When Disaster Strikes: Critical On-Site Cogeneration Issues Relating to Reliability & Liability

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ABSTRACT

Widespread disasters in recent years such as Hurricanes Katrina and Sandy have focused attention upon the reliability of, and possible legal issues relating to, on-site generation. This article focuses upon on-site generation, such as synchronous cogeneration, which can start when the grid is down, and other emergency back-up generation that has the capacity to function during an electric distribution outage. Cogeneration has the economic advantage of providing baseline electric and thermal energy to the facility whether or not the grid is operational. Here we concentrate on cogeneration and generation at healthcare facilities and within multi-occupant residential dwellings and discuss certain legal consequences arising as a result of failing to provide on-site power when required to do so by law. We also discuss the potential consequences resulting from the installation of cogeneration in multi-occupant residential buildings when the owner has no legal obligation to make such an installation, and how such consequences, including obligations that arise, can be addressed and potential legal liability mitigated.

BACKGROUND

Hurricane Sandy and previous hurricanes and other natural disasters have caused widespread damage and prolonged outages at healthcare facilities and multi-occupant residential dwellings as well as at virtually every other type of building. Although there are significant differences between healthcare facilities and multi-occupant residential dwellings, they share the common element of being occupied by residents on a 24/7 basis. The latter can include multi-family dwellings, hotels, dormitories and other residential buildings.

HEALTHCARE FACILITIES

Loss of power at healthcare facilities such as hospitals and extended-care facilities poses a significant threat of loss of life or harm to patients. Critical elements at such facilities include operating rooms, intensive care units, and life support equipment but many other functions such as lighting, heating, cooling, communications, and elevators are also essential. State regulators recognize the importance of uninterrupted power to healthcare facilities by requiring them to have on-site back-up power. For example, the New York State Department of Health requires each hospital and nursing facility to have an established plan of emergency electric service in the event of an electrical system failure. It also requires compliance with the applicable Department of Health Guidelines for Design and Construction of Hospital and Healthcare Facilities. Hospitals and nursing facilities typically satisfy these requirements by having on site back-up generation interconnected to the utility grid or separated from the utility grid by a transfer switch that will switch to and activate on-site power upon any loss of utility power. These units are required to be tested periodically.

In the event of a loss of grid power during which the on-site generation fails to continue to operate or, if it is back-up generation, fails to activate, those affected may have limited recourse against the electric utility. Electric utilities often operate under tariff provisions that limit their liability to gross negligence. In addition, an electric utility may have the right under its tariff to cut power (load shed) to a portion of its service territory to protect the overall distribution system from experiencing a power blackout without exposing the utility to liability to customers within the "cut" area—provided that the utility handles the load shedding prudently in accordance with its tariff. State laws and regulations, however, can provide a measure of protection by limiting a utility's ability to cut power to healthcare facilities. This might protect a hospital against outage by a utility that is voluntarily shedding load in a power emergency to prevent a grid collapse.

Even if the utility is found to be liable, based upon the author's experience in the past, recovery is likely to be very limited. The limits of such utility liability, however, are being tested in the aftermath of Hurricane Sandy. Many post-Sandy lawsuits have been filed in Nassau County, NY, against the Long Island Power Authority (LIPA) and National Grid. The underlying billions of dollars of claims are for com-

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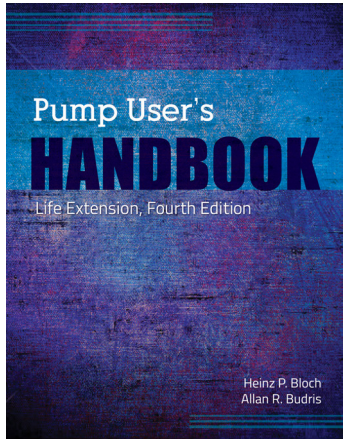

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pensation relating to destroyed facilities, buildings, homes and other structures on the grounds of failure to disseminate adequate warnings, establish competent emergency management systems and maintain power distribution equipment. The extent of liability on the part of LIPA and the National Grid remains to be seen.

To what extent can a healthcare facility rely upon agreements with manufacturers and maintenance providers? Manufacturers' or installers' warranties for installed back-up generators or synchronous cogeneration units may be as little as one year, and they might only require the provider to supply equipment, parts and labor to restore the generator to working order. In fact, the sales agreement might well include a provision limiting the liability of the manufacturer. A maintenance provider will have emergency response obligations but these would not include mandatory operation of a generator (or key portions of the generation system or its fuel supply) that is flooded.

Specific cases illustrate the issues confronting healthcare facilities. Hurricane Sandy caused several hospitals to be wholly or partially without power as a result of the failure of on-site generation. Since insufficient time has passed since that hurricane to see its legal consequences, it is worthwhile to look back a case that arose out of a prior weather disaster, Hurricane Katrina. One case arising out of Hurricane Katrina involved a life-support ventilator system that failed as a result of the flooding of New Orleans and resulted in the death of a 73-year-old hospital patient, Althea LaCoste. In that case, the plaintiff claimed that the Pendleton Methodist Hospital in New Orleans should have located a back-up generator and related equipment above the flood level before Hurricane Katrina. Doctors and nurses attempted to provide care by manually operating life-support machinery and by evacuating patients without elevators, but the task proved overwhelming. The hospital argued that its emergency generation satisfied all applicable codes and standards and that it had a well-developed emergency system, but that it was impossible to be completely flood-proof—particularly when faced with one of the greatest natural disasters in American history.

The Louisiana Supreme Court ruled that LaCoste's family could sue the hospital for negligence, with no cap on damages, instead of for medical malpractice, for which claims were limited to $500,000. This case was settled, but, depending on state laws, a similar argument might be raised again in other states. This theory of general tort liability against healthcare institutions predicated upon their installation

of emergency generation that fails to operate in a widespread disaster has led hospitals and other healthcare facilities to review their back-up generation capabilities. However, as seen from Hurricane Sandy, healthcare facilities were subject to the same consequences as experienced in Hurricane Katrina when the electric grid failed and flooding conditions overwhelmed the backup generation.

Potential liability from insufficient disaster preparedness presents a special challenge to specifying engineers and hospital administrators:

- Healthcare facility operators who meet no more than the required regulations and oversight organization standards must also be prepared for after-the-fact allegations that the operator should have gone beyond such standards. An important issue in lawsuits such as this is to what extent healthcare operators can be held liable for not effectuating measures that exceed such regulations and standards

- Existing standards, or at least recommendations, are constantly being reassessed in response to these realities. The Joint Commission accredits the majority of American hospitals. The Joint Commission Resources (JCR) continually hosts conferences aimed partly at helping hospitals to improve strategies to render high quality care and increase patient safety. At this organization's 2014 conference, hospital response to emergencies such as tornadoes, generator failures and hurricanes can support health care disaster recovery efforts.

- If a healthcare facility in New York State loses power and fails to meet its legal requirements to have back-up power or is negligent in carrying out its emergency plan, the owner and operator are subject to possible administrative penalties and fines and possible loss of their operating license in the event of casualty or death.

The tragic events caused by Sandy, Katrina and other events during which a loss of grid power negatively impacted clinical operations (such as Hurricanes Irene in 2011, Rita in 2005, and Ivan and Jean in 2004, and the Northeast blackout in 2003), combined with the increasing role of electronic equipment in critical patient care have led to a reassessment of what should be taken into account when installing hospital

emergency generation. Such considerations include which steps are necessary to protect existing emergency generation against potential disasters (such as elevating generators above possible flood levels), providing fuel storage that anticipates lengthy grid outages, and determining the appropriate duration of grid outage to protect against. All these considerations are still necessary, in spite of the fact that some of these disasters were long ago.

A problem in assessing the extent of possible liability is that while some dangers may be present and known, such as an earthquake in Los Angeles or a flood in New Orleans, the probability of such events occurring may be low. For example, a flooding event similar to the one caused by Sandy had not previously occurred in the modern history of New York City, largely as a result of the magnitude of the storm. The low likelihood of some disasters complicates the disaster planning since the process must necessarily include 50- or 100-year events that may bring disasters far into the future. How should a hospital weigh improbable events when making costly renovations to its existing generation system or adding cost to a new installation, especially since the severity of the consequences of the event is also unknown?

The NYU Langone Medical Center assured NYC authorities that it had tested its equipment and was prepared for the storm. However, during and after Sandy, NYU Langone experienced large-scale power failures in areas including the emergency rooms, the transplant unit, and labor delivery. The failure of emergency systems led staff to connect patients to battery-operated monitors and pumps. As emergency generation continued to fail, the entire hospital had to be evacuated. One of the patients was Kenneth Langone, chairman of NYU Hospital. According to Mr. Langone, the hospital anticipated that its back-up generators would work in spite of the size of the forecasted hurricane. He was a patient in the hospital at the time, and said, "Do you think they'd have kept me in there if they thought I was going to be unsafe?" He was evacuated along with everyone else. [http://www.huffingtonpost.com/2012/10/30/nyu-hospital-generators-hurricane-sandy_n_2046041.html]

The disconcerting reality confronting hospitals is that the cost of not anticipating disasters might be far greater than the cost of providing appropriate protection for their emergency generators and sufficient fuel for prolonged operation. Healthcare facilities should now take potential liability into account in any cost-benefit analysis of providing

protection for their emergency generation systems and providing for a sufficient on-site supply of fuel.

A consequence of our system of law is that, regardless of their likelihood, certain risks may be elevated above others as a result of liability. Despite the fact that a continuous supply of electric power is important to virtually every aspect of a healthcare facility's ability to provide patient care, it is clear that additional monies invested in emergency generation systems to protect against remote disaster events might well detract from a hospital's ability to provide other urgently needed services. While there is no ready solution to this problem, engineering, medical and legal evaluation of the risks and possible remedies is essential.

MULTI-OCCUPANT RESIDENTIAL BUILDINGS

In the wake of the prolonged outages that occurred as a result of Hurricane Sandy, and in an effort to become better equipped to weather future storms, multi-occupant building owners throughout the New York City region have installed, or are installing, emergency generators or cogeneration (which can also provide day-to-day electric service).

While these generators can provide vital protection for persons and property against electric grid failures, building owners should be aware that, even if the unit is properly permitted and installed in accordance with applicable regulations and utility requirements, these units might also expose tenants to possible harm and owners to potential legal liability and property damage. Apartment building and hotel owners do not enjoy protections against liability on a par with electric utilities whose tariffs, as noted, generally limit liability to cases in which the utility has committed gross negligence.

To avoid adverse consequences, owners, building managers and tenants must understand, at a minimum, how the installed units will operate and which of the buildings' electric systems will be powered during an outage. In addition, the owners must put in place appropriate legal protections. A few examples of what could go wrong include the following:

- Tenants rely upon their expectation of back-up generation and do not evacuate in the face of a storm. The generation unit fails, and

tenants sue the owner for damages suffered, which could have been avoided by preparing for an electric outage and evacuation.

- An apartment building's advertisements include a statement that its on-site generator will protect against blackouts. A tenant with a home business moves in and, in reliance upon the back-up generator, doesn't install an uninterruptable power supply (UPS) battery to avoid loss of system data from a sudden grid shutdown. The generator functions, but, as designed, only serves vital building systems such as the elevators and common area lighting, but not plug load, lighting or appliances within individual apartments. The tenant seeks damages stemming from lost data.

- A tenant reliant upon an electrically powered medical device for life support moves in, with the expectation that the building will provide electricity in the event of a grid outage. The generator, installed in the basement, is flooded during the outage, with serious medical or fatal consequences.

- The proper operation of an internal power system requires power quality controls. Potential problems may include conditions such as under and over-voltage, voltage flickers and harmonic distortion. In the event that a voltage problem or other condition damages tenant equipment, the tenants may demand that the owner cover their losses.

Owners and managing agents must understand which building electric systems will receive power from on-site generation if the grid goes down. These should ideally include exit signs and lighting in all means of egress, emergency communication systems, fire detection, alarm and fire extinguishing systems (such as sprinklers), water, sewage and sump pumps, refrigerators, freezers, basic elevator service, minimal general lighting (including lighting in the generation area) and equipment for maintaining telephone service. If the generator fuel is diesel fuel (or other delivered fuel), there should be safe and sufficient on-site storage for extended operation. Also, even if, when installed, the generator is sized to handle the entire emergency load, has equipment been added which puts the emergency electric demand above the capacity of the generator?

Tenants must be informed as to which building systems will be powered by the generator and which will not, and they must understand the circumstances in which the generator may not be able to operate, such as a flood. Other areas of concern that must be considered are:

- If a cogeneration unit is installed, is it synchronous; is it capable of "black start" so that it can start when the grid is down? In New York City, Con Ed does not permit synchronous generation to be installed in certain networks, so an assumption should not be made that cogeneration installed for the purpose of reducing the cost of electricity can also operate in the event of a grid outage.

- Emergency procedures must be established, and building personnel must be trained to know what to do in the event of an emergency.

- The consulting engineer and the installer of the system have detailed information about the generator—this information must be communicated in an understandable manner to the owner, the managing agent and the tenants.

- The ability of an owner or managing agent to protect against liability by contracts with an installer, manufacturer, maintenance or remote operation\monitoring provider can prove to be limited. Also, tenant waiver may not always avoid legal liability. For that reason, the first line of protection resides in proper operation, maintenance and testing of the generation system and in the training of building personnel.

CONCLUSION

The issues presented are complex and make clear the important role of the engineer in planning and recovery related to disasters. This article is of a general nature and not intended to be comprehensive or provide legal advice. For specific legal advice, please consult a lawyer.

ABOUT THE AUTHOR

Peter Funk is a partner in the law firm of Funk & Zeifer LLP. His renewable, alternative and conservation energy practice includes cogeneration, solar power, landfill gas or animal waste bio-methane to power\gas off-take, cogeneration, energy efficiency, conservation projects, demand site management and energy-related financings. He has been involved with many on-site CHP and solar generation projects. Among many other representations throughout the energy industry, he has served as outside general counsel to an energy services company.

A member of the American and New York State bar associations and the Association of the Bar of the City of New York, he is a graduate of Boston University School of Law. He often writes and speaks on topics in the energy and sustainability sectors. He is a member of the Energy Committee of the NYC Bar and an Associate Member of AEE, and a member of the Technical Advisory Board of Mission Critical Magazine.

He was president of the multi-family cooperative apartment building that became the first real time price electricity customer of Con Ed as a NYSERDA demonstration project. That project also included participation in an emergency electric curtailment program with NYISO and an energy efficiency retrofit of the building. He has received a "Green Team" award from the New York Association of Realty Managers.

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