



Savings are primarily reflected in how we manage the cost of facility operations and the cost of energy. We must track key data on our buildings' usage of energy to make this happen. Our prior investments in improved efficiencies are even more important today than at the time of commissioning.

-Jerome Fennell,
Director of NHC
Property Management



Cape Fear Museum of History & Science

Challenge: Artifact Preservation for the New Hanover County Cape Fear Museum of History and Science

The New Hanover County Cape Fear Museum is the oldest history Museum in North Carolina, originally created by the United Daughters of the Confederacy as a "credible museum of Confederate relics." The Museum began as The Confederate Museum in 1898, in one room, staffed entirely by volunteers. Today, it has grown into a professionally run, American Association of Museums accredited institution, housing more than 50,000 objects and offers a variety of exhibits on the history, science and cultures of the lower Cape Fear region.



In 2003, the County became concerned about the potential for degradation of the many items in the Museum, due to fluctuations in temperature and humidity caused by its seaside location. In addition, the Museum was unable to attract borrowed exhibits unless it could provide a 24-month record demonstrating a well-controlled environment. These conditions led to a decision to significantly upgrade the temperature and humidity control systems for the facility.

The Project Goals

- Improve the Building Automation System interface, and the control and monitoring of the exhibit area temperature and humidity
- Replace the existing pneumatic HVAC system with up-to-date equipment
- Improve lighting levels and efficiencies
- Provide client with easily achievable, user-friendly, remote web access to the whole system
- Reduce energy costs while maintaining the comfort and quality of the environment

The Team

Under the direction of Jerome Fennell, Director of the New Hanover County Property Management Department, staff supervisor Thomas Melton and his team developed a capital improvement specification for the project. Working closely with their Systems Integrator, Raleigh-based Energy Automation Technologies, and Activelogix, the regional VYKON Distributor, a system configuration and implementation schedule was established to accomplish these objectives.

The Results

The new configuration substantially improved the museum's ability to control the critical environment for the priceless exhibits on display and in storage. In addition, the Museum has since been able to attract a number of new international exhibits that would have not considered this venue before 2003. With new tighter controls and improved alarms and scheduling capabilities provided by the new system, energy consumption efficiency was dramatically improved, commensurate with a reduction in operating costs for the County.

- Building Interface: Niagara Framework® - VYKON R-2
- Controllers: American Auto-Matrix (20) with Trane LON interface
- Building Systems Controlled: Trane chiller and low pressure boiler
- System Functions Controlled: Chilled water, hot water, and steam (humidity)
- Additional Zone Controls for: Space heating, cooling and humidification

About New Hanover County

Situated on the "Southern Coast" of North Carolina, New Hanover County is one of 100 counties in the state. Located in the Wilmington metro area on the Cape Fear River, the county is home to over 180,000 people. New Hanover ranks in the top 25 North Carolina counties for growth, and has a history replete with explorers, pirates, American Revolutionary heroes, Civil War battles, blockade runners and early railroads.

During the past five years, New Hanover County has embarked on an impressive series of modernization projects, some involving historic preservation and others bringing state-of-the-art controls to a variety of structures, each with their unique challenges.

About the New Hanover County Property Management Organization

Led by Jerome Fennell, this 68 person organization is responsible for planning, managing, and maintaining the approximately 40 facilities totaling 1,231,000 square feet for the New Hanover County government. In addition to managing the County's energy resources, the department performs general and preventive maintenance, custodial services and some new construction and renovation.

About Energy Automation Technologies, Inc.

Energy Automation Technologies, Inc. designs, installs and services a wide range of building automation and environmental controls. We work closely with our clients to integrate multiple platforms and provide energy profiling to achieve a total building solution. For additional information see www.energyautomationtech.com.

About Activelogix, LLC

Activelogix, LLC is a leading provider of Internet-based enterprise automation solutions, including design services, consulting, custom applications and technologies to enable management and optimization of sustainable, energy-efficient, and secure facilities in a multi-vendor, cross platform environment. For additional information see www.activelogix.com.

Based on the overwhelming success of the Museum project, the County embarked on a Continuous Improvement Program for sustainability and energy efficiency for other County buildings. Over the course of the next five years, the County commissioned 15 additional renovation projects resulting in substantial improvements in performance and efficiency throughout the County. These projects included the following facilities:

- Northeast Regional Library
- NHC Main Library
- Judicial Building
- NHC Jail
- Public Safety Communications Center
- NHC Senior Center
- Government Center
- Old Courthouse
- Juvenile Day Treatment Center
- NHC Health Dept.
- Office of Juvenile Justice
- Department of Social Services
- Myrtle Grove Library
- NHC Property Management Operations

Throughout these projects, extensive use was made of the latest in controls technology. Most of the facilities now employ the VYKON JACE controller/server platform, T8 lighting retrofits, wireless data technology to extend the control network to adjacent structures, and light sensors for automatic control of dimming when enough natural light is present. The County has deployed the VYKON Energy Suite (VES) and is currently developing training on energy awareness programs for the entire County, using VES's ability to aggregate and analyze real-time and historical energy consumption data.

The County is now focused on attaining LEED® certification for many of its buildings. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.



The county's first target is the recently renovated courthouse. This historic structure was built in 1896, and posed a number of challenges for modernization without impacting the historical design.

To date, the electrical and mechanical systems have been updated with the addition of a Tridium interface, overlying multi-protocol control systems featuring BACnet, LON, Modbus and Pup control devices, motion sensors, humidity controls, energy monitoring, load-shed logic, and more. As a result, the energy efficiency of the courthouse was improved by 24%, resulting in a savings to the County of nearly \$26,000 per year in avoided utility costs for the 23,400 square foot structure.

Today the county courthouse is only 11 points away from being LEED certified. This is a remarkable achievement for such an old structure, and a credit to the Property Management team at New Hanover County.

In discussing the success of the county-wide renovation projects, Jerome Fennell commented, "I'm excited about energy savings we have achieved to date, particularly in this recent financial downturn. Our prior investments in improved efficiencies are even more important today than at the time of commissioning. Looking forward, our ability to adjust set-points and more thoroughly initiate and manage equipment scheduling according to actual needs will have an accelerating, positive impact on lowering operating costs across all County facilities, while maintaining or improving performance, security, and comfort."

In summary, New Hanover County is a classic example of how a small but dedicated "energy-wise" organization can leverage industry leading building automation "best practices" to achieve significant economic savings on a wide scale, while continuously improving sustainability, reliability and performance, year over year.



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