



Network Operations Center

Foundation for Cutting-Edge Strategic Energy Management Initiatives

On May 7, 2012 the Philadelphia Industrial Development Corporation (PIDC) and Viridity Energy officially opened The Navy Yard's Network Operations Center (NOC), an on-site operations, research, education and training platform that serves as The Navy Yard's first important step in establishing a "smart grid" electric distribution control and monitoring network. The NOC will become one of the foundational "building blocks" to demonstrate energy efficient management of The Navy Yard by monitoring its electricity consumption and demand portfolio. The project and underlying technologies were developed by Viridity Energy, a smart grid technology company headquartered in Philadelphia, PA. The educational curriculum was developed jointly by the Pennsylvania State University, Drexel University and the University of Pennsylvania.

The NOC will create a research, education and training platform based on load management technology and associated Demand Response markets operated by PJM that is expected to improve both commercial software algorithms and load pricing mechanisms as well as contribute to overall building energy efficiency. The NOC will also support the integration of additional distributed resources at The Navy Yard as they become developed, such as solar electric vehicle charging stations and grid scale storage. In addition to serving as The Navy Yard NOC, Viridity Energy will establish this Navy Yard facility as its fully functional back-up to Viridity Energy's Center City-based Network Operations Center.



Audrey Zibelman of Viridity Energy and John Grady of PIDC, with others, cut the ribbon for the NOC

The Opportunity Research Fund

The project is one of the first completed with funding provided by the EEB Hub's Opportunity Research Fund. This fund provides grants to support research, development, demonstration and deployment of technologies, policies, business models and training programs that advance EEB Hub goals. Through a competitive process, the EEB Hub awarded seven projects a total of \$1.3 million last year, with each project receiving between \$100,000 and \$250,000. The NOC received \$160,000 to provide secure and advanced energy management services for the independent grid at The Navy Yard.

Educational Opportunities

Through this program, The Navy Yard NOC is providing unique educational and workforce development opportunities through a partnership with Penn State University, University of Pennsylvania and Drexel- all EEB Hub members. These academic institutions are working together with PIDC and Viridity Energy to collectively offer courses around the NOC to expand the number of trained professionals capable of dispatching load as a resource into the electric grid. This type of training and experience is most typically only available after being hired. By providing training to students before they graduate, the Hub is creating a skilled workforce that is ready to hit the ground running and potential employers save time and money training new employees in

essential skills for advanced building energy management. Several days of classes were provided to 21 students beginning on May 7. By training the workforce of the future in advanced building energy efficiency technology and practices, Pennsylvania students are being prepared to fill the growing needs in the energy efficient building sector.

For two days, Viridity transformed The Navy Yard Network Operations Center into a classroom where students from Penn State and Drexel played the role of energy consultants to manage a building's energy strategy, keeping in mind the operational and budgetary constraints indicated by the energy manager. The strategy covered all available energy markets: capacity, energy, ancillary (synch and regulation) and tested the students' understanding of both the customer's mechanical capabilities and business needs.

Overall, the students excelled at developing and presenting the strategies they crafted to a number of Viridity employees. Two teams, "The Cleantech Innovators" and "The Virtual Generators" tied for the strategy that had the highest return on investment. In a post lab survey, all responding students said that the lab provided an effective way to apply their in-class learning and recommended having it as a component of the class next year.

Next steps

PIDC and Viridity will also continue to develop the capacity of the NOC, in collaboration with its educational partners, to eventually provide energy usage data and tools to provide customers at The Navy Yard significant capabilities to manage their customer electrical loads. Additionally, PIDC will collaborate closely with several EEB Hub demonstration projects and University training curriculums, inclusive of the GridSTAR and Mid Atlantic Clean Energy Application Center.