
Hurricane Maria Disaster Response Support in Puerto Rico

Tom Lewis, PE, JD
President | Louis Berger US

Pier 14, Puerto Rico Temporary Power Mission
Sept. 2017 to Oct. 2018 ... and ongoing
Presenting Company & Leadership Team

- **Louis Berger, Inc.** – $1B(+) ; 5,000 (+) employee infrastructure engineering, planning/arch., PM firm – *pending WSP merger*

- **Tom Lewis, PE, JD** – President of US Division; founding Business Unit Manager for Emergency/Disaster Mgt. and Environmental Services

- **Vince Ricevuto, PE** – Sr. VP of Emergency/Disaster Management; Principal-In-Charge and Contract Manager for USACE Pitt. District Temp. Power Regional Contracts (ACI)

- **Steve Hill, PE** – Sr VP; Client Manager for US Army Corps of Engineers and Puerto Rico Power Field Office Mission Director; former Army Col. and USACE Pitt. District Commander
Agenda

1. Emergency Response and Disaster Recovery - Generally
2. Hurricane Season 2017 and Devastation in Puerto Rico (PR)
3. Louis Berger Post-Hurricane Contract Activity in PR
5. Questions
Post-Disaster: Engineer’s Roles/Opportunities

- Crisis Management
- Engineering – Hard and Soft Skills
- Construction, Operations & Maintenance
- Compliance and Ethics
- Leadership – incl. Environmental Stewardship
- People Management
- Project Management
- Risk Management & Safety
2017 Season for Disasters & Response

• **Historic and unprecedented**
• 17 different billion-dollar(+) weather disasters in 2017
• Nearly 9,000 wildfires in CA, incl. largest in CA history
• Hurricanes alone affecting 25.8 million people
• Hurricanes Irma and Maria impact Puerto Rico and USVI
Hurricane Irma, then Maria (September 2017)

Puerto Rico and Hurricane Maria - Category 4
154 mph wind (250km/h)
Utter Devastation in Puerto Rico

- 80% of territory’s agriculture destroyed
- Flooding up to 15ft (4.6m)
- 95% of cell towers were down
- 100% of power outage

<table>
<thead>
<tr>
<th></th>
<th>30 DAYS</th>
<th>60 DAYS</th>
<th>90 DAYS</th>
<th>120 DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Service</td>
<td>61%</td>
<td>96%</td>
<td>96%</td>
<td>98.5%</td>
</tr>
<tr>
<td>Potable water</td>
<td>69%</td>
<td>90.63%</td>
<td>86%</td>
<td>98.82%</td>
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<tr>
<td>Patients cared for</td>
<td>6,100</td>
<td>35,777</td>
<td>38,037</td>
<td>38,037</td>
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<tr>
<td>Open ATMs</td>
<td>1,047</td>
<td>1,300</td>
<td>1,586</td>
<td>1,586</td>
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<tr>
<td>Generators</td>
<td>148</td>
<td>645</td>
<td>933</td>
<td>708</td>
</tr>
<tr>
<td>Gas Stations</td>
<td>78%</td>
<td>85%</td>
<td>84.3%</td>
<td>88%</td>
</tr>
<tr>
<td>Power Generation</td>
<td>21%</td>
<td>49%</td>
<td>65.4%</td>
<td>80.3%</td>
</tr>
<tr>
<td>Installation of Blue Roof</td>
<td>439</td>
<td>11,196</td>
<td>23,455</td>
<td>55,692</td>
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Numbers of days after Maria made landfall
Our Response Work in Puerto Rico, ‘17-’18

• FEMA and PR Housing Inspection/Repair Programs
• US Postal Service Facilities Assessments/Rehabilitation
• US Coast Guard Facilities Assessments/Rehabilitation
• “Give Back” Projects (Corporate Philanthropy)
• Pending opportunities w/ PR govt. and utilities as things move from response phase to long-term recovery
• US Army Corps of Engineers (USACE) Temp. Power ACI
• Defense Logistics Agency Generators (DLA) Procurement
Top 5 costliest hurricanes in the U.S.
Harvey, Irma and Maria all struck U.S. territory in 2017. Hurricane Maria is the costliest hurricane on record to strike Puerto Rico and the U.S. Virgin Islands.

Damage estimates are adjusted to 2017 USD.

USACE deploys over 310 generators

USACE deploys over 1400 generators in PR

<table>
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<tr>
<th>Puerto Rico Temporary Power Mission</th>
<th>Numbers</th>
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<tbody>
<tr>
<td>Generators in Field (max.)</td>
<td>~1400</td>
</tr>
<tr>
<td>Total Gallons Dispensed</td>
<td>11M</td>
</tr>
<tr>
<td>Total Employees Deployed (max.)</td>
<td>1008</td>
</tr>
<tr>
<td># of partner subcontractors</td>
<td>~15</td>
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Our FEMA/USACE Mission under the NRF
The Mission

- Procure (DLA and USACE)
- Install and de-install
- Preventative maintenance
- 240-hour services
- Fueling operations
- Site condition reports
- Microgrid operations
- Transportation missions as needed
The team expands to multiple locations as the PFO HQ establishes systems
1. Installing / De-Installing
   • Capabilities to Install/De-Install Generators

2. Fueling
   • Capabilities to provide diesel fuel from four (4) locations for generators operating in the field and generator preparation for installation. – Ft Buchanan, Pier 15, Ponce, & A-ROC operations.

3. PM Inspections
   • Inspect all generators in the field every day with 2 qualified mechanics

4. 240 Services
   • Fulfill requirement to change oil & filters in generators after running for 240 hours.

5. Demob Activities
   • Including bookend SCRs
Generator Regional Operations Centers—H&I

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<tr>
<th>Regional Operation Center</th>
<th>Number of Routes</th>
<th>Number of Gens</th>
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<tr>
<td>AROC</td>
<td>9</td>
<td>112</td>
</tr>
<tr>
<td>PROC</td>
<td>12</td>
<td>211</td>
</tr>
<tr>
<td>JROC</td>
<td>37</td>
<td>520</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>846</td>
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• As the mission peaks - +1000 generators
• +200 generators to repair
• Pier 14 - 350 employees of approx. 1000
• Power remains out largely across Puerto Rico
Focused with People as Power and Priority

- Safety
- Inspiration
- Teamwork
- Optimization
- Redesign
- Delivery
Innovation, Going Green, Microgrids... *doing more than asked*

Berger donates WestGen SolarRover Hybrid generators (solar-diesel) to Community Centers

4 WestGen Solar Light Towers deployed at Pier14

OMNIMETRIX
GLOBAL MONITORING + CONTROL

Monitoring Generator Fuel Consumption.
Puerto Rico MicroGrids Support and Solar Hybrid NanoGrid “Give Back” Projects
THANK YOU!

Any Questions?
Contact: tlewis@louisberger.com