



CASE STUDY

Overlook Medical Center

Resiliency Masterplan & CHP Project for Atlantic Health System

Atlantic Health System's Overlook Medical Center is a 1,000,000 square foot hospital with 500 patient beds. Concord Engineering Group's scope included an energy master plan for the facility which led to \$15M in construction cost and \$1.4M in state grant funding.

The goal of the Overlook Resiliency Assessment was to help Atlantic Health understand and qualify what level of resiliency is required to meet the hospital needs during normal and unforeseen conditions. Critical Facilities were defined by the essential nature of their service delivery – not necessarily just emergency services or ambulatory care – but facilities that absent their services the hospital would cease to function, or the patient and staff's well-being would be diminished. The assessment defined the desired level of resiliency, described specific resiliency vulnerabilities and offered solutions to provide resilient energy supply

THE CONCORD DIFFERENCE

- Concord Energy Services, a division of Concord Engineering Group, works exclusively on behalf of our clients as a trusted energy advisor. As a full-service energy asset management firm, we specialize in providing innovative solutions to healthcare infrastructure clients and mission critical projects across the country.

THE CHALLENGE

- Identifying critical and potential vulnerabilities through a review of the hospital's energy systems
- Defining the desired level of resiliency, described specific resiliency vulnerabilities, and offered solutions to provide resilient energy supply
- Developing an 8,760-hour energy model to project electrical, thermal, and fuel consumption values to define the facility's load for a full year
- Comparing installed system capacity versus building usage as well as input to a financial proforma to project revenues from a new Combined Heat and Power (CHP) project

+ LOCATION

Summit, NJ

+ DURATION

2020 - Present

+ SERVICES

Energy Advisory
Commodity Consulting
Microgrid & Distributed
Generation Engineering

+ TAGS

Community Energy
Aggregation (CEA)
Renewable Electricity & Gas
Procurement
Reverse Auction Platform
Combined Heat & Power
(CHP)

GET IN TOUCH

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PROJECT OVERVIEW

SYSTEMS EVALUATED INCLUDE:

- Electrical Distribution
- Essential Energy System Diesel Generators
- Existing CHP System Generators
- Steam System
- Diesel Fuel Storage
- (4) Independent Chilled Water Systems
- Large Air Handlers Units

HIGH LEVEL FINDINGS:

- The normal electrical distribution system had several single points of failure and outdated equipment past its useful life.
- Emergency Generator System had ample capacity and optional loads could be added to the Essential Energy System to expand services provided power during a utility outage.
- The cost of upgrading the existing CHP system as is will not provide enough energy savings to justify. It was recommended to install a 2.5 MW reciprocating engine generator CHP system as a replacement.
- Natural gas power generation is required to maintain space temperatures during a prolonged outage in the cooling season.
- Fuel oil storage system had ample capacity and did not require upgrades
- (4) decentralized chiller systems did not have N+1 capacity. Several chillers passed their service life are identified. Recommendations were on replacements are ranked based on level of risk of failure.
- Several large air handling units were recommended to be replaced or retrofitted to meet 100% outside air and installed in tandem to supply redundant capacity.

CONCORD ENGINEERING SOLUTION:

- Concord provided engineering services to replace the aging CHP System with a new state of the art microgrid system including a new 2.5 MW reciprocating engine generator and heat recovery steam generator and absorption chilling system. The project has been completed and is successful.
- Concord provided engineering services to replace aging electrical distribution system. This work is currently in final commissioning.
- The hospital team was able to use information from the master plan to make decisions for expanding the facility to replace chilled water equipment and expand the emergency power system.

LESSONS LEARNED:

- Hospital emergency power systems may have adequate generation and fuel storage capacity; however, downstream power distribution infrastructure can be the limiting factor to providing emergency power during a loss of power event.
- Typically, hospital chilled water systems are not powered by the emergency power system as it is not required by NFPA 99; however, hospitals likely will have to evacuate during a prolonged utility outage during high temperature months if space temperatures cannot be maintained. A natural gas powered microgrid on the normal energy bus can provide power to these systems during normal conditions to save energy costs and can provide critical power to non-emergency power equipment to keep systems in operation.

ABOUT OUR DISTRIBUTED GENERATION & MICROGRID DESIGN EXPERTISE

Concord Engineering Group is an industry leader in designing distributed generation systems and micro-grids that are functional and meet the unique needs of project owners, utilities and sponsoring agencies. We begin by understanding the end goals of an application and inform our designs with our capability to model energy load and use profiles. We seek to provide practical designs and solutions that can be built and provide flexible and resilient operation.

Our experience with energy and “micro-grid or resiliency as a service” business models is unique among engineering and integration consultants and informs our designs and working relationships with clients. If it doesn’t pencil, doesn’t work or can’t be built – there is not a project.

Functional and effective distributed generation / micro-grid projects often require sophisticated load and demand management platforms. Our experience with state of the industry micro-grid controllers and experience with SCADA and controls integration provides our clients with proven and practical solutions that can be constructed and will be functional.