



Flexibility for N.Y. Medical Center

By Nancy L. Robbers

New York University Medical Center (NYUMC) consists of the New York University School of Medicine and two hospitals: Tisch Hospital and Rusk Institute of Rehabilitation Medicine. More than 150 years old, the school includes facilities for biomolecular medicine, biomedical sciences, and an AIDS research center. The hospitals offer treatment and diagnostic services as well as centers for reconstructive and plastic surgery, skin and cancer units, and research and training programs that center around spinal cord injuries, Alzheimer's disease, stroke rehabilitation, and more.

In late 2003, the medical center embarked on two major projects: construction of the Smilow Research Center, a new 160,000 ft² (14 900 m²) laboratory facility, and the retrofit of an antiquated building controls system for the 13 existing buildings that make up the 3 million ft² (279 000 m²) main campus. Both

projects had to be completed without interruption to 24/7/365 hospital and school operations.

NYUMC wanted a long-term relationship with its building controls system supplier. Its biggest challenge was to find a service provider that could help forecast future environmental needs

of the medical center's campus and install a flexible system that could incorporate the changes that come with growth. Reducing overall expenses was important, but NYUMC required a vendor who not only had the technological capabilities to achieve its goals, but also the project management skills and customer service to do so.

NYUMC decided it made sense to have one vendor for operating and maintenance costs. After interviews with multiple vendors, it chose a BACnet[®]-based system to update the archaic building controls system for the campus and to outfit the new laboratory in the Smilow Research Center.

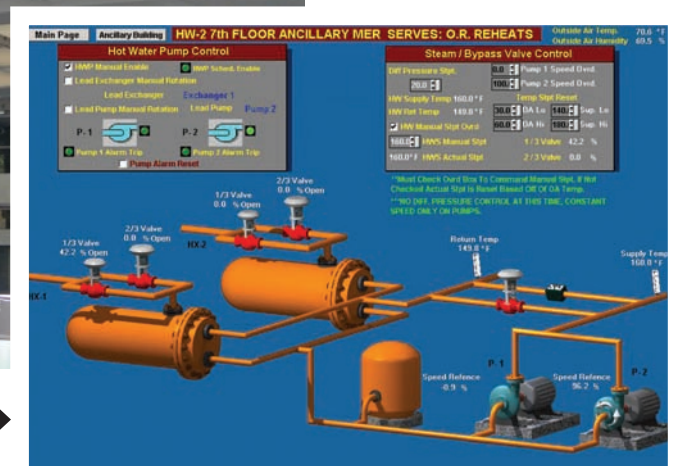
The geography of NYUMC posed a challenge for the campus retrofit project. During its 150-year history, the NYUMC campus grew through construction of various buildings, interconnected through a basement and tunnel system. Many

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◀ *BACnet was used to update New York University Medical Center's archaic building controls. A BACnet system also monitors its new BSL-3 laboratory.*



A display of domestic hot water tanks. The BACnet system enables the nurses station to maintain ideal conditions for operating suites. ▶

times, new buildings were constructed adjacent to existing buildings. Depending on each addition's purpose, different height requirements exist from one building to the next. As a result, floors interconnect at different levels: going from the fifth floor of one building may put a visitor on the fourth floor of the adjacent one. It was a complex task to determine where mechanical rooms were located in the labyrinthine facility and subsequently get network connectivity up and running.

The multiuse nature of the medical center required many different types of HVAC zones. The NYUMC features patient rooms, operating suites, waiting areas, tuberculosis rooms and laboratories. Each area requires accurate environments, including differential pressure settings to thwart transmission of airborne contaminants.

The medical center retrofitted the entire main campus with a building automation system (BAS) based on the BACnet open protocol. The new NYUMC building automation system included redundant servers, a new fiber optic network infrastructure, integration of seven chilled water plants, and replacement of 240 legacy direct digital controls (DDC) control panels. Thirteen operator workstations and seven touch screen graphic displays allow the staff to manage the campus and outlying facilities through a single, native BACnet system.

The campus upgrade project began with a comprehensive

survey of everything connected to the 240 existing control panels. The existing DDC and pneumatic panels were a mix of several proprietary manufacturers. Based on the survey, technicians fabricated customized DDC panels based on modular BACnet DDC hardware, then wrote custom software to meet the specifications and match the field conditions. The building controls system supplier worked with the third-party manufacturers to integrate their disparate systems in the new BACnet system using protocol converters.

During the changeover, the medical center used the manual override switches to position the dampers and valves to maintain comfort. The legacy DDC controllers were then turned off, removed, and replaced with new DDC controllers. Once the local control system was started up and tested, it was connected to the campus network. With 240 panels to replace, the technicians got the swap-outs down to a science and quickly completed them.

In operating suites, where temperature, humidity and pressure differentials in each zone are critical, NYUMC installed new monitors in each operating room to trend and track these conditions. A Web-based workstation enables operating room nurses to review the space conditions at their central stations using a Web browser, and to schedule procedures and place maintenance requests as necessary. NYUMC includes two



Advertisement formerly in this space.

Trend logs show medical center staff the conditions of the facility over a long time period. Here, trend logs illustrate how closely actual room temperature matches the setpoint. This enables staff to closely control the environment for patient comfort, health and safety.

biosafety level 3 (BSL-3) laboratories. Biosafety levels are classified by each redundant layer of safety protection they provide. A BSL-3 lab provides three levels of safety measures for working with indigenous or exotic agents that may cause serious or lethal disease as a result of inhalation. Installation technicians underwent specialized training and wore protective clothing, masks and gloves to do the controls work inside NYUMC's BSL-3 laboratory.

To address the future building automation needs of its facilities, NYUMC developed and implemented a 10-year strategic partnership agreement with its HVAC vendor. The agreement includes new construction, service, maintenance and system upgrades to accommodate subsequent changes and growth.

New York University Medical Center now is home to a completely updated, campus-wide building automation system and precisely controlled operating rooms, patient rooms, administrative space, and BSL-3 laboratories. The new system proactively trends thousands of data points

and archives the data. This historical information enables the management team to reconstruct the conditions before and after an alarm event to assist in determining the cause of the alarm and its effect on hospital operations. Various third-party proprietary equipment—fire alarm, emergency generators, chillers, and others—has been seamlessly integrated into the open protocol system and enables the medical center to add to and adjust its system without being tied to a single manufacturer. Both the retrofit and new installation were completed without disruption to NYUMC's daily operations. The partnership agreement means the medical center has long-term guidance in achieving its goals to keep the facility safe and comfortable for its patients, visitors and staff.

“Outstanding technology wasn't the only issue in choosing a vendor. We chose our supplier for the ability to meet project management requirements, and BACnet products for our developing future needs,” said Richard Cohen, vice president of facilities at NYUMC. ●