Eric Cote: Emergency Power Resilience Expert

Over the past decade, Eric Cote has developed a deep understanding of the threats facing emergency power systems operating during extended power outages at critical infrastructure facilities. Cote has leveraged this insight to develop cutting-edge approaches to safeguarding emergency power and accelerating government, utility and private sector response when emergency power is threatened during power outages.

This expertise has been called on by government agencies, engineering firms and emergency management consultants working to protect those who depend on the continued operation of critical facilities during power outages.

This overview details Cote's unique work as an emergency power resilience expert and highlights the capabilities he brings to private and public sector initiatives focused on power reliability.

Addressing a Persistent Threat

For many years, and with plenty of recent examples, emergency power systems in critical healthcare facilities have suffered partial or total failures when called upon during extended power outages.

Hurricane Sandy led to the failure of emergency power systems in six New York City area hospitals, prompting four emergency evacuations. Emergency power failures in New Orleans following Hurricane Katrina were blamed for patient fatalities. More recently in California, when utilities initiated pre-emptive Public Safety Power Shutoffs to minimize the risk of wildfires triggered by transmission lines, multiple failures of hospital and nursing home generators occurred.

Cote has documented a number of these failures in detailed case studies that pinpoint the cause of failures and highlight important lessons learned to help other facilities minimize the risk of similar losses.

Despite this persistent threat to emergency power, most jurisdictions in the United States have not done the intensive planning work needed to effectively assess emergency power vulnerability and enable accelerated and collective government, utility and private sector response when emergency power is threatened during an extended power outage. Among the unaddressed emergency power vulnerabilities is the real threat of a serious shortage of temporary emergency power assets in a major disaster that produces a widespread and prolonged power outage impacting millions of Americans.

Cote has addressed this lack of planning by creating the Power Resilience Blueprint for America in partnership with the Electric Infrastructure Security Council. The Blueprint is a bold and much-needed policy document and action plan that addresses our nation's energy security and emergency power preparedness shortcomings. (Details provided below).

Honing Best Practices

Eric Cote has been working for years with government and private sector stakeholders to significantly bolster emergency power preparedness planning across the U.S. In doing so, Cote has become one of the foremost experts in assessing a jurisdiction or health system's current protocols, identifying gaps and developing innovative solutions to enhance emergency power resilience planning and response capabilities.

A cornerstone of Cote's approach has been promoting adoption of best practices in maintenance of emergency power systems and facilitating unprecedented levels of information sharing and coordination between government, utilities, healthcare facilities and service providers. The result of this approach is an accelerated, collective response when threats arise during extended power outages.

Among the most impactful protocols Cote has developed is an early warning and status update protocol that calls on critical healthcare facilities to notify designated government and utility points of contact at the first sign of a serious threat to emergency power.

This early warning and subsequent status updates enable accelerated response by service providers, fast-tracked deployment of government generators and, when possible, expedited restoration of utility power before emergency power is lost. Success by service providers, government agencies and utilities in their respective efforts to aid a stricken facility helps protect patients, especially those most vulnerable during a hasty emergency evacuation.

With funding from the Department of Homeland Security, Cote and a team he led developed Power P.I.O.N.E.E.R., a powerful new situational awareness tool that automates the process of notifying designated officials at the first sign of a threat to emergency power during an outage. This breakthrough technology will be a gamechanger and is expected to fundamentally shift the way critical facilities across the country report threats to emergency power to service providers, government officials and utilities.

More recently, Cote developed a new proposed protocol to help hospitals and skilled nursing facilities better prepare for a scenario involving the potential loss of emergency power at a time when the facility has patients dependent on electric-powered medical devices.

In the course of his work advancing emergency power resilience, Cote has developed deep knowledge of the FEMA Temporary Power Mission and how it intersects with the work of state and local emergency managers in responding to requests from critical facilities for deployment of temporary emergency power assets during federally declared disasters. This understanding has enabled Cote to help local jurisdictions better manage non-federal temporary power assets, accelerate their ability to receive FEMA assets and create frameworks for the rationing of limited emergency power resources.

Protecting Critical Facilities Beyond Healthcare

Cote's expertise in emergency power resilience planning is deployed on behalf of Powered for Patients, a 501c3 non-profit created after Hurricane Sandy to help better safeguard emergency power in critical healthcare facilities. Powered for Patients has received five rounds of federal funding to support multiple emergency power resilience initiatives.

Cote also works as a consultant to government agencies, NGOs, engineering firms and private healthcare systems that have directly engaged him to conduct emergency power assessments, develop emergency power resilience plans and create emergency power resilience planning resources. Since threats to emergency power are common across all types of facilities, Cote's expertise is being leveraged beyond the healthcare sector to address emergency power resilience challenges facing other types of critical infrastructure, including public safety facilities such as 911 call centers, police and fire stations, water and wastewater treatment plants, data centers, etc.

Cote's expertise is also being tapped to develop new approaches to address the needs of individuals with disabilities who rely on electric-powered medical devices in their homes.

Emergency Power Resilience Support/Services Provided by Eric Cote

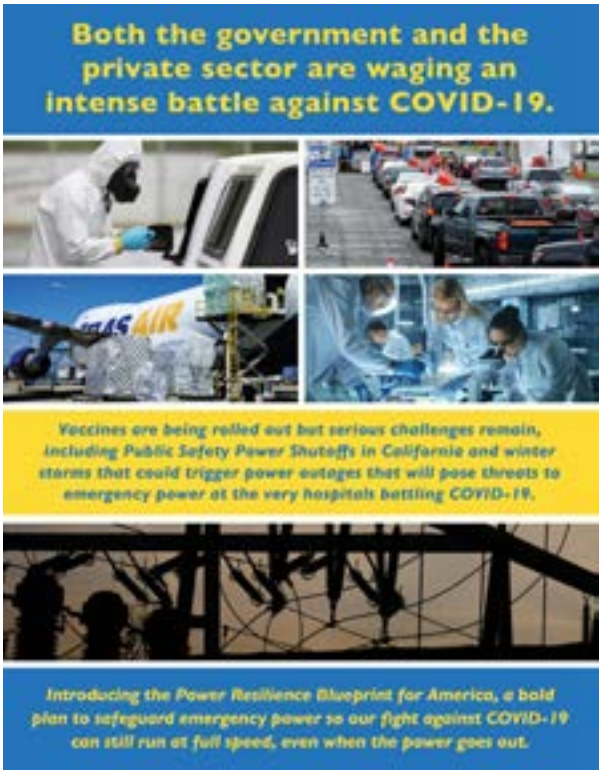
- Work with jurisdictions to develop and implement comprehensive emergency power preparedness initiatives that enhance preparedness and response capabilities
- Hazard vulnerability assessments for critical facilities as they relate to addressing threats to emergency power, including a review of communication and coordination protocols with internal and external parties, i.e., government officials, utilities, generator service, fuel and rental providers
- Review of a facility's emergency power system to inform assessment of current level of emergency power resilience, with a focus on:
    - Identification of emergency power system components approaching the end of their useful life
    - Identification of operational vulnerabilities associated with older equipment and development of mitigation strategies to minimize risk prior to a facility's replacement of an aging emergency power system
    - Distributed emergency power system capabilities to deliver emergency power across a campus (rather than having emergency power from a generator available only to the building in which the generator is connected)
    - Fuel system review (presence of common tanks and/or individual tanks for specific generators)

- Load shedding capabilities in the event of a partial loss of emergency power
- Presence of quick connect devices to allow rapid connection of a temporary, portable generator
- Use of fault detection and diagnostic monitoring systems
- Additional Support for Healthcare Facilities
    - Assessment of compliance with CMS Emergency Preparedness Rule
    - Liaising with government officials and utilities to assess existing plans for prioritization of facility for power restoration to include assessment of existing protocols (or lack thereof)

- Working with facility management personnel to review current practices in safeguarding emergency power systems and identifying opportunities to incorporate best practices into maintenance protocol

Overview of Eric Cote's Current Emergency Power Resilience Projects

Power Resilience Blueprint for America



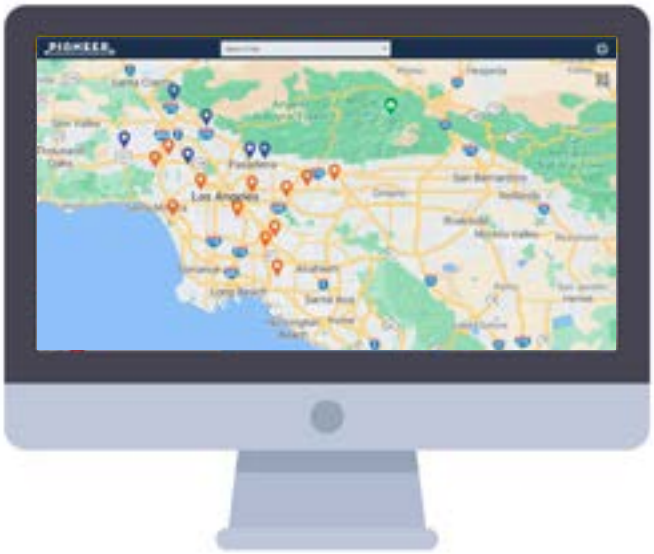
The Power Resilience Blueprint for America is a bold plan inspired by the COVID-19 pandemic that addresses immediate and longer-term emergency power vulnerabilities and the need for increased energy security and emergency power preparedness planning across the nation.

The Blueprint was developed by Cote in partnership with the EIS Council to tackle the complex scenario of an ongoing fight against COVID-19 at a time when Public Safety Power Shutoffs in California and natural disasters significantly increase the likelihood of power outages that in turn elevate the threat of emergency power failures. Such failures at a time when so many Americans require the use of ventilators to battle COVID-19 could prove life-threatening.

The Power Resilience Blueprint calls for deployment of the new Power P.I.O.N.E.E.R.® Tool to help prevent or mitigate expected failures of emergency power in critical facilities relying on a single generator. The Blueprint also addresses the pandemic's painful lesson of resource scarcity by offering solutions to address the likely shortage of emergency power assets in a future catastrophic power outage while bringing major new efficiencies to the deployment of temporary emergency power resources.

While developed initially to address emergency power vulnerabilities heightened during the COVID-19 pandemic, the Blueprint is a long-term plan to help the nation better address all threats to energy security while dramatically enhancing the nation's emergency power preparedness.

Power P.I.O.N.E.E.R.®



In September 2018, the Department of Homeland Security awarded a $300,000 contract to Powered for Patients and a technology partner, Talus Analytics, to develop a new tool that would leverage fault detection and diagnostic (FDD) technology connected to emergency power systems in critical healthcare facilities. The tool enables the first-ever automated, real-time warning of government officials and utilities at the first sign of a serious threat to emergency power during a power outage.

FDD technology acts like a heart monitor for a patient, capturing key data points about an emergency power system in real time and transmitting warnings to designated officials. The project concluded with creation of a prototype that successfully ingested and synthesized FDD data feeds from three FDD manufacturers and displayed threats to specific facilities on an online dashboard.

The COVID-19 pandemic highlighted immediate threats to COVID-patients dependent on ventilators during power outages, especially those in single-generator hospitals. This threat underscored the lifesaving role automated emergency power system monitoring and threat reporting could play in minimizing risks to ventilator patients.

This led Cote to create an initial version of the emergency power monitoring tool that could be deployed immediately pending completion of the DHS prototype. Cote worked with Blue Pillar, one of three companies that helped develop the DHS-funded prototype, to launch the Power P.I.O.N.E.E.R.® Tool. P.I.O.N.E.E.R. stands for Power Information Needed to Expedite Emergency Response.

In addition to its automated, real-time alerts to designated individuals, P.I.O.N.E.E.R. provides a secure, cyber-protected online dashboard where authorized personnel can view detailed information about unfolding mechanical threats or low fuel levels. P.I.O.N.E.E.R. can also monitor HVAC system status in real time and provide warnings of dangerously rising temperatures in patient care areas. The highly detailed information available on the P.I.O.N.E.E.R. dashboard can help facility personnel and service providers diagnose mechanical problems remotely that may not be readily apparent based on a visual inspection of failing equipment. Real-time dashboard updates from response personnel also keep officials in the chain of command apprised of response efforts and help inform resource deployment decision-making.

Initial P.I.O.N.E.E.R. deployments are slated for Los Angeles County's single-generator hospitals using HHS Hospital Preparedness Program funding given the recent resumption of Public Safety Power Shutoffs, pre-emptive steps taken by Southern California Edison to reduce the risk of wildfires sparked by live transmission lines.

Subsequent editions of P.I.O.N.E.E.R. are slated for release in late 2021 and beyond.

Los Angeles County Emergency Power Resilience Initiative

In May 2019, the Los Angeles County Emergency Medical Services Agency executed a contract with Powered for Patients to lead a multi-phase, multi-year emergency power resilience initiative focused on critical healthcare facilities.

Phase I was completed in September 2020 and encompassed an assessment of current emergency power threat reporting and response protocols used by hospitals and skilled nursing facilities when emergency power is threatened during an outage. This assessment included a review of all relevant local, county and state emergency preparedness plans to evaluate government protocols for responding to threats to emergency power and requests for temporary emergency power support from an impacted healthcare facility. This important review enabled identification of gaps in response protocols and fueled development of new protocols to better safeguard emergency power and expedite government and utility response when emergency power is threatened during an outage.

Phase I also involved creation of an inventory of deployable emergency power assets owned or rented by Los Angeles County, the City of Los Angeles, the City of Long Beach and Southern California Edison (SCE), along with a review of existing protocols that govern the deployment of these assets.

An evaluation of emergency power systems at Los Angeles County-area hospitals enabled identification of potential vulnerabilities associated with certain systems, including those that rely on a single generator. Phase I also saw stepped-up coordination with Southern California Edison 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 an outage.

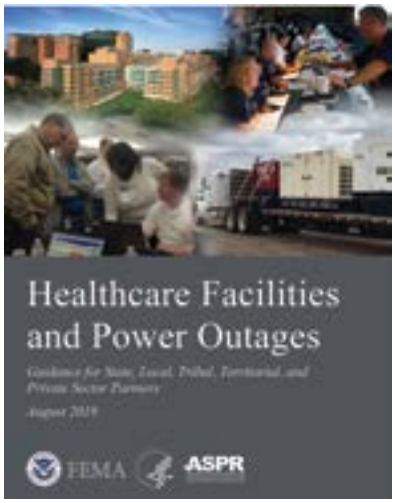
Phase I work also included creation of a new partnership between LA County's generator service, rental and fuel providers and Los Angeles County's public health preparedness and emergency management agencies. This partnership was formalized as the LA County Emergency Power Industry Working Group, which will help advance enhanced public-private sector planning to optimize deployment of generator assets during extended outages.

Phase II of the initiative was launched in September 2020 and is focused on implementing key recommendations from Phase I, including the creation and dissemination of an early warning protocol for hospitals and skilled nursing facilities at the first sign of a threat to emergency power during an outage. With the recent resumption of Public Safety Power Shutoffs in California to reduce the risk of wildfires sparked by utility transmission lines, this early warning protocol will add an important safety precaution for patients. As part of this new protocol, the P.I.O.N.E.E.R. Tool is being made available to Los Angeles County's single-generator hospitals participating in the HHS Hospital Preparedness Program to automate this early warning.

Prior Examples of Eric Cote's Public and Private Sector Work Advancing Emergency Power Resilience

Public Sector Initiatives

FEMA Emergency Power Resilience Toolkit



In 2018, Congress enacted the Disaster Recovery Reform Act, which included a section calling for the Federal Emergency Management Agency (FEMA) to develop training and resource materials to help state, local, tribal and territorial (SLTT) governments coordinate better with hospitals, nursing homes and utilities in planning for power outages. In response, FEMA published *Healthcare Facilities and Power Outages: Guidance for State, Local, Tribal, Territorial, and Private Sector Partners* in August 2019, which provides guidance on healthcare facility preparedness standards and challenges; ways to integrate emergency preparedness efforts throughout communities; and methods for prioritizing assistance to healthcare facilities during power outages. Eric Cote provided editorial review and content recommendations that were incorporated into the guidance document.

In September 2019, FEMA enlisted Cote to author an addendum Toolkit to the FEMA Guidance document that provides a deeper look at emergency power resilience issues. The Toolkit provides guidance and resources to SLTT governments as well as facility managers and utility companies for use before, during and after disasters. 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 threatened.

Amid the COVID-19 pandemic, a review of the draft Toolkit by the Department of Health and Human Services has been delayed. As a result, publication is expected later in 2021.

Rhode Island Emergency Management Agency

In 2016, the Rhode Island Emergency Management Agency (RIEMA) retained Powered for Patients to launch a comprehensive emergency power resilience initiative to assess existing protocols in addressing threats to emergency power. During this initiative, Eric Cote facilitated extensive stakeholder engagement between RIEMA, the Rhode Island Department of Health and the state's hospitals and electric utility. Cote recommended adoption of an early-warning protocol at the first sign of a serious threat to emergency power, which was voluntarily adopted by Rhode Island's hospitals. His work culminated in the publication of *Protecting Patients When Disaster Strikes*, a heralded playbook on safeguarding emergency power and expediting prioritized power restoration for critical healthcare facilities.

Private Sector Initiatives/Clients

Converge Strategies

In 2020, Converge Strategies, a consulting firm that works to accelerate energy innovation to keep America secure, tapped Eric Cote's emergency power resilience expertise to support different client engagements that included a focus on power outage planning. Cote's in-depth knowledge of the CMS Emergency Preparedness Rule and his deep understanding of relevant safety codes governing emergency power system design helped inform the recommendations and reports Converge Strategies developed for its clients.

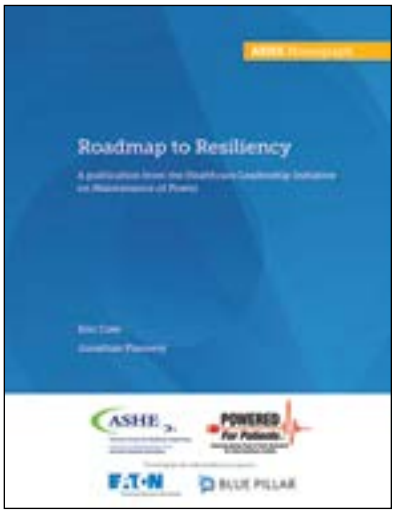
Expert Testimony in Wrongful Death Case

In 2020, Eric Cote was retained by a west coast law firm to provide expert testimony in a wrongful death case involving a patient who died while undergoing emergency surgery in a hospital that initiated an emergency power test during the surgery. The test triggered an unexpected failure of an uninterrupted power supply (UPS) device in the surgical suite where the surgery was being performed. Tragically, the generator being tested also failed, eliminating a source of backup power that would have restored power to the surgical suite and enabled the life-saving surgery to continue. Cote provided testimony about required maintenance and testing protocols for UPS devices and emergency power systems dictated by relevant NFPA codes and accepted best practices. He also reviewed detailed information about the incident to identify failures around notification of clinical personnel prior to the initiation of emergency power tests. Cote's testimony was instrumental in securing a substantial financial settlement for the deceased's widow.

Hagerty Consulting

In 2018, Hagerty Consulting, a leading emergency management consulting firm, hired Eric Cote to help support the firm's work for a large healthcare provider on the west coast of Florida. The healthcare provider hired Hagerty following Hurricane Irma to conduct a thorough review of its emergency preparedness plan and make recommendations on needed plan enhancements as well as necessary upgrades to the facility's emergency power supply system. Cote's expertise was tapped to help guide Hagerty's recommendations on emergency power system enhancements.

Roadmap to Resiliency



In 2017, Eric Cote co-authored *Roadmap to Resiliency*, a comprehensive white paper developed with the American Society for Healthcare Engineering (ASHE) that chronicled many examples of emergency power system failures across multiple disasters. The white paper also detailed best practices in minimizing threats to emergency power, including the early-warning protocol Cote had first introduced in *Protecting Patients When Disaster Strikes*.

Roadmap to Resiliency has become an important emergency power resilience resource for hundreds of hospital facility managers and emergency preparedness coordinators across the country.

ARUP

In 2017, the global design and engineering firm Arup hired Eric Cote to be part of an Arup-led team retained by the Massachusetts Office of Energy Resources to conduct electrical power system assessments at state medical facilities across the Commonwealth. The assessments were intended to evaluate the facilities' suitability for use of alternative energy technologies while also reviewing the facilities' emergency power system capabilities. Key expertise that Cote brought to this engagement was his deep understanding of the recently enacted CMS Emergency Preparedness Rule, a new federal requirement from the U.S. Department of Health and Human Services dictating new requirements for emergency power system planning for healthcare systems.

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