

Hurricane Maria Restoration Efforts

TEAM ARECIBO



Together, Building
a Better California

**Working together to restore power
to the people of Puerto Rico.**



One team one mission!



Puerto Rico Electric
Power Authority



FEMA



Hurricane Irma – September 6th – 7th

- Huge Category 5 storm whose eye passed just north of the island. That storm — which had ravaged several Caribbean islands — left 1 million people without power on Puerto Rico. That storm — which had ravaged several Caribbean islands — left 1 million people without power on Puerto Rico.



Hurricane Maria – September 20th

The Storm's Impact in Puerto Rico



- Powerful Category 4 hurricane with 150 mph winds
- Made [direct landfall](#) on Puerto Rico, bisecting the entire island
- Drenching rains

More than 1.5M customers were without power



Hurricane Maria Facts & Figures

On September 20, Maria made landfall in Puerto Rico as a Category 4 hurricane with maximum sustained winds of 155 mph.

100%
loss of
generation

PREPA has
2,400
miles of
transmission
lines, of which
89%
were damaged

PREPA has
30,000
miles of
distribution
lines, of which
80%
were damaged

51,850
poles and
5,473
miles of
wire
were
delivered
to the
island
(as of April
24)

33.3
million+
pieces of
material
were
received
by USACE
in Puerto
Rico
(as of April
25)

- Over 1.5M electric customers out of power
- Significant water and food shortages
- 100's of generators were deployed by FEMA
 - Most hospitals on generators with limited fuel
- Communications challenges – 1,360 of 1,600 cellphone towers damages
- Being an island complicates assistance – supplies have to be flown or shipped in

Fresh water is scarce



A woman collects water from an open road drainage of a natural spring created by the landslides in a mountain next to a road in Corozal, southwest of San Juan. | Ricardo Arduengo/AFP/Getty Images



US Coast Guard personnel offload relief supplies at the San Juan International Airport on September 22, 2017. | Aedle/Getty Images

Hurricane Maria: Key Milestones

Mutual Assistance Request & Response



OCTOBER 31

PREPA sends a letter to the Edison Electric Institute (EEI) and American Public Power Association (APPA) requesting help.

November 22

Governor Rosselle appoints Carlos Torres as the Power Restoration Coordinator (PRC). The PRC, EEI management team, FEMA, USACE and Governor Appointed Representative (GAR) draft the Unified Command Structure.

November 27

The Power Restoration Coordinator makes the request for Incident Management Team (IMT) support.

Late November
The new Unified Command Structure is approved.

OCTOBER 2017

NOVEMBER
2017

Hurricane Maria: Key Milestones

Mutual Assistance Request & Response

DECEMBER 8

Regional IMTs are approved and arrive in Puerto Rico.

DECEMBER 10

ThePower Restoration Coordinator makes his official request for industry line support.

DECEMBER 16

EEi identifies the companies volunteering line resources to travel to Puerto Rico and conducts the first coordination call.

LATE DECEMBER

Industry fleet vehicles begin to arrive at shipping ports to be transported to Puerto Rico. Nearly 20 barges carried more than 1,000 trucks and other equipment.

DECEMBER 2017

JANUARY 2018

Hurricane Maria: Key Milestones

Mutual Assistance Request & Response

Industry Response



JANUARY 7

The first EEi member company mutual assistance crews arrive on the island.



JANUARY 23

A majority of the EEi member company crews arrive on the island. About 1,500 lineworkers and support personnel were part of the first wave of deployment.

FEBRUARY 23

President Trump extends the 100- percent cost share for emergency power restoration for 60 days.

JANUARY 2018

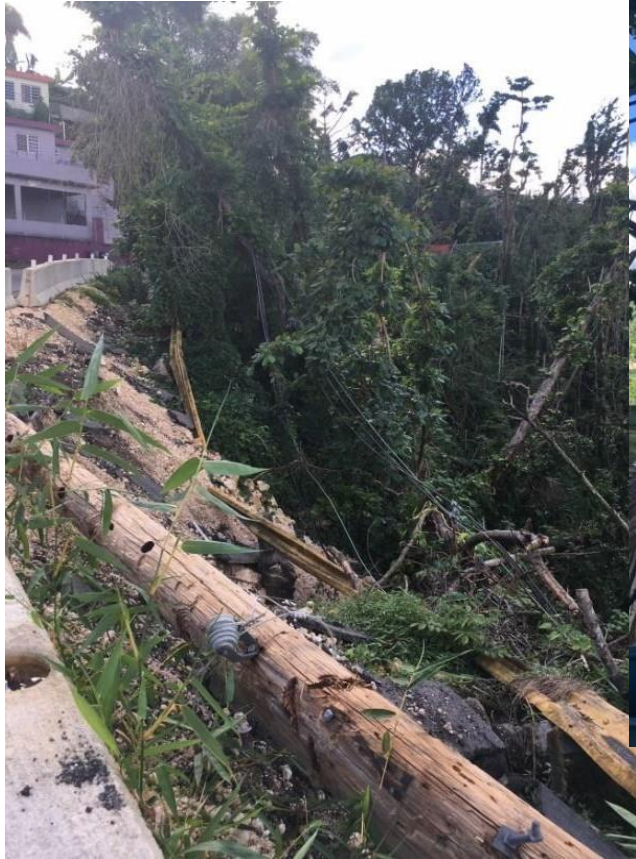
FEBRUARY 2018

Who Went: Region Overview



IMT teams on the ground December 8, 2017

Damages and destruction







PR Regions & Team Assignments



Puerto Rico Power Restoration Update



San Juan



Above logos correspond to regional IMT organization

Arecibo – 153

Oncor - 50
Centerpoint – 53
OG&E – 50

Bayamon – 147

FPL – 100
APS – 30
TEC – 17

Caguas - 152

AEP - 50
LG&E / KU - 14
PPL – 36
Xcel Energy - 52

Carolina -158

Ameren – 58
Dominion – 50
DTE – 50

San Juan – 152

Exelon – 100*
WEC Energy - 52
*tentative

Mayaguez - 124

Southern - 80
Puget Sound - 32
PGE (Portland) - 12

Ponce – 150

Duke – 150

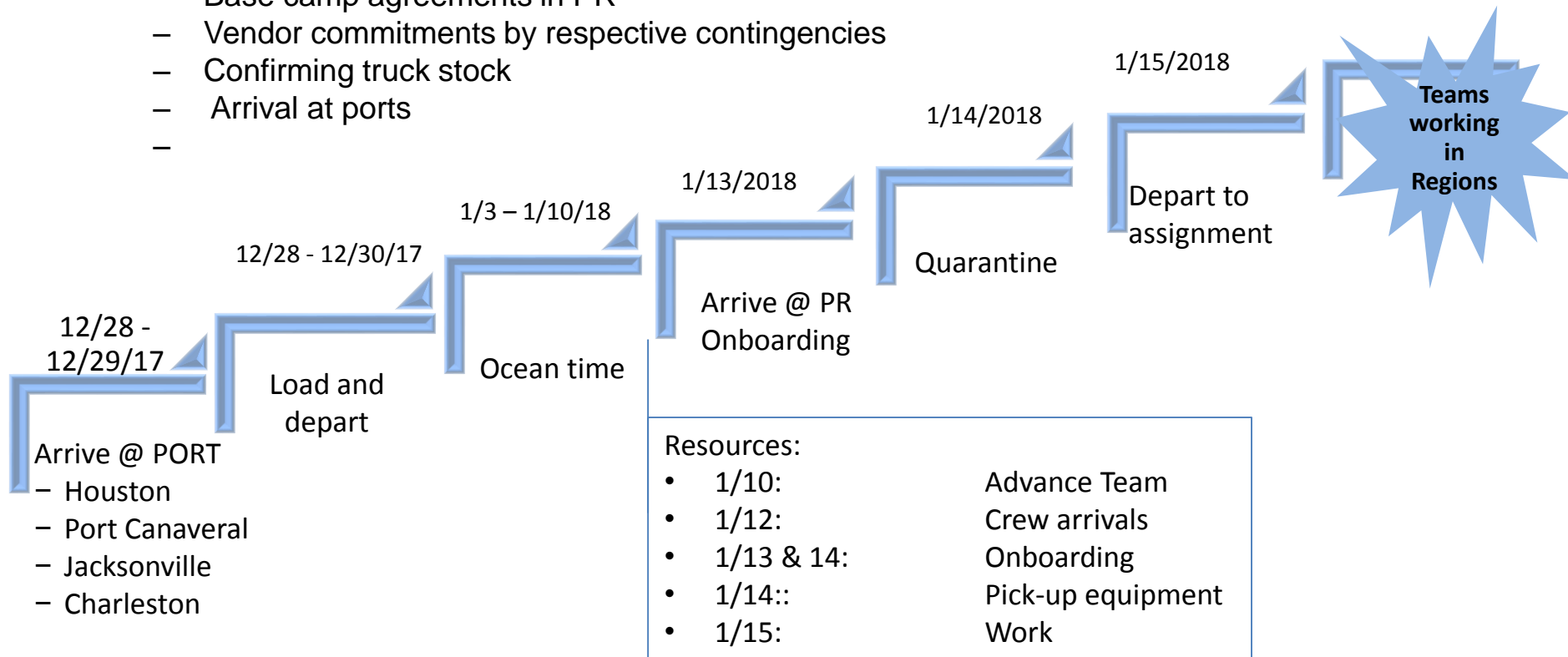
To Be Assigned

Allete
Consumers
PSE&G

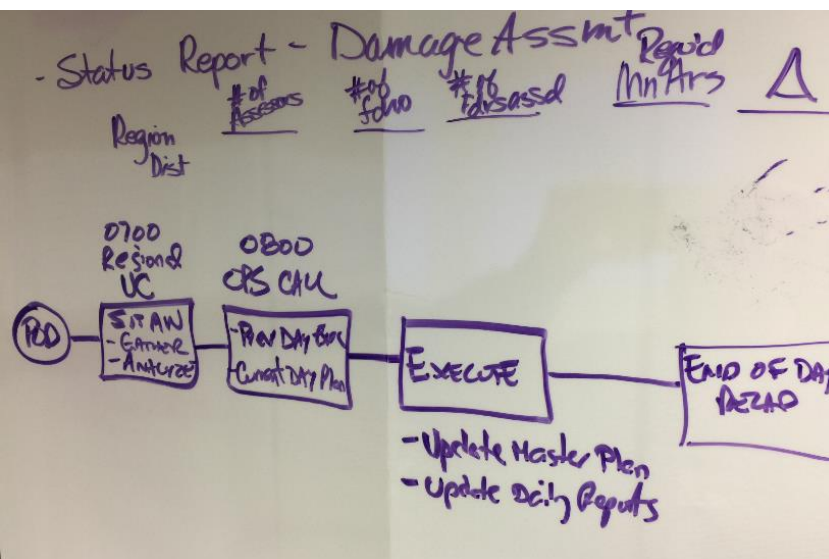
Timeline for barging trucks and equipment

Key activities for Puerto Rico 2nd Wave

- Base camp agreements in PR
- Vendor commitments by respective contingencies
- Confirming truck stock
- Arrival at ports
-



Small but mighty EOC



FEMA
US Army Corps of Engineers

Grid Restoration Stakeholder Meeting

Due Out Log

Task #	Responsible Party	Due Out Description	Due Date	Status
1	Safety	Safety incident follow up, process refinement	12/15/17	Notification forms under final review
2	FEMA	STEP Program advertisement/deconflict need	12/15/17	Meeting 18 DEC to link PREPA/STEP/MT/USACE
2A NEW	PREPA	STEP outreach program		Media outreach to inform customers to "be ready to accept power"
3	PREPA/USACE	Vieques island generator status (1/2 FMCI parts)	12/18/17	Parts due by 20 DEC, USACE brief, Mon 18 Dec
4	PREPA	Tar exemption RFI due out	12/18/17	Treasury demand, EO is primary CGA
5	FEMA/USACE/PREPA	Decision on desire to keep 3x belting barges for power	TBD	18 DEC, directly start, 18 DEC, exploring unit
6	USACE	Status of Yabucoa Generator	TBD	Meeting 18 DEC, to evaluate estimate of Praxair line status
7	PREPA	Christmas morning contingency plan	12/17/17	Plan due back on Sunday
8	IMTs	Maintenance plant reporting	TBD	IMTs assessing, feedback forthcoming
9	PREPA	OMS testing	ongoing	Friday test report sent, more phases to come
10 NEW	PREPA/MTs	San Sebastian festival reaction plan	1/10/18	1.5M plan, info and San Juan, need event reaction plan

Headcount

	12/14	12/15	12/16	12/17
D: PREPA (Int)	918	829	808	433
D: PREPA Subs	733	792	866	729
D: USACE	1086	1136	1074	1067
D: TOTAL	2737	2757	2748	2239
T: PREPA (total)	492	504	490	389
T: USACE	179	107	109	150
T: TOTAL	671	611	599	539
TOTAL BOG:	3408	3368	3347	2778

17 DEC 17

Don't travel alone

Communications – AT&T

Vaccines

- Hepatitis A and B, Typhoid, Rabies, MMR

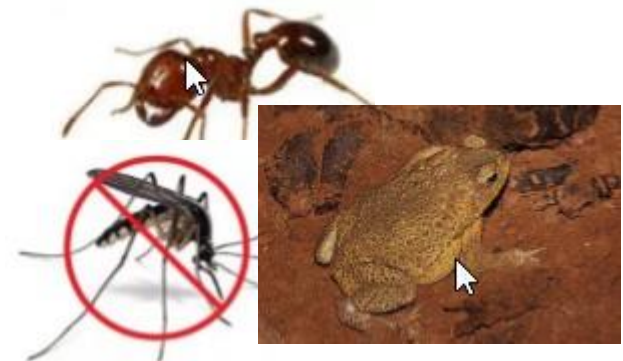
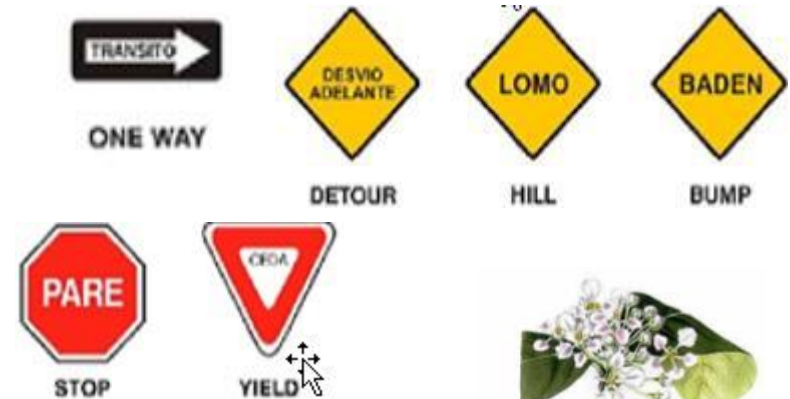
Driving: By far the greatest threat, much of the traffic infrastructure was not functioning and drivers don't follow four-way stop protocol.

- Terrain
- Dogs

Complacency

Poisonous Plants (12)

Dangerous animals and insects (10)



Barging crews in from Carolina's to Florida to Texas

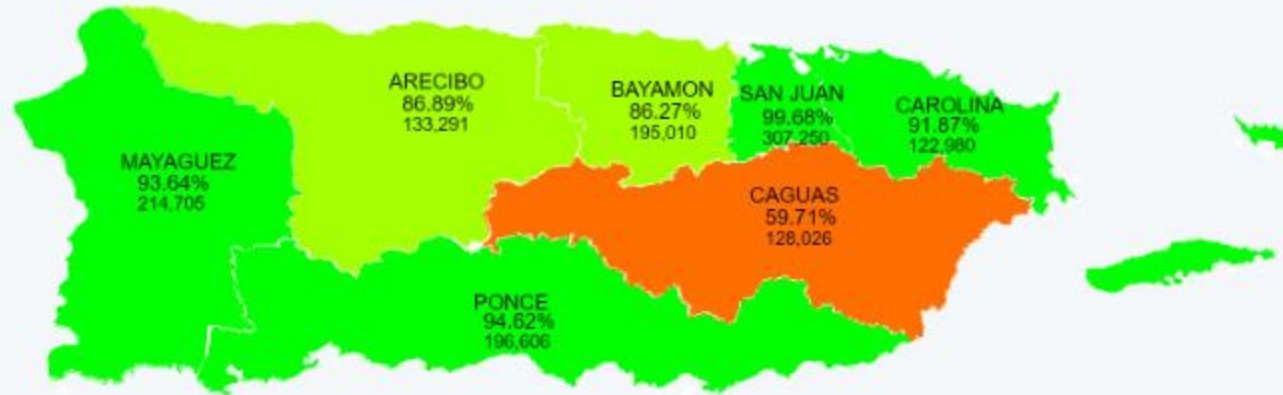


Setting up base Camps



- Language
- Understanding the “corporate” culture is driven by the societal culture
- Multiple parties with multiple priorities and responsibilities
- Keep an eye on financial processes
- Material and Equipment





Porcentajes en servicio:



175,000 still without service more than 160 days

- Practice makes “better” – *never rest on laurels*
- Collaboration is critical – *work at it during non-emergency days*
- Clear roles & responsibilities are crucial – *ensures priorities are handled*
- Strive to be open and transparent – *don’t assume everyone knows your “business”*
- Remember the “human” factor – *be aware of each other, stress, & impact*
- Better to “give” than “receive” – *eventually we will all be in “need”*
- ***Joint effort -***



The 1st Deployment: Establishing ICS



DAY 81 FOR PUERTO RICO, FOR 1 MILLION CLIENTS DAY 100

The People and The Culture

<https://youtu.be/gwk3npsnlV8>





To a better tomorrow

