

CASE STUDY

BUILDING AUTOMATION CONTRACTORS

Saint Vincent's Staten Island Hospital

Improves Building Efficiency and Patient Comfort

In health care, comfort and convenience are carried to extremes. To complement its professional services in caring for the infirm, Saint Vincent's Staten Island hospital instituted an upgrade to its aging building cooling system, to a modern configuration of increased reliability, and comfort.

Growing Pains

In the days of its infancy, maintaining a 74-bed facility, the hospital provided services across the continuum of care to people of all ages throughout the New York metropolitan area. Through years

of expansions it has steadily grown to one of the areas most comprehensive healthcare providers, and to its current bed complement of 440. In 2001, inadequate output from several absorption chillers used to supply chilled water to the complex's three buildings prompted a system-wide audit of the cooling infra-

structure. The review uncovered plausible threats to the hospital's mission to treat within a comfortable physical environment. Not surprising, the compromising factor contributing to the system's inefficiency lied within its antiquated design. It consisted of independent chilled-water systems, each with its own cooling towers, pumps, and controls feeding separate distribution systems to the three outlying campus buildings. Even under low-load conditions, all the systems had to continue operating—an extremely inefficient process. Furthermore, all systems were

Project Team

Owner & Developer: Saint Vincent Catholic Medical Centers, NYC

Prime Contractor: Con Edison Solutions, Westchester, NY

Design Engineer: Atkinson Koven Feinberg Engineers, LLP, NYC

Mechanical Contractor: JDP Mechanical, Inc., NYC



structure. Should one system fail, there was no way to provide backup through another system.

The Operation

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Key Benefits

Challenges:

- Develop a pleasurable, and caring quality environment to complement the hospital's services in healing the human body, mind and spirit.
- Enhance operational efficiency, flexibility, and redundancy to reduce operating time of chillers.
- Conserve energy while maintaining patient, staff and visitor comfort at all times.

Solutions:

- Upgrade to a computerized system that allows engineers to operate the facility from a central location.
- Consolidate facility management operations by installing a LonWorks based Facility Management System.
- Implement energy conservation measures by improving chillers, variable speed pumps, and cooling towers.

Vincent charged Con Edison Solutions, of Westchester, with the task of spearheading the design and installation of a high-efficiency central chilled water plant.

To execute these changes, Con Edison retained the services of AKF Engineers, LLP, of New York City, experienced in the area of mechanical and electrical systems design, and JDP Mechanical, LLC, of Astoria, qualified in the area of mechanical systems installations. Two York 600-ton natural gas engine-driven chillers were added to the existing Trane 600-ton steam absorption chiller, providing up to 4320 gallons per minute of chilled water to the facility's air handling equipment. Eleven constant-volume pumps were replaced with three 100-horsepower chilled water pumps and three 50-horsepower condenser water pumps along with their Danfoss variable-frequency drives to meet any flow requirements.

The Recovery

To complement the newly installed components, Con Edison turned with confidence to T.E.C. Systems Inc. to provide a cost-effective method for facilitating the harmonious control of the mechanical systems. To synchronize all the different mechanical systems, the company designed and installed an integrated open protocol system utilizing LonWorks technology, developed by Echelon Corporation. T.E.C. has been an Echelon Authorized Network Integrator since 1995 with dozens of LonWorks based installations to its credit.

Results:

- Achieved greater energy efficiency from the mechanical system upgrades and LonWorks Facility Management System.

- Increased energy tracking capabilities and system monitoring functions while maintaining system uptime.
- Increased equipment reliability, flexibility and cost effectiveness.

The LonWorks network includes over 100 total connections to system components including the York chillers, Danfoss variable frequency drives, Echelon LonPoint Modules, Neurologic temperature and humidity sensors. All networked devices came factory furnished with LonWorks FT-10 free topology transceivers. This polarity insensitive 78kb network facilitates communication between all connected devices and the Graphical User Interface (GUI). T.E.C. Systems was able to reuse some existing twisted pair cabling, with minimal new cabling required. Because a LonWorks network provides peer-to-peer communication between devices, the need for homerun cabling was eliminated, substantially reducing wiring and labor costs. Prior to the installation of the LonWorks system, facility personnel had to physically go to each component to monitor and manage it. Today, detailed information on the status of each component is displayed on a workstation equip with a LonWorks Network Services (LNS) based Honeywell SymmetrE Graphical User Interface and Echelon LonMaker management software. Maintenance staff can view alarms, display trends, and make set-point adjustments without leaving their office.

These mechanical, electrical, and plumbing upgrades, coupled with a system-wide emphasis on technology and quality will certainly complement St. Vincent's mission to treat with respect, integrity compassion, and excellence. As the hospital approaches its centennial commemoration, such investments in its facilities will serve it well into the future.

T.E.C. Systems Incorporated

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