross



7. **Resource Support**
General Services Administration



8. **Public Health and Medical Services**
Department of Health and Human Services



9. **Urban Search and Rescue**
Federal Emergency Management Agency



10. **Oil and Hazardous Materials Response**
Environmental Protection Agency



11. **Agriculture and Natural Resource**
US Department of Agriculture/Department of the Interior



12. **Energy**
Department of Energy



13. **Public Safety and Security**
Department of Homeland Security/Justice



14. **Community Recovery, Mitigation, and Economic Stabilization**
U.S. Small Business Administration



15. **External Communications**
Federal Emergency Management Agency

Shown above are the key Emergency Support Functions

Beside the basic emergency plan required by law, each political subdivision (jurisdiction) should prepare response plans to support functions critical to the county response and recovery.

FEMA identifies these critical functions as Emergency Support Functions.

ESF 1 – Transportation – Roads & Bridges

Lesson learned – PR citizens volunteered to remove debris from the roads.

Action required - County responders need direction about how to use volunteers to move debris from roadways.

Action required – County responders need contingency plans for emergency stream crossings.

Action required – County planners need contingency plans for bypassing destroyed portions of Highways 101, 112 and 113. This includes moving relief supplies to coastal communities by boat and ferrying materials across rivers in lieu of bridges.



ESF 1 – Transportation – Ports & Airports

Lesson learned – **Early opening of PR ports and airports aided response actions.**

Action required – Port of Port Angeles and County planners need to formalize contingency plans to reopen the Port of Port Angeles and Fairchild International airport.

Lesson learned – **Ocean conditions prevented PR municipalities from using small craft to carry supplies around the island.**

Action required - Pre-planned resupply of the west end must be by boat along the Strait, at La Push and by ferries on the Elwha, Bogachiel, Sol Duc, Hoh and Queets Rivers.

Lesson learned (Florida Keys) – **Private (civilian) aircraft were able to fly emergency supplies to the Florida Keys when military assets were unavailable.**

Action required – County planners should coordinate western county supply distribution with Allen Barnard's DART program.



ESF 2 – Communications

Lesson learned – Loss of communications delayed response to some municipalities by more than 2 weeks. A delay like this after the CSZE could result in hundreds of fatalities.

Action required - Clallam County must develop a simple low tech COMM plan that can be taught to and implemented by county residents.

Lesson learned – Low tech COMMs are better than no COMMs.

Action required – CLALCO must develop low tech methods to keep residents informed about the progress of the response.



ESF 6 – Mass Care, Emergency Assistance, Housing and Human Services

Lesson learned – Shelter is a survival necessity in Clallam County.

Actions required – The county must mobilize the community and formalize arrangements to provide ESF-6 services throughout the county.

Lesson Learned – People will still be hungry after your 3 hour meeting about mass feeding is over.

Actions required – Cook, don't talk – someone will eat it and be thankful.



ESF 7 – Logistics Management and Resources Support

Lesson learned – The standard FEMA CPOD model did not work in Puerto Rico.

Action required – CLALCO must arrange to deliver relief supplies to neighborhoods or pre-designated distribution sites at main intersections throughout the county.

Lesson learned – Time is not our friend. Clallam County must plan for management of essential food, fuel, medicine and materials ON HAND AT THE TIME .

Action required – Educate county residents to be prepared to be on their own for 30 days without outside support.



ESF 8 – Public Health and Medical Services

Lesson learned – Health care technology is expensive, cool-looking plastic and wires without electricity.

Action required – Medical providers must be prepared to return to paper records until emergency power is restored.

Lesson learned – Modern medical facilities require power, water and sewer to operate.

Action required - All health care facilities should be encouraged to plan how to function without these services.

Lesson learned – Contaminated water is not our friend.

Action required – Create a public education program detailing how to stay clean and healthy in post CSZE environment.

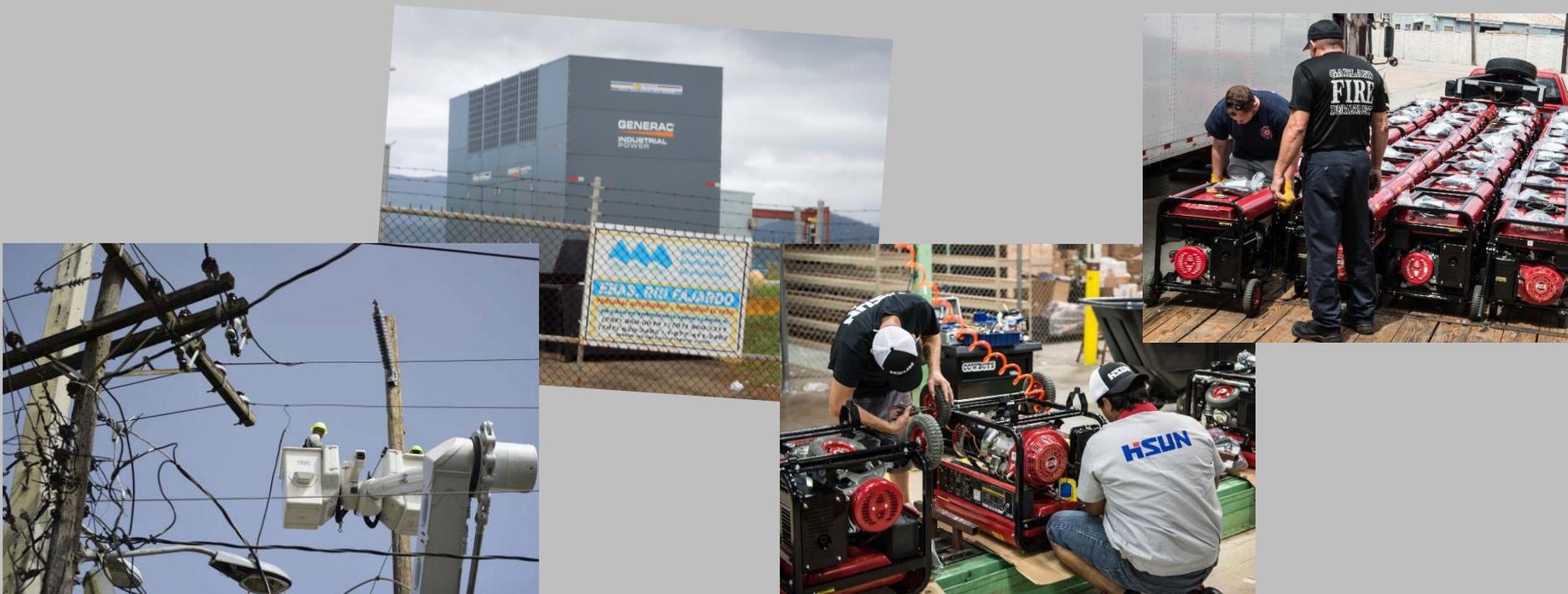


ESF 12 – Energy - Electricity

Lesson learned – Temporary electrical power was the common denominator for rebooting the PR recovery. Delivering and setting up generators after the disaster was time consuming and hindered all aspects of the response.

Action required - All critical facilities in CLALCO should be encouraged to acquire and maintain emergency generators and fuel.

Action required – Puerto Rico arranged micro-grids for critical facilities. EMD should identify critical power needs and work with PUD to develop micro-grid plans.



ESF 12 – Energy - Fuel

Lesson learned – **“No fuel equals no response” AND “your response plan is limited to what you can do with the fuel on hand.”**

Action required – **Establish arrangements with fuel dealers and owners of bulk fuel to reserve diesel and gasoline for emergency services.**

Action required - **The county must prohibit all unnecessary travel. The public needs to understand they must not drive unless there is a life-threatening emergency.**



ESF 13 – Public Safety and Security

Lesson learned – There was some looting and bullying during the first 72 hours. The Governor used his emergency powers to impose a 1800 to 0600 curfew and prohibited sales of alcohol.

Action required - Washington citizens must demand the legislature restore the Governor's emergency powers to respond to emergencies like Maria.

Lesson learned – Residents discouraged criminal behavior by remaining on their property and being alert.

Action required – Encourage residents to help each other by forming a neighborhood watch.



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Hauling Concrete to pour a base for a new power pole



Final Thoughts

- Puerto Rico is still struggling at five months and provides an insightful look into our future for the Cascadia Subduction Zone Event
- Local government effectively collapsed forcing FEMA to re-establish its functions
- About 80% of power has been restored
- Debris is yet to be completely cleared
- Business activity is no where near normal for the island
- Many are struggling to find basic supplies, work and to re-build