

1.0 EXECUTIVE SUMMARY

The FDA Building One located in White Oak, MD was renovated in 2007-2008 as a part of a larger effort to consolidate FDA facilities at the Federal Research Center. The historic Naval Ordnance Building was built in 1946 and is located on the FDA's new headquarters campus outside of Washington DC. This four-story, 102,000-square-foot building was completely transformed into the Office of the Commissioner for FDA and serves as the gateway to the FDA campus. The building's historical integrity was maintained through the renovation.

The mechanical system that was designed for this building uses a variety of systems to service the different areas based on the use of the space. FDA Building One receives conditioned supply air from three air handling units (AHU's). These serve the building's perimeter offices, security pavilion, conference rooms and interior work spaces. Additional computer room AC units are used for LAN and electrical rooms.

Building One is connected to a Central Utility Plant (CUP) on the campus. The plant has a CoGen unit that provides electricity as well as chilled and hot water to buildings on the campus. The Central Utility Plant was developed in partnership with Semptra Energy Services and Honeywell under an Energy Savings Performance Contract. The efficiency and reliability of buildings running serviced by the plant justify the cost for the build out.

In an effort to reduce the load on the Central Utility Plant, an improvement opportunity was considered for Building One. A photovoltaic system that would provide up to 40% of the building's electric needs was evaluated. Cost and payback of the system were justified by taking into consideration the fuel tariff rates used for electricity generation at the CUP.

To minimize losses and smooth spikes from electricity generated from the photovoltaic system, a direct current approach was studied. As a part of the construction management breadth, constructability of embedding thin film battery into wall insulation was examined. The robust material is a cutting edge technology that conglomerates are investing in heavily. Scheduling concerns are addressed by the fact that the thin film battery comes in rolls and can be cut to suitable size in the field.

As part of the electrical breadth, DC distribution applications within the building were proposed. DC distribution would eliminate the need of an inverter and, thus inefficiencies, of converting from DC to AC from the photovoltaic system or battery backup. The flexibility and sustainability of the approach is very well developed, as are the options available for system fixtures.

The impact of DC applications in the building was tied back to the mechanical system. Exploitation of the efficiency of the system allowed for resizing the pumps that are used within Building One. If applied, upfront cost savings of up to 10% could be realized.