

Protecting Patients When the Power Goes Out

Phase I Report of the Los Angeles County EMS Agency's Emergency Power Resilience Initiative



Presented by:



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(P.I.O.N.E.E.R. stands for Power Information Needed to Expedite Emergency Response)

Project Overview

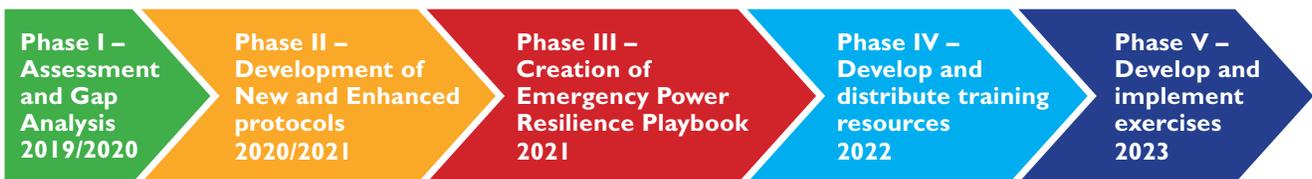
In May 2019, the Los Angeles County (LAC) Emergency Medical Services (EMS) Agency executed a contract with the 501c3 non-profit Powered for Patients to lead a multi-phase emergency power resilience initiative focused on critical healthcare facilities that will span a four-year period. The initiative is funded with federal Hospital Preparedness Program funding (HPP grant # FAIN-U3REPI90604).

Powered for Patients was launched in 2014 to address the lessons learned from Hurricane Sandy and other disasters that triggered the failure of hospital emergency power systems, leading to emergency evacuations and, in some cases, patient fatalities. The non-profit has received multiple rounds of federal funding to advance its mission of safeguarding emergency power and expediting government and utility response when emergency power is threatened. Powered for Patients advances its mission by facilitating increased collaboration between government, utilities and critical healthcare facilities and their generator service, fuel and rental providers.

The LAC initiative was launched to help ensure that LAC and its municipalities, along with its electric utilities and critical healthcare facilities, are employing best practices in minimizing threats to emergency power and expediting government, utility and private sector response when threats to emergency power arise during power outages.

The importance of this initiative has increased significantly given the impact of Public Safety Power Shutoffs that took place in 2019 and are projected to continue into the foreseeable future. Public Safety Power Shutoffs (PSPS), pre-emptive power shutoffs by utilities when weather conditions increase the risk of wildfires sparked by utility lines, were initiated multiple times in 2019 by Pacific Gas & Electric, San Diego Gas & Electric and Southern California Edison (SCE). The SCE shutoffs, which impacted hundreds of thousands of citizens and dozens of critical healthcare facilities in LAC, triggered the failure of emergency power system components at two Los Angeles County-area hospitals. Five skilled nursing facilities around the state also experienced failures of emergency power during shutoffs initiated by Pacific Gas & Electric. These failures underscore the vulnerability of emergency power systems, not only from Public Safety Power Shutoffs, but other threats, including earthquakes, wildfires and flooding.

The key phases in the multi-year LAC EMS Agency project, and their primary activities, include:



Phase I – Assessment and Gap Analysis May 2019 through August 2020

- Key Phase I Activity: Assessment of current emergency power threat reporting and response

protocols when emergency power is threatened during an outage, especially a longer-duration outage that could trigger a request by a facility for government assistance or prioritized power restoration. Assessment included a review of all relevant local, county and state emergency preparedness plans to assess government protocols (or lack thereof) for responding to requests for temporary emergency power support from an impacted healthcare facility.

- Key Phase I Activity: Identification of gaps in response protocols and development of proposed new protocols to better safeguard emergency power and expedite government and utility response
- Key Phase I Activity: Creation of an inventory of deployable emergency power assets owned or rented by LAC, the City of Los Angeles, the City of Long Beach and Southern California Edison (SCE); review of existing protocols (or lack thereof) that govern the deployment of these assets for critical healthcare facilities facing a threat to emergency power as an initial step in developing enhanced protocols for such deployments during Phase II work; assessment of steps needed to make these resources more rapidly available to facilities in need.
- Key Phase I Activity: Evaluation of emergency power systems at LAC-area hospitals. Site visits were made by Powered for Patients project director Eric Cote in August 2019 to seven LAC-area hospitals of varying sizes to view a representative sample of hospital emergency power systems. Cote also reviewed emergency power system details from a 2014 hospital emergency power survey conducted by the LAC EMS Agency. This work enabled an assessment of the wide range of emergency power capabilities as well as potential vulnerabilities of certain systems. In evaluating emergency power system survey data, Powered for Patients also assessed what additional information should be secured to further inform preparedness planning, enable facility-specific emergency power system risk assessments and inform future prioritization decisions about allocation of emergency power assets should this resource become in short supply
- Key Phase I Activity: Coordination with SCE and the City of Los Angeles Department of Water and Power to refine protocols for coordinated government and utility response to critical healthcare facilities facing a threat to emergency power during a disaster, including a discussion of Public Safety Power Shutoff notification protocols and prioritized restoration protocols
- Key Phase I Activity: Collaboration with generator service, rental and fuel providers serving LAC's critical healthcare facilities to include an initial workshop on January 27, 2020 to introduce key industry members to LAC public health and emergency management leaders. The workshop and additional research enabled identification of challenges facing providers in meeting the urgent needs of clients facing a threat to emergency power during a power outage and assessment of opportunities for enhanced coordination between providers and government agencies in overcoming challenges facing providers. The workshop and associated discussions helped inform planning around how to optimize deployment of government generator assets to augment private sector assets.

NOTE: Due to the COVID-19 pandemic, work on this initiative was paused in March 2020 given the critical role played by LAC EMS Agency in addressing COVID-19's impact in Los Angeles County. This pause delayed the completion of Phase I until August 2020 which in turn delayed the start of Phase II until August 12, 2020.

Phase II – Development of New and Enhanced protocols August 2020 through May 2021

- Implement key recommendations from Phase I Report to include creation and dissemination of new protocols

NOTE: Given the extensive work required to implement Phase I recommendations, the creation of the LAC Healthcare Facility Emergency Power Resilience Playbook, originally slated as a key deliverable in Phase II, has been pushed to Phase III of the multi-year project. As a result, originally planned Phase III work has now been pushed to Phase IV, necessitating the creation of a fifth phase of the project to address activities originally planned in Phase IV.

Phase III - Creation of Emergency Power Resilience Playbook 2021

- Creation of a LAC Healthcare Facility Emergency Power Resilience Playbook that outlines detailed protocols before, during and after disaster for all stakeholders responsible for safeguarding emergency power, deploying emergency power assets and prioritizing power restoration for impacted facilities during power outages. Key audiences for the playbook include:
 - o Local, state and federal emergency managers and public health preparedness officials
 - o Electric utilities
 - o Resident healthcare facilities such as Hospitals and Skilled Nursing Facilities and their generator service, fuel and rental providers

Phase IV – Develop and distribute training resources 2022

- Creation of training resources to help spur the adoption of protocols detailed in the LAC Healthcare Facility Emergency Power Resilience Playbook, including existing and new protocols

Phase V – Develop and implement exercises 2023

- Development and implementation of a table top or full scale exercise to test existing and new protocols detailed in the forthcoming LAC Healthcare Facility Emergency Power Resilience Playbook

Overview of Phase I Key Activities

Key Phase I Activity: Assessment of Emergency Power Threat Reporting and Response Protocols

Powered for Patients evaluated the current process used by critical healthcare facilities to report threats to emergency power during a power outage and the response to such reports by government officials and utilities. This evaluation was informed by detailed discussions with LAC emergency managers, public health officials and hospital personnel as well as a careful review of all relevant local, county and state emergency response plans. Plans evaluated to assess how they address threats to emergency power at a critical healthcare facility during a power outage, included:

- Los Angeles County Medical and Health Operational Area Coordination (MHOAC) Plan
- Los Angeles County Operational Area Emergency Response Plan
- Power Outage Annex to Los Angeles County Operational Area Emergency Response Plan (Not formally adopted)
- Los Angeles County MHOAC Allocation of Scarce Resources Guide
- Los Angeles County Emergency Medical Services Agency Communications Plan
- California Public Health and Medical Emergency Operations Manual
- State of California Emergency Plan

Just two of these plans explicitly reference how threats to emergency power should be addressed by an impacted critical healthcare facility. The California Public Health and Medical Emergency Operations Manual, produced by the California Department of Public Health (CDPH), describes medical and health resources as medical equipment and supplies, medical transportation and health care personnel. The manual describes non-medical and health resources as power generators, potable water, etc. Further, the manual notes that the resource ordering point for medical and health resources is the Medical Health and Operational Area Coordination (MHOAC) Program in accordance with local policies and procedures. The manual notes, as well, that the resource ordering point for non-medical and health resources, such as generators, is also determined by local policies and procedures, and states that such resource requests may be directed to the MHOAC Program. In these cases, it is assumed that MHOAC Program activities are conducted in coordination with the appropriate emergency management agency. Per the CDPH Plan, if it is local policy to direct non-medical and health resource requests to the emergency management agency, the MHOAC Program should be informed of such requests in order to maintain situational awareness.

In LAC, the LAC Office of Emergency Management (OEM) has addressed the protocol for responding to threats to emergency power at critical healthcare facilities through its draft Power Outage Annex to the Los Angeles County Operational Area Emergency Response Plan. This Power Outage Annex, published in 2017 in draft form, gave responsibility for addressing requests from healthcare facilities for emergency power resources to two county agencies. The draft protocol called on the LAC EMS Agency's parent organization, the LAC Department of Health Services (LACDHS), to fulfill requests for

generators and/or fuel from hospitals and healthcare facilities. The draft annex also called on the LAC Department of Public Health (LACDPH) to “establish and maintain communications with long-term care facilities, [and] coordinate generator and/or fuel requests.”

The Power Outage Annex was never officially adopted and is slated for revision to incorporate lessons learned from recent Public Safety Power Shutoffs (PSPS). As such, there is no current, approved LAC OEM process detailing which county agencies healthcare facilities should contact to request assistance during a threat to emergency power.

The Los Angeles County Emergency Medical Services Agency Communications Plan details procedures for a healthcare facility to follow when requesting support to address a “medical and health” need but the plan does not address requests relating to emergency power. Against the backdrop of no official protocols for addressing threats to emergency power at a critical healthcare facility from the LAC Office of Emergency Management (OEM) or the LAC EMS Agency, three current practices provide a means, albeit ill-defined, for how a critical healthcare facility would seek temporary emergency power support. The first path is through the LAC EMS Agency whose ownership of two 800 kW generators and several smaller generators is well known among jurisdictional hospitals. As a result, there have been instances in which jurisdictional hospitals have contacted the EMS Agency to request deployment of smaller generators for non-emergency purposes. These requests were made directly to the EMS Agency’s disaster program staff. The second path for these requests is the EMS Agency’s Medical Alert Center, a call center staffed 24/7, 365 days a year, to receive reports from hospitals when they are adversely impacted by routine emergencies, power outages or disasters.

The third path through which a request for emergency power assistance would be addressed is the LAC OEM. If such a request were to arise during a disaster scenario when the county’s Emergency Operations Center (EOC) is activated, adjudication of the request would be supported by the EOC’s Medical and Health Branch. When the LAC EOC is activated for events that have a public health impact, individuals are deployed to the County EOC to fulfill the Medical and Health Branch Coordinator roles. These individuals will be employees of either the LAC EMS Agency, the LAC Department of Public Health or the LAC Department of Mental Health. Decisions about which of these three agencies will deploy staff to fulfill the Medical and Health Branch Coordinator function are made based on the needs of a specific incident.

It is understood by LAC EMS Agency leaders that in a large-scale disaster, LAC OEM officials will likely have to make difficult decisions about which critical infrastructure facilities would receive limited emergency power assets. In these scenarios, the needs of critical healthcare facilities will have to be balanced against the temporary emergency power needs of police and fire stations, 911 call centers, water and wastewater treatment plants, prisons, etc. The individuals deployed to the EOC as Medical and Health Branch Coordinators would be in contact with their public health colleagues to receive updated information about the status of emergency power threats at critical care facilities and would share that information with emergency managers at the EOC to inform decision-making about deployment of temporary emergency power assets.

Recommendation: During Phase II, Powered for Patients recommends development of a clear protocol detailing how a request for temporary power support from a critical healthcare facility should be made and how such a request is to be adjudicated by LAC government agencies and larger

municipalities within LAC that have the resources to respond to such threats. This protocol should be disseminated to key stakeholders as early as practical and should eventually be incorporated as a key component of the LAC Healthcare Facility Emergency Power Resilience Playbook, a central deliverable of Phase III work.



In developing the protocol around requests for temporary power support, Powered for Patients recommends that the LAC EMS Agency work closely with the City of Los Angeles and the City of Long Beach in creating the protocol since both cities have their own caches of deployable emergency generators. As such, these municipalities will likely want to ensure that any protocol details how critical healthcare facilities in their cities can access their municipal assets. Powered for Patients also recommends that the LAC OEM be actively involved in the development of protocols addressing requests for deployment of temporary emergency power support. This involvement will not only enable valuable input but also help facilitate alignment of the forthcoming LAC Healthcare Facility Emergency Power Resilience Playbook, to be developed during Phase III of the initiative, with LAC OEM protocols.



It is also recommended that an Early Warning and Status Update protocol be adopted that requires impacted healthcare facilities to provide notification at the first sign of a threat to emergency power during a power outage to designated government officials and utility points of contact. Where practical, this early warning should be provided through the Power Information Needed to Expedite Emergency Response (P.I.O.N.E.E.R.) tool, a web-based asset developed by Powered for Patients as part of a project funded by the Department of Homeland Security. P.I.O.N.E.E.R. provides an automated, real time notification to designated government officials and utilities when emergency power is threatened during a power outage. (See appendix for additional detail on the P.I.O.N.E.E.R. Tool.)

This early warning, and subsequent status updates, whether provided through P.I.O.N.E.E.R. or manual notification, will enable accelerated government deployment of generators and preliminary preparations to support any evacuation that may become necessary. Informed by an early warning of a threat to emergency power, utilities could shift priorities to restore utility power before emergency power is lost. Subsequent status updates will keep government and utility officials apprised of the status of efforts to resolve the threat to emergency power and enable fine tuning of response plans. Success by government agencies or utilities in their respective efforts to quickly aide a stricken facility would protect patients, especially those most vulnerable during a hasty emergency evacuation.

Powered for Patients also recommends that the new protocol around requesting emergency power support and the Early Warning and Status Update protocol be submitted for review and adoption by the LAC Public Health and Medical Disaster Coalition Advisory Committee (DCAC).

As this protocol is developed, discussions with state officials from the California Department of Public Health (CDPH) and the California Governor's Office of Emergency Services (CalOES) will help clarify

what the state's response will be when the need for temporary emergency power assets by LAC critical healthcare facilities exceeds available generators from county, city and utility caches. These discussions will help clarify state criteria for deployment of state and FEMA assets.



During Phase I work, Powered for Patients' Eric Cote had a discussion with a CalOES official about CalOES protocols for how a request from a county (Operational Area) for deployment of state or federal temporary power assets would be addressed. The CalOES official suggested that CalOES would likely seek to verify that a requesting government entity had tapped emergency funds to secure rental generator assets, or verify that such assets were not available, before approving a request for deployment of state or federal assets. This official acknowledged that such protocols do not currently exist, underscoring the importance of addressing these details in planning discussions between LAC officials and CalOES (with input from CDPH).

A helpful resource to reference during the development of CalOES emergency power protocols may be the Southern California Catastrophic Earthquake Plan. This plan was recently revised by CalOES and it includes a chapter that provides explicit detail on how CalOES would work with FEMA to deploy FEMA-provided temporary power assets in the event of a catastrophic Southern California earthquake. The following sources of temporary emergency power resources provide a helpful framework to understand the expected sequence of how local, county, state and federal resources would be tapped in a large-scale disaster that exhausts local and county assets.

- 1) Assets w/in MHOAC's purview
- 2) Assets w/in LAC/LA City/Long Beach that are owned
- 3) Assets w/in LAC/LAC/Long Beach that are not owned (Rented)
- 4) Assets w/in State
- 5) Assets out of State (DoD, FEMA, USACOE)

Key Phase I Activity: Creation of Emergency Power Asset Inventory of non-Federal Assets

Among the key Phase I activities was creation of an inventory of deployable emergency power assets owned by LAC and the Cities of Los Angeles and Long Beach, compiled in an excel spreadsheet.

Between 2013 and 2016, Los Angeles County government, in concert with the City of Los Angeles and the City of Long Beach, collectively purchased a sizeable number of deployable emergency generators with federal Urban Area Security Initiative (UASI) funds. This cache includes:

- 12 800 kW generators (shared evenly between LAC and the City of Los Angeles)

- 23 200 kW generators (allocated between the City of Los Angeles, which has 11, and the City of Long Beach, which has 12)
- 8 60 kW generators (owned by the City of Los Angeles Fire Department)
- 13 20-25 kW generators (owned by the LA County EMS agency and deployed at each of the county's 13 Disaster Resource Center (DRC) hospitals)



This is a significant fleet even for the nation's most populous county and one that is capable of meeting the temporary emergency power needs of multiple hospitals, and skilled nursing facilities in a low-scale disaster that produces an extended power outage.

However, these assets should not be considered a rapid deployment fleet at the current time because there is no explicit protocol addressing how these emergency power assets can be requested and how they would optimally be deployed, either as individual generators or as a collective fleet. A further complication with respect to these generators is that these government entities own no electrical cabling to enable these assets to be quickly installed at a hospital or sub-acute long-term care facility. In addition, no official effort has been made to encourage facilities to secure the cabling needed to make the use of these assets easier.

In addition to these emergency power assets, it was learned during Phase I work that SCE has rental contracts in place with three large generator rental providers. These contracts enabled SCE to give the LAC OEM access to seven generators for deployment to facilities during the 2019 Public Safety Power Shutoffs.

Recommendation: Powered for Patients recommends that LAC EMS Agency work with the cities of Los Angeles and Long Beach during Phase II to create a mutual aid plan that details how these temporary power assets could be deployed individually or collectively and under what circumstances. This plan should be created in close coordination with the LAC OEM so that it can reflect needed input from county officials and to facilitate incorporation of the mutual aid plan in the pending update to the Power Outage Annex to the LAC Operational Area Emergency Response Plan. Existing MHOAC processes used by hospitals and skilled nursing facilities to request health and medical supplies during an emergency could be modified to specifically address the process for requesting and deploying emergency power assets. As this mutual aid plan is developed, it should be dovetailed with the new protocol that will detail how facilities should request emergency power support from city or county agencies.

Key elements of this mutual aid plan should also be detailed in the forthcoming LAC Healthcare Facility Emergency Power Resilience Playbook.

An October 2019 discussion between Eric Cote and senior leaders from the U.S. Army Corps of Engineers (USACE), which plays a central role in the deployment and installation of FEMA temporary power assets during federally declared disasters, shed important light on opportunities to make the

proposed mutual aid plan more effective in facilitating optimal use of county and city-owned generators.

Recommendations from USACE leadership included:

- Appointment of a Power Czar. “One of our recommendations is that LA County designate, or assign, hopefully in advance, what we call a Power Czar. Someone in their emergency operations cell [for whom managing emergency power issues] becomes one of his or her duties. This person’s the one that would have that inventory [of local and county assets] and when they hear that an event is not Stafford [and that federal assets are not available], this person plays a lead role in deciding who gets what. He or she has the inventory, the requirements for any unmet needs that come to this person up through their resource request chain, and he or she can then be the designee that says, ‘Okay, there’s this facility, it has this requirement, and one of our assets would meet that requirement.’” Pete Navesky, senior USACE official in charge of the Temporary Power Mission, (now retired).
- Installation of Onsite Quick Connect Devices at Critical Healthcare Facilities. “If they have the funding to do it, one of the best things [LAC and/or critical healthcare facilities] could do is put in a manual transfer switch outdoors (a quick connect). While the grid is running, life is good. If they need a generator installed, the quick connect reduces the amount of cabling because they can usually set the generator within 10 or 20 feet of the manual switch. When they operate this switch, it will disconnect the facility from the grid. [There is no risk of] back feeding [power] onto the grid. [In the absence of a quick connect], if they have to hard wire the generator into the electrical panel, they need to go to the facility feed and pull the fusible piece out [of the generator] so it doesn’t back feed onto the grid. While the quick connect has to be installed by a licensed electrician, when you need the gen set plugged into it, having the quick connect reduces the skill level needed for the hook up process.” Pete Navesky, USACE, Retired.
- Matching Generator Sizes between Deployable Assets and Facility Generators. “The most important thing for the county and city is to match those generators in their inventory with facility generators. So the assessments have to be done first. It goes back to the Emergency Power Facility Assessment Tool (EPFAT) and the facility determining what size [temporary generator] they need. If the generator deployed is too small for the facility, it can cause problems with the equipment itself, especially certain vulnerable equipment. If the generator is overpowered for the facility, it damages the generator. [LAC officials] need to have a list of all of the generators in the facilities to determine who can use their assets. Determining who can use their assets is step one. For step two, it is best to have a manual transfer switch or quick connect [and absent this], you need to decide if you want to leave cable at the facility [to enable faster connection of the temporary generators].” Dave Bishop, Temporary Emergency Power Subject Matter Expert, USACE



Powered for Patients wholeheartedly endorses the recommendations from USACE leaders detailed above.

Key Phase I Activity: Evaluating Emergency Power Systems at Los Angeles County Hospitals

Eric Cote's August 2019 site visits to 7 LAC area hospitals of varying sizes to view a representative sample of hospital emergency power systems, along with his review of a 2014 hospital emergency power system survey, revealed the strengths and gaps of emergency power at LAC-area hospitals. The seven hospitals Cote visited were:

- Cedars-Sinai Medical Center
- Ronald Reagan UCLA Medical Center
- Los Angeles County University of Southern California Medical Center (LAC USC)
- Long Beach Medical Center
- Garfield Hospital
- Monterey Park Hospital
- St. Mary Medical Center

The largest emergency power system, at the Los Angeles County University of Southern California Hospital (LAC USC), has 10 very large generators and a large fuel tank. Other large, well-known hospitals, including Cedars-Sinai and Ronald Reagan UCLA, also have large emergency power systems with substantial fuel capacity. In contrast, 14 hospitals in LAC operate with a single generator despite having ICU beds that could be occupied by patients whose lives depend on access to electrically powered ventilators. This lack of emergency power redundancy poses an elevated risk to the patients in those facilities.

Seriously outdated generators in a number of single-generator hospitals is another significant risk factor for patients in these facilities. Of the 14 single-generator LAC hospitals, ages of these generators are broken out as follows:

- Four are 10 years old or newer
- Two are between 30 and 40 years old
- Four are between 40 and 50 years old
- Two are between 50 and 59 years old
- Two are more than sixty years old

The likelihood of a facility with multiple generators suffering a complete loss of emergency power is significantly lower than a facility with a single generator. When factoring in the age of the generators deployed in LA County's single-generator hospitals, the risk factor for these facilities increases significantly. This heightened risk should be factored into prioritization considerations if a large-scale disaster resulted in a scarcity of emergency power assets to meet the needs of hospitals facing threats to emergency power.

Details on Emergency Power System Size in LAC’s Hospital Preparedness Program (HPP) Hospitals and non-HPP Hospitals

Number of Generators	Number of Facilities with available data (86 total)	% of Total Facilities
1	14	16.2
2	27	31.5
3	15	17.4
4	10	11.6
5	8	9.4
6	5	5.8
7	4	4.7
9	1	1.1
10	2	2.3

LAC EMS Agency leaders are not just focused on emergency power capabilities at hospitals. EMS officials have requested emergency power system information from the California Association of Health Facilities (CAHF) about the fifty-eight skilled nursing facilities (SNF) in LAC equipped to care for patients dependent on ventilators (considered sub-acute SNFs). (This information was still being sought as Phase I was concluding.) These facilities face the same emergency power requirements as a hospital, which means having a permanently installed generator that can automatically come online within 10 seconds of a loss of utility power. With rare exception, these facilities have a single generator. Like hospitals with single generator emergency power systems, this lack of emergency power redundancy in a sub-acute SNF should be factored into emergency power asset prioritization planning.

Recommendations:

- Develop an Enhanced Inventory of Hospital Emergency Power Systems
- Ensure that emergency power system information is collected via surveys for sub-acute SNFs during Phase II
- Create an Emergency Power Risk Calculation for Individual Facilities
- Develop an Allocation of Scarce Emergency Power Resources Assessment Worksheet

Develop an Enhanced Inventory of Hospital Emergency Power Systems

The proposed Enhanced Inventory of Hospital Emergency Power Systems will provide county officials with much greater detail on individual emergency power systems. This information will enable officials to identify which county and city-owned temporary emergency power assets are ideally suited for specific facilities.

Current federal reporting requirements from the U.S. Department of Health and Human Services, Office of the Assistant Secretary of Preparedness and Response dictate that the LAC EMS Agency

obtain the following information about the emergency power systems from hospitals that receive HHS Hospital Preparedness Program funding:

- Number of Generators
- Number of ICU Beds
- Size of Fuel System and Projected Fuel Burn Rates
- Status of HVAC Connectivity



Powered for Patients recommends collecting the following additional information for the proposed Enhanced Inventory of Hospital Emergency Power Systems:

- Age of individual generators and other emergency power system components
- Status of an emergency power system's ability to distribute emergency power across a hospital campus
- Existence of quick connect devices (or manual transfer switch) to enable rapid installation of temporary generators
- Details on fuel system to determine use of common tanks versus dedicated tanks per generator to enable more refined fuel burn rate calculations
- Recent incidents of emergency power system failure to help identify chronic problems with an emergency power system or isolated events with a small likelihood of reoccurrence
- Additional detail on patient acuity, i.e., presence of neonatal intensive care beds
- Existence of agreements with generator service, rental and fuel providers and names of providers (which will help facilitate industry engagement) and also help determine whether there is an overreliance by multiple facilities on a small group of providers
- Status of multiple feeds from electric utility and assessment of process for switching feeds if one fails to provide power or is shutoff due to a Public Safety Power Shutoff
- Status of access to temporary generators from sister hospitals or parent organizations
- Details on generator size, voltage and phase configuration (to help match the proper temporary generator with a facility generator being replaced)

Details on the Proposed Emergency Power Risk Calculation for Individual Facilities

The additional information obtained about hospital emergency power systems will help flag more vulnerable systems which can be reflected in the proposed Emergency Power Risk Calculation for Individual Facilities.

The risk calculation will also enable county officials to maintain closer vigilance of facilities whose emergency power systems are considered at higher risk.

However, it is important to note that decision-making about which facilities will actually receive limited emergency power assets during an outage will require real-time or near real-time information about the status of efforts by service or fuel providers to stabilize a facility's threatened emergency power system.

For example, if multiple hospital emergency power systems were experiencing mechanical threats or dangerously low fuel levels, decision-makers would need to know about the comparative severity of the mechanical threats and fuel levels to make informed decisions about which facilities are most in need of a temporary power asset. The recommended Early Warning and Status Update protocol addressed earlier in this report will detail protocols for status updates from a facility experiencing a threat to emergency power during an outage, either through ReddiNet, the P.I.O.N.E.E.R. tool or some other reporting process.)

Factors that would warrant a higher risk rating for facilities can include:

- Reliance on a single generator
- Emergency power system equipment approaching or exceeding recommended life expectancy (generator, automatic transfer switch (ATS), fuel tanks, etc. See Appendix for life expectancy table)
- Limited fuel capacity
- Patient type (hospitals treating specific types of patients such as psychiatric, burn victims and critically ill children cannot be as easily evacuated if there are no nearby facilities equipped to handle these types of patients)
- Patient acuity (high number of ICU beds, presence of neonatal ICU beds)
- Recent experience of mechanical threats to emergency power discovered during testing or power outages

Factors that would help reduce a facility's emergency power risk rating can include:

- A multi-generator fleet
- Availability of temporary generators from sister facilities or from parent hospital systems (especially relevant for hospitals that are part of large hospital groups such as Kaiser Permanente, HCA, Ascension, etc.) or access to rental generators based on existing agreements that guarantee access to a replacement generator if needed
- Presence of quick connect device (or manual transfer switch)
- Existence of two separate utility feeds into the facility or campus
- A multi-generator fleet with the ability to distribute emergency power among multiple facilities across a hospital campus
- Large fuel capacity (a hospital in LAC has a 200,000 gallon capacity for its emergency power system, enabling the facility to operate on emergency power for 10 days or longer)

Details on the Allocation of Scarce Emergency Power Resources Assessment Worksheet

The proposed Emergency Power Risk Calculation for an individual facility can help inform the proposed Allocation of Scarce Emergency Power Resources Assessment Worksheet by identifying which facilities are more likely to need temporary power support during an outage, i.e., facilities with a single generator that are approaching the end of their useful life cycle. This Assessment Worksheet would be added to existing worksheets in the Los Angeles County Medical and Health Operational Area Coordination (MHOAC) Program Allocation of Scarce Resources Guide. This guide was published in 2017 and includes Assessment Worksheets to provide health-related departments with an all-hazards, standardized approach and decision-making tool that can be used during incident response to allocate scarce medical, mental health and public health resources such as supplies, personnel, equipment, and services.

The existing Guide document provides the framework and context in which the allocation of scarce resources will occur, and the Assessment Worksheets are designed to be quickly implemented to support decision-making for scarce resource allocation. It is understood that the final decision for scarce resource allocation will be made by incident response leadership who will be informed by the Assessment Worksheets. If the P.I.O.N.E.E.R. tool is deployed to any hospitals or sub-acute SNFs, it can be a valuable source of real time emergency power status information regarding mechanical threats and fuel levels that can be used by individuals completing the emergency power Assessment Worksheet.

Key Phase I Activity: Facilitating Greater Collaboration Around Prioritized Power Restoration with Los Angeles County’s Electric Utilities

Among the key Phase I activities were meetings with SCE and the City of Los Angeles Department of Water and Power to discuss opportunities to increase coordination and information sharing between utilities and county government when critical healthcare facilities face a threat to emergency power during an outage.

The meeting with SCE, which took place on January 27, 2020, also enabled a detailed discussion about SCE’s Public Safety Power Shutoff (PSPS) program and how the utility notifies critical healthcare facility customers (and individual at-risk citizens) of a pending PSPS. At SCE’s request, LAC EMS Agency invited representatives of the skilled nursing and dialysis industries to take part in the meeting as SCE had not previously been able to establish a working relationship with them for the purposes of effective notification of pending PSPS. (SCE had already established an effective connection with hospitals through the California Hospital Association and the Hospital Association of Southern California.)

Attendees of the January 27, 2020 meeting included:

Terry Crammer, Chief, Disaster Services
Los Angeles County EMS Agency

Laurie Lee Brown, Program Manager
Los Angeles County EMS Agency

Chris Sandoval, Program Manager
Los Angeles County EMS Agency

Eric Cote, Project Director
Powered for Patients

Eileen Rhodes, Patient Services Director
End Stage Renal Disease (ESRD) Network 18

Krystal Swinton, Senior Manager
Business Outreach

Jason Belden, Director of Disaster
Preparedness and Physical Plant Services
California Association of Health Facilities

Bob Stiens, Senior Advisor, Government Relations
Organizational Performance

Cullen Armet, Business Continuation Team

Southern California Edison Team

Jeanne Boyce, Director
Government, Institutions and Agriculture

Key Highlights of Meeting with Southern California Edison Team

- All parties agreed that the meeting was an initial step in fostering enhanced communication and coordination around PSPS impacts on critical healthcare facilities
- SCE has a very detailed wildfire plan that includes robust situational awareness capabilities aided by advanced technology and human resources. They also have advanced technologies that allow the utility to isolate the extent of de-energization on individual circuits.
- SCE has the ability to prioritize re-energization by assigning “patrolmen” to specific areas to verify suitable weather conditions to warrant re-energization. Patrolmen in this case do not refer to law enforcement officials but SCE employees who provide on-the-ground situational awareness about wildfire risks and when conditions are suitable for power restoration.
- SCE has access to a limited number of rental generators through contracts with three rental providers. In 2019, during Public Safety Power Shutoffs, SCE made seven generators available to the LAC OEM for deployment to facilities in need.
- SCE has a voluntary registry of at-risk customers, many of whom are dependent on electric-powered, life-sustaining medical equipment. SCE uses this list to make contact with these citizens to ensure proper notification of a pending PSPS. A PUC proceeding was underway in January 2020 to consider giving SCE permission to share its registry of at-risk citizens with government officials to enable more coordinated outreach to such citizens. The federal emPOWER tool, developed by U.S. Department of Health and Human Services, was discussed as an additional resource to reach at-risk citizens. LAC public health officials use the emPOWER tool to identify at-risk Medicare beneficiaries in LAC who rely on electric-powered medical devices in order to check on these individuals when outages are expected. The question of whether LAC officials could share the emPOWER data with SCE was raised.
- SCE works to collect information on the emergency power capabilities of its customers (at least in the small, unassigned customer segment managed by Krystal Swinton).
- SCE deploys representatives to the LAC OEM Emergency Operations Center to facilitate coordinated disaster response.
- As LAC EMS Agency prepares to implement the proposed Early Warning and Status Update

protocol when emergency power is threatened at critical healthcare facilities, SCE can be an important part of this process. SCE's involvement in this protocol will be spelled out during Phase II work. SCE officials were briefed on the longer-range plan to use the P.I.O.N.E.E.R. tool to provide early warning and status updates when emergency power is threatened and encouraged to make use of this resource.

Key Highlights of Meeting with City of Los Angeles Department of Water and Power

Eric Cote provided an overview of the Powered for Patients Emergency Power Resilience Initiative. He also gave a presentation on the P.I.O.N.E.E.R. tool and its ability to provide real time alerts from impacted healthcare facilities to emergency managers, public health officials and designated individuals from LADWP when emergency power threats unfold during outages. As during the meeting with SCE, Cote asked LADWP officials to embrace use of the tool during its launch in LAC.

Cote answered a number of questions from LADWP representatives and the City of Los Angeles Assistant Fire Chief Carlos Calvillo.

Assistant Chief Calvillo provided background on SALUS, a disaster planning and response dashboard used by the City of Los Angeles developed by the City's Homeland Security Advisory Council (HSAC). He suggested that SALUS might be a platform that the P.I.O.N.E.E.R. tool could interface with.

Bill Lewis discussed the technical differences between electricity generated by LADWP compared to SCE and indicated that these differences would require emergency power systems at LADWP customer sites to be configured differently as a result.

Prior to this January 28, 2020 meeting, Eric Cote had an extensive discussion with LADWP's Keith Garcia, the utility's Emergency Preparedness Coordinator. Garcia detailed the overall emergency planning and response approach of LADWP, described as follows:

- LADWP uses an internal process to address prioritized power restoration for critical healthcare facilities impacted by power outages. The process involves a unit called Electric Trouble, which is a first-response team that addresses any power outage that impacts critical customers. The Electric Trouble team knows of all critical customers on a specific branch.
- Garcia's Emergency Management unit is an auxiliary unit that coordinates with Electric Trouble. A hospital facing a power outage is likely to call the Electric Trouble line or their key account representative. The same is true for a hospital facing a threat to emergency power during an outage.
- Hospitals, fire stations and police stations are prioritized for restoration. In addition to these facilities, LADWP will work with other healthcare providers to try and prioritize to the extent possible. An example provided on this front was the Community Clinic Association of Los Angeles County (CCALAC). Many of these clinics have vaccines and other medicines that will be destroyed if refrigeration is lost. Efforts to increase coordination between LADWP and CCALAC have been initiated.

- LADWP’s electric power system is made up of receiving and distribution stations. There are 100 distribution stations throughout the system and seven “yards” where service crews are stationed
- LADWP also has mutual aid agreements with other municipal utilities in Los Angeles County for sharing “glove-ready” restoration and service crews
- During disasters, LADWP deploys key staff to the City of Los Angeles Emergency Operations Center to assist with prioritized restoration. In a large-scale disaster requiring tough prioritization decisions, the Mayor’s Emergency Response Committee (MERC) is in charge of decision-making. This committee includes the Mayor, the Deputy Mayor for Public Safety, the city’s Director of Emergency Management and the City Attorney. (It was not clear how coordination occurs between the city and county emergency operations centers when threats to emergency power arise at critical healthcare facilities in the city of Los Angeles.)
- The city of Los Angeles has a General Services Department, which Garcia described as the first access point for a city department wanting to access generators. Details on the number of generators that would be available and where they would be used were not discussed.
- The city executed agreements with large emergency supply contractors for the provision of various assets during disasters, including generators

Attendees of Meeting with Los Angeles Department of Water and Power

Eric Cote, Powered for Patients	Ellen Cheng, Public Relations
LADWP Representatives	Jazmine Sunico, Lead Account Advisor
Keith Garcia, Emergency Preparedness Coordinator	Mia Rose-Wong, Spokesperson
Juan Esparza, Transmission Distribution District Supervisor	Brian Wall, Media Relations
William Lewis, Lineman	<i>Other Attendees</i>
Lisa Hayes, Emergency Management Coordinator	Carlos Calvillo, Assistant Chief, City of Los Angeles Fire Department

Recommendation: In Phase II, follow-up meetings should be scheduled with SCE and LADWP to facilitate closer coordination between county officials and facilities facing a threat to emergency power and electric utilities. This coordination will be especially helpful in situations where several facilities are facing threats to emergency power when there are limited emergency power assets. In this scenario, knowing that one of the impacted facilities could have its electricity restored faster than another would be a vital piece of information that could inform the decision about which facility should receive a generator.

These follow-up discussions will enable detailed planning around communications protocols between and among utility officials, county and city emergency managers and public health officials. The final protocols should be implemented as soon as practical and eventually incorporated into the LAC Healthcare Facility Emergency Power Resilience Playbook.

Key Phase I Activity: Facilitating Greater Collaboration with the Generator Service, Fuel and Rental Industry in Addressing Threats to Emergency Power

Another key Phase I activity was convening a meeting between LAC EMS Agency leaders, LAC emergency management officials, Powered for Patients, hospital trade association leaders and many of the top generator service, fuel and rental providers in LAC. This meeting, which took place on January 27, 2020, provided a valuable opportunity for industry leaders to share details of their disaster response capabilities along with information about anticipated challenges that could impede their ability to respond to a critical healthcare facility facing a threat to emergency power during an outage.

The meeting also afforded an opportunity for LAC EMS officials and Powered for Patients to brief industry stakeholders on the proposed Early Warning and Status Update protocol. Industry leaders were also briefed on the P.I.O.N.E.E.R. tool and its real time status reporting function that will be developed to enable authorized generator service and fuel providers to make status update entries on behalf of healthcare facility clients through the P.I.O.N.E.E.R. tool's online Dashboard. (See appendix for additional details on meeting, including a list of attendees.)

Further discussions with industry leaders following the January 27, 2020 meeting provided additional detail on the challenges facing the industry, which include:

- Many hospitals do not have contracts in place for rental generators, making it virtually impossible for such a facility to secure a rental generator once a disaster has occurred
- Some of the hospitals that do have contracts for rental generators need to be better educated on what their contract will actually provide in a disaster scenario. For example, some rental contracts have a right of first refusal provision, meaning a hospital with such a clause will be contacted immediately following a disaster to confirm whether they want to commit to the cost of having a rental generator deployed to their facility. If the hospital is unable to immediately commit to the expense of having that asset deployed, it will not likely be available thereafter.
- For fuel suppliers, a common concern expressed was the lack of emergency power to operate pumps at the Kinder Morgan fuel terminals in Los Angeles. Kinder Morgan is the primary bulk supplier of diesel fuel in Southern California. The inability to fill fuel trucks following a disaster due to a lack of emergency power would have a crippling effect on available diesel fuel for hospital generators.
- Service providers noted that some emergency power equipment in hospitals is so old that ordering replacement parts can be very difficult.

Recommendations:

- Create an Emergency Power Industry Working Group as part of the ongoing Powered for Patients Emergency Power Resilience Initiative. This working group will provide a formal structure for future meetings and help facilitate enhanced coordination between county government and industry leaders for pre-disaster planning and disaster response coordination. In addition, a section of the forthcoming LAC Healthcare Facility Emergency Power Resilience Playbook should

address “Important Considerations for Facility Managers in Working with Generator Service, Fuel and Rental Providers”. Industry leaders suggested that this information would help healthcare facilities understand steps they can take to make better use of the resources available from these providers.

- LAC EMS officials should strongly encourage hospitals to invest in generator rental contracts, especially those with single or two generator emergency power systems
- LAC elected leaders, EMS agency leaders and emergency management agency leaders should strongly encourage the Kinder Morgan fuel terminals in Los Angeles to be equipped with quick connect devices to enable rapid deployment of temporary generators during an outage. In addition, Kinder Morgan should be encouraged to secure generator rental contracts. If the company is unwilling to take this step, they should, at a minimum, undertake electrical system assessment work to determine the appropriate size generator(s) needed to enable sustained operations on emergency power. If this step were taken in concert with installation of a quick connect device, LAC officials, and officials from the City of Los Angeles and Long Beach, could consider dedicating some of their existing emergency power assets to support continued operation of this facility (assuming the 800 kw and 200 kw units could be used in some combination to meet the facility’s emergency power needs.)

Summary of Recommendations

- 1) Develop comprehensive **Emergency Power Threat Reporting and Response Protocol** to include an **Early Warning and Status Update Protocol**. This new protocol would provide much-needed clarity in addressing how threats to emergency power at critical healthcare facilities are reported to government and utility officials while detailing response protocols to include how requests for deployment of temporary power and prioritized power restoration should be made by facilities and addressed by government and utilities. The proposed Early Warning and Status Update Protocol will provide an important head start for government officials and utilities in responding to threats to emergency power. Where possible, this early warning should be provided by the P.I.O.N.E.E.R. Tool. In developing this protocol, close coordination with the LAC OEM is recommended to enable alignment between suggested protocols and LAC OEM protocols. In addition, it is recommended that the protocol be submitted for review and formal adoption by the LAC Public Health and Medical Disaster Coalition Advisory Council.

- 2) Develop an **Emergency Power Asset Mutual Aid Protocol**. This protocol would address how the collective temporary power assets owned by LAC and the cities of Los Angeles and Long Beach could be more effectively deployed individually or collectively and under what circumstances. As part of this process, planning should be undertaken to identify specific county and city-owned generators suitable for deployment to specific facilities based on generator size and type. This process will enable faster deployment of pre-identified assets to specific facilities. Consideration of temporary emergency power assets that SCE can make available should also be factored into this mutual aid protocol.

- 3) Embrace recommendations from senior leaders of the U.S. Army Corps of Engineers (USACE) addressing how LAC and the cities of Los Angeles and Long Beach can maximize the impact of its collective fleet of deployable generators. These recommendations include:
 - a. **Appoint a Los Angeles County Power Czar**
 - b. **Encourage investment in quick connect devices to enable rapid connection of temporary emergency power assets**

- 4) Develop **Enhanced Inventory of Hospital Emergency Power Systems**. The information currently required to be collected about hospital emergency power systems does not provide enough information to inform risk assessments about individual facilities that may be at higher risk for emergency power system failures. Current requirements also do not secure enough information to enable decisions about which deployable emergency power assets owned by LAC and the Cities of Los Angeles and Long Beach are suitable for specific facilities. An expanded inventory of hospital emergency power systems will close these gaps and provide other valuable information.

- 5) Create an **Emergency Power System Risk Calculation** for individual hospitals in LAC. This risk rating will give the county's emergency managers and public health officials a better sense of facilities with more vulnerable emergency power systems, which would warrant closer scrutiny during an outage and suggest that the facility may be more likely to require assistance during an extended outage.

- 6) Create an **Allocation of Scarce Emergency Power Resources Assessment Worksheet** for inclusion in the Allocation of Scarce Resources Guide published by the LAC Medical, Health and Operational Area. This tool will help inform prioritization decisions about deployment of limited temporary power assets when requests for support exceed available assets.
- 7) **Stepped-up Engagement with Electric Utilities.** To build on the progress made in the initial face-to-face meetings with SCE and the LADWP, periodic meetings will enable more detailed discussions about how to achieve closer coordination between government officials and utilities in response to a critical healthcare facility facing a threat to emergency power during an outage.
- 8) Create an **Emergency Power Industry Working Group.** Creation of this working group will provide a formal structure for enhanced pre and post-disaster coordination between county government and the generator service, fuel and rental industry. Stepped-up pre-disaster coordination will help mitigate potential challenges impacting the ability of industry to effectively meet the needs of healthcare facility clients. The Working Group will also facilitate closer collaboration during extended power outages, allowing coordination between government and industry around deployment of temporary emergency power assets. This coordination will also facilitate faster response by government officials in addressing obstacles impeding the ability of service, fuel and rental providers to meet the needs of healthcare clients.
- 9) **Strongly encourage hospitals to invest in generator rental contracts,** especially those with single or two generator emergency power systems.
- 10) **Strongly encourage operators of the Kinder Morgan fuel terminals in Los Angeles to be equipped with quick connect devices to enable rapid deployment of temporary generators during an outage.** In addition, Kinder Morgan should be encouraged to secure a rental contract for necessary emergency power. Failing this, Kinder Morgan should undertake electrical system assessment work to determine the appropriate size generator(s) needed to enable sustained operations on emergency power. This would allow county and city officials to determine whether any of their temporary emergency power assets, (the 800 kW or 200 kW units), would be suitable for the facility. Should this determination be made, plans should be made to set the required number of generators aside to supply the facility with necessary emergency power during an outage.

Conclusion

The emergency power resilience initiative launched in May 2019 by the LAC Emergency Medical Services Agency with Powered for Patients has achieved important success in its Phase I work. Among its more notable successes, the initiative has leveraged a unique advantage LAC enjoys relative to other U.S. counties; few, if any other, have a fleet of deployable temporary generators as sizeable as the fleet owned collectively by LAC and the cities of Los Angeles and Long Beach. This unique advantage adds to the value of the multi-phase emergency power resilience initiative as it directly enhances the ability of LAC and its two largest cities to deploy a sizeable fleet of temporary generators without the need for state or federal assistance.

Other successes of Phase I work worth highlighting include:

- Detailed process mapping has helped identify gaps in current preparedness plans relative to addressing threats to emergency power at critical healthcare facilities during power outages. This process mapping has illuminated the need for new protocols to provide much-needed clarity around how threats to emergency power should be reported and collectively addressed by government agencies, utilities and generator service providers. A much needed new protocol identified during Phase I is the proposed Early Warning and Status Update protocol that calls on hospitals to provide an early warning to designated government officials and utilities at the first sign of a threat to emergency power during a power outage.
- The creation of an inventory of deployable county and city emergency power assets has brought much-needed clarity to the available local assets that can be deployed to critical healthcare facilities
- Valuable input from senior leaders of the U.S. Army Corps of Engineers Temporary Power Mission will help LAC and the cities of Los Angeles and Long Beach make better use of their collective fleet of temporary power assets
- The initiation of discussions with SCE and the Los Angeles Department of Water and Power has opened the door to greater pre and post-disaster coordination between these utilities and public health preparedness agencies
- The initiation of discussions with generator service, fuel and rental providers supporting LAC's critical healthcare facilities will enable stepped up and ongoing collaboration that will enhance emergency power resilience in LAC. Through closer collaboration between government and the generator service industry, existing challenges can be more effectively addressed during blue sky days and during disasters. In addition, situational awareness about private sector response to emergency power threats will be enhanced, enabling better decision-making about deployment of government generator assets and prioritized power restoration.

The specific recommendations detailed in this Phase I report build on these important accomplishments and will help ensure that Phase II work to develop new and enhanced protocols advances on a very strong foundation. Individuals with questions about this Phase I report can contact Powered for Patients Project Director Eric Cote at cote@poweredforpatients.org, or by calling 401-374-8500.

Appendix

About Powered for Patients

Additional Details from 1-27-20 Meeting with Generator Service, Fuel and Rental Providers

Life Expectancy Table for Emergency Power System Components

Additional Detail on the P.I.O.N.E.E.R. Tool (Power Information Needed to Expedite Emergency Response)

About Powered for Patients



Powered for Patients is a 501c3 non-profit created after Hurricane Sandy to help safeguard emergency power and expedite power restoration for critical healthcare facilities impacted by disaster. It accomplishes this

mission by fostering increased collaboration and information sharing among government, utilities and critical healthcare facilities and their generator service providers. Since 2014, Powered for Patients has received five rounds of federal funding, including:

- Initial funding from HHS/ASPR, which supported the 2014 inaugural stakeholder meeting of Powered for Patients, attended by numerous federal, state and local officials along with hospital and utility trade association leaders
- Funding through a DHS State Homeland Security Grant from the Rhode Island Emergency Management Agency that enabled the Rhode Island stakeholder engagement initiative and subsequent publication of *Protecting Patients When Disaster Strikes*, an acclaimed Playbook that detailed key stakeholder responsibilities in safeguarding emergency power before, during and after disasters
- DHS Security & Resilience Challenge Funding that resulted in the creation of the P.I.O.N.E.E.R. tool to provide Power Information Needed to Expedite Emergency Response. Future versions of this powerful tool will enable every hospital, skilled nursing facility and large dialysis center in the U.S. to provide real time reports when emergency power is threatened. Reports provided through future versions of the P.I.O.N.E.E.R. Tool can be submitted either through an online manual reporting process or through an automated, real-time reporting process using advanced fault detection technology connected to hospital emergency power systems.
- HHS/ASPR Hospital Preparedness Program Funding from the LAC Emergency Medical Services Agency, which is supporting the recently launched LAC Emergency Power Resilience Initiative
- In September 2019, FEMA enlisted Powered for Patients Project Director Eric Cote to author an addendum Toolkit to a FEMA Guidance document published in 2019 that addresses power outage planning for critical healthcare facilities. Stakeholders using this Toolkit will learn how to minimize threats to emergency power at critical healthcare facilities and expedite government and utility responses when emergency power is in jeopardy.

Powered for Patients has developed important relationships with key federal agencies, including HHS/ASPR, DHS and FEMA. Strong relationships also exist with organizations representing local, county and state emergency managers, public health officials and energy assurance officers, including NEMA, IAEM, ASTHO, NACCHO, and NASEO as well as investor-owned and municipal-owned utilities (Edison Electric Institute and American Public Power Association).

Powered for Patients is led by its founder, Eric Cote, who is supported by a Board of Directors and National Advisors Paul Stockton, former Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, and Pete Navesky, a recently retired U.S. Army Corps of Engineers leader who helped lead the Corps' Temporary Power Mission in concert with FEMA for the past ten years. More information about Powered for Patients is available at www.poweredforpatients.org.

Additional Details of January 27, 2020 Meeting with Generator Service, Fuel and Rental Providers

The following additional details are provided about the January 27, 2020 meeting between LAC EMS officials, a representative from LAC Office of Emergency Management, Powered for Patients, hospital industry leaders and generator service, rental and fuel providers.

Key Highlights from January 27, 2020 Meeting

- Eric Cote of Powered for Patients walked through a PowerPoint presentation that generated questions and comments.
 - o As part of his presentation, Cote previewed the P.I.O.N.E.E.R. tool, a powerful situational awareness tool developed as part of a DHS-funded project that will provide real time alerts to government officials and utilities when emergency power is threatened at a critical healthcare facility during a power outage. Cote explained how generator service and fuel providers will be given access to the tool to provide status updates on efforts to repair or refuel generators at critical healthcare facility sites.
 - o Efforts are underway to launch a pilot test of the P.I.O.N.E.E.R. tool in Los Angeles County. It was suggested to add diesel powered fire pumps to the list of equipment the P.I.O.N.E.E.R. tool can monitor.
- Obstacles and issues cited by generator service providers that could impede their ability to respond to a client with a threatened generator included:
 - George Villasenor, Dixie Diesel, cited challenge of aging units that makes servicing them hard, especially in terms of being able to get parts for them.
 - Walter Holt, Quinn Power noted:
 - o As a union company, crossing picket lines to service a facility generator would be a problem.
 - o He noted that the pressure data centers are applying on our rental fleets is [very significant]. What is priority # 1? Is it the data center or is it the hospital?
 - o Clients need training and an informed staff. Do they know where we're going to be able to park the container with the replacement generator?
 - o Also, what about a bio-hazard scenario at a facility needing service? How do our technicians get the proper PPEs to safely render service? We need to inform the end user [about this potential obstacle]. We can't rely on the end user [customer] to have the PPE.
- Ashu Palta from LAC Emergency Operation Center (EOC), addressed the PPE question. "If we know a vendor is not PPE certified, we'll follow protocols [to get them needed protection]."

- Andrew Salem from Valley Power – We had a client that lost power because a car hit a transformer. Traffic was so bad getting to the facility that it seriously delayed our arrival. This prompted a question from Jaime Garcia from Hospital Association of Southern California (HASC) who asked how the communications would flow in that type of a situation. Ashu Palta, from the LAC EOC, addressed this: “It depends on available escort resources.” He suggested that if that scenario unfolded, the question should go to the County Office of Emergency Management.
- Mary Massey, California Hospital Association – Discussed road block challenges in Northern California during PSPS. “The problem was getting all of the key people approved and getting this information to the officers at the road blocks. It wasn’t happening.”
- Peter Bauman – Aggreko – Utilities will take every available rental unit we have. He described a situation in the San Francisco bay area where rental generators were powering [exhaust fans for] tunnels and they couldn’t meet the needs of critical care customers. He said government can drive this [based on demands they place on rental generators]. He said they pulled non-California generators into assist. He said he can identify California approved generators when needed. He also cautioned about electrical cable shortages.
- April Galindo, Sunbelt Rentals– “We have an emergency response team. We can pull our fleet from the U.S. once we can stop worrying about Tier 4 compliance generators.”
- Andrew Salem – Valley Generator service. “We advise hospitals to get a rental unit on site when a long term outage is expected. He mentions OSHPD. He said one of the challenges was facilities not knowing termination points or facility footprints.”
- Gregg Ryan, Amber Industrial Services, on fueling challenges:
 - It’s important to know key information about a site’s system, such as:
 - Is there a belly tank?
 - Is it a dry break set up?
 - Is there a gravity drop?
 - What is the length of fill from the truck?
 - Are there any tank accessibility issues?
- Efrain Davalos, California Fuels & Lubricants – “Sometimes the racks are empty [and we have to get fuel from other places]. This speaks to identifying where there will be fuel shortages. It was also noted that the San Diego power outage from years earlier provided valuable lessons, among them fuel was running too low in generator tanks and it caused disruptions in emergency power. Also, there was no back up power at critical fuel distribution points.”
- HASC’s Jaime Garcia asked who will deconflict and prioritize generator deployments. Eric Cote provided an initial response and LAC EOC’s Ashu Palta addressed this as well
- It was noted that LADWP has quarterly meetings with California Society of Healthcare Engineering to maintain communications and address coordination protocols with hospitals in the city of Los Angeles

- Paul Ortiz, LAC Internal Services Division spoke about his team’s work in servicing county generators deployed throughout county facilities
- Jim Schachner, Collicutt Energy (MTU service provider)
 - You need to be mindful of transportation issues with our entire industry relying on the same trucking companies to get us what we need. This is a choke point that could result in scarcity of assets.
- It was noted that some hospital clients require security clearances for generator service providers. In a disaster scenario, this may become a challenge if service providers from outside the area are needed to meet the increased service needs during an extended power outage.
- It was noted that quick connect devices (or manual transfer switches) would be the best strategy to enable rapid connection of a temporary generator to a critical healthcare facility (reinforcing recommendations from the U.S. Army Corps of Engineers).
- Chris Sandoval, LA County EMS Agency, noted that the Powered for Patients initiative is also targeting SNFs.

Meeting Recap and Next Steps:

- A request was made for the notes of the meeting, and list of attendees, to be sent to all attendees (completed)
- Address transportation asset choke points
- Consider seeking waivers for electronic logs for truck drivers
- Who is missing that should have be at this meeting?
 - o National Electrical Contractors Association
 - o Utilities
 - o California Society of Healthcare Engineering
- Invite the Mayor of Los Angeles to a future meeting like today’s

Attendees of January 27, 2020 Meeting with Generator Service, Fuel and Rental Providers

First Name	Last Name	Position	Organization
Peter	Bauman	Sales Executive	Aggreko Rentals
Rick	Boatman	VP of fuel distribution	SC Fuels
Eric	Cote	Project Director	Powered for Patients
Terry	Crammer	Chief, Disaster Services	LA County EMS Agency
Lee	Dao	Sales	Quinn Power
Efrain	Davalos	CEO	California Fuels & Lubricants
Rosie	Dominguez	ReddiNet Technical Advisor	Hospital Association of Southern California
Cathy	Donley	Sales Executive	Affordable Generator Services

April	Galindo	Sales Executive	Sunbelt Rentals
Jaime	Garcia	Executive Vice President	Hospital Association of Southern California
Greg	Gardner	Service Manager	Collicutt/MTU Service
Walter	Holt		Quinn Power
Robin	LaFerrara	Sales Manager, Healthcare	SC Fuels
Dave	Lewis		Quinn Power
Jake	Lewis		Quinn Power
Mary	Massey	Emergency Preparedness Director	CA Hospital Association
Mark	Montanya	Sales	SC Fuels
Paul	Ortiz	Generator Service Leader	LA County ISD
Al	Pachecho	Sales Executive	Valley Power Systems
Ashu	Palta	Healthcare Preparedness Liaison	Los Angeles County Office of Emergency Management
Soraya	Peters	Vice President	Hospital Association of Southern California
Laura	Reichert	President	Wood Oil Company
Gregg	Ryan	Sales Representative	Amber Industrial Services
Andrew	Salem		Valley Power Systems
Chris	Sandoval	Program Manager	LA County EMS Agency
Jim	Schachner	Sales Manager	Collicutt/MTU Rental
George E.	Villasenor II	Service Manager	Dixie-Diesel
Bill	Wood	CEO	Wood Oil Company
Scott	Zeigler	Sales Executive	AAA Oils, (California Fuels & Lubricants)

Life Expectancy Table for Emergency Power System Components

Equipment Life Expectancy Table (As detailed in Roadmap to Resiliency, a 2017 white paper co-authored by Powered for Patients and the American Society for Healthcare Engineering)

Item	Life Expectancy
Generators	30 years
Automatic Transfer Switches	25 years
Main Switch Gear	30 years
Emergency Switch Gear	30 years
Paralleling Gear	25 years
Fuel Storage Tanks (above ground)	30 years
Fuel Storage Tanks (below ground)	25 years
Transformers	30 years
Motor Control Centers	30 years

Condition Rating Scale

This Condition Rating Scale, when used in conjunction with the Equipment Life Expectancy Table, can help inform decisions about replacing components of an emergency power system.

A = Like new (more than 75% of life expectancy remaining)

B = Good condition (more than 50% of life expectancy remaining)

C = Average condition (less than 50%)

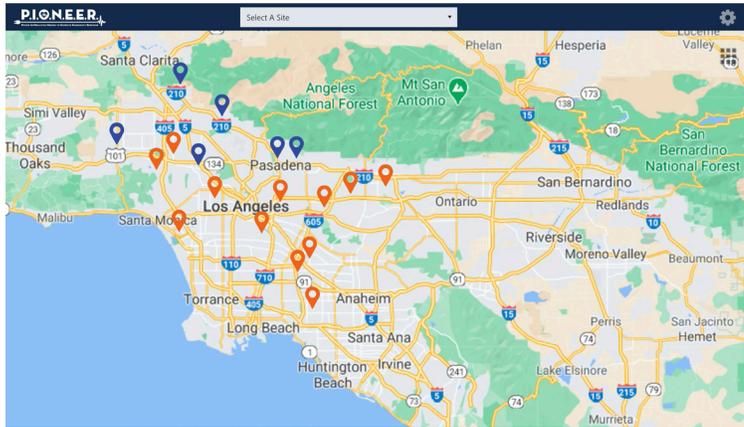
D = Workable condition (nearing end of life)

E = In need of replacement but in no immediate risk of failure or spare parts are readily available

F = In need of immediate replacement (any piece of equipment that exceeds life expectancy stated)

Additional Detail about the P.I.O.N.E.E.R. Tool

In September 2018, the Department of Homeland Security awarded a Security and Resilience Challenge contract to Powered for Patients to develop a prototype that would provide government agencies and utilities with automated and real time emergency power threat reports from critical facilities whose emergency power systems are monitored by Fault Detection and Diagnostic (FDD) technology.



This early, real time warning would enable rapid response by government officials and utilities to support a stricken facility. In such a scenario, every second will count and the automated threat reports from these facilities will spare facility personnel from the task of remembering to notify government officials and utilities of a threat as they scramble to respond.

Hundreds of hospitals in the U.S., and hundreds more critical infrastructure facilities such as water treatment plants, wastewater treatment plants, data centers, research facilities in national labs and universities and public safety facilities have FDD technology installed on their emergency power systems. The DHS-funded prototype was designed to ingest these data feeds from multiple providers and synthesize them into a single dashboard with a red, yellow green threat level indicator. The prototype was also designed to receive manually submitted, real time threat reports from facilities not currently using Fault Detection and Diagnostic technology to monitor their emergency power system. In advance of completing the DHS-funded prototype, expected in 2022, Powered for Patients developed an initial version of a similar tool called Power P.I.O.N.E.E.R. P.I.O.N.E.E.R. stands for Power Information Needed to Expedite Emergency Response.

During Phase I of the Los Angeles County Emergency Power Resilience Initiative, Powered for Patients project director Eric Cote discussed deploying the P.I.O.N.E.E.R. tool with the LAC EMS Agency as one of the first pilot deployments in the nation. LAC EMS Agency was supportive of this deployment, for not only hospitals using FDD technology, but for other critical infrastructure in Los Angeles County that use FDD technology for their emergency power systems.

Since that initial conversation between Eric Cote and LA County EMS Agency, development of the P.I.O.N.E.E.R. tool has accelerated and as of July 2020, the first operational version of P.I.O.N.E.E.R. was ready for wide-scale deployment, both in Los Angeles and around the nation. This initial version will only report threats detected by Fault Detection and Diagnostic equipment. In situations where FDD equipment is connected to a facility's HVAC system, P.I.O.N.E.E.R. will also be able to provide real time reports on HVAC status for a facility operating on emergency power.

The next generation of the P.I.O.N.E.E.R. tool will include the manual reporting function and an expanded status update function. When this version is available, all hospitals and SNFs in LAC will be

able to use P.I.O.N.E.E.R. to report threats to emergency power, regardless of whether they are using FDD technology to monitor their emergency power systems. The expanded status update function of this version of P.I.O.N.E.E.R. will enhance the ability of government officials, healthcare facilities, utilities and generator service and fuel providers to enter real time status updates about their response activities into the P.I.O.N.E.E.R. Tool's online dashboard.

The loss of emergency power in a hospital or skilled nursing facility with a single generator treating patients depending on ventilators could represent a life-threatening emergency. Ventilator patients in these facilities would have to be kept alive by the backup battery for their device. When the backup battery is depleted, usually after a 3-hour period assuming a fully charged battery, manual operation of ventilators by staff would be required until emergency power or utility power could be restored or until an evacuation of ventilator patients to a nearby facility with power could be achieved.

Of the 79 Los Angeles County hospitals that receive funding from the HHS Hospital Preparedness Program, 12 of them, or 15 percent, rely on a single generator for their emergency power system. It is believed that all 58 sub-acute SNFs in Los Angeles County also rely on a single generator emergency power system. Seven of these 58 sub-acute SNFs have been designated as uniquely critical given their risk of being impacted by Public Safety Power Shutoffs (PSPS) and the presence of ventilator patients in these facilities.

Given that PSPSs are expected to continue in California, deployment of the P.I.O.N.E.E.R. tool to single generator hospitals and SNFs in Los Angeles, and throughout California, is being officially proposed by Powered for Patients as part of a broader Power Resilience Blueprint for America. The Power Resilience Blueprint was inspired by the COVID-19 pandemic and has been developed by Powered for Patients and another 501c3 non-profit, the Electric Infrastructure Security Council. In addition to recommending the deployment of the P.I.O.N.E.E.R. tool to all single generator hospitals and skilled nursing facilities in the U.S., the Power Resilience Blueprint also calls for funding initiatives like the LAC Emergency Power Resilience Initiative elsewhere in the country.

Deployment costs for the P.I.O.N.E.E.R. tool include a one-time cost of \$3,000 per facility for emergency power monitoring and an annual \$275 fee for technical support, periodic testing and software updates. Adding HVAC reporting capabilities to a facility using P.I.O.N.E.E.R. to monitor emergency power would add a one-time cost of \$2,000 and an additional \$200 annual fee for technical support, periodic testing and software updates. Initial, one-time costs for deploying the P.I.O.N.E.E.R. tool to monitor emergency power in Los Angeles County's 12 single generator hospitals that participate in the Hospital Preparedness Program would be \$36,000

In October 2020, the LAC EMS Agency sought the authorization needed to use a portion of its HPP funds to cover the cost of deploying the P.I.O.N.E.E.R. tool to the county's single generator HPP hospitals. Funding for P.I.O.N.E.E.R. deployment to the county's sub-acute SNFs will be sought from other sources.