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*Bob Biggio  
Vice President of Facilities Planning  
Massachusetts Eye & Ear Infirmary*

#### PROJECT AT A GLANCE

Project Type: HVAC (BACnet)

Location:

Boston, Massachusetts, USA

Number of Buildings: 3

Total Area: 460,000 sq. ft. or 43,000 m<sup>2</sup>

Applications:

- Temperature and humidity control
- Medical gas monitoring
- Chiller plant control
- HW system control
- Air Quality control
- Surgical level OR temperature, humidity, air quality, pressure
- HVAC systems scheduling and overrides as emergency operating situations arise
- Emergency shutdown for entire or partial systems in the event of hazard situations including a terrorist threat
- Heating oil level monitoring
- PH discharge level monitoring
- Data center critical alarm monitoring including temperature, humidity, utility power, generator power, AC unit failure, water, fire

Total System Points: 1,550

Andover Continuum Equipment Installed:

3 – Network Controllers

147 – BACnet Controllers

2 – BACnet Operator Workstations (B-OWS) PC Workstation with web.Client™ installed

SQL server

web.Client server

Network:

Ethernet LAN running TCP/IP and BACnet/IP

TAC Partner:

BASiX Automation Integrators, a Division of Engineered Systems Inc.

## TAC® Provides BACnet™ Solution for Massachusetts Eye & Ear Infirmary

### Web-based Open System Provides Flexibility and Options for the Future

Massachusetts Eye and Ear Infirmary (MEEI) in Boston, Massachusetts, is a specialty hospital providing patient care for disorders of the eye, ear, nose, throat, head, and neck. Founded in 1824, MEEI is an international leader in Ophthalmology and Otolaryngology research and a teaching partner of Harvard Medical School.

#### HOSPITAL SOUGHT AN “OPEN PROTOCOL” SOLUTION

Because MEEI operates 24/7/365, they require a building control system that will deliver uninterrupted performance. The hospital also needs responsive, immediate service when there is a problem with an HVAC system. Their existing 20-year-old proprietary control system provided neither, and with facility expansion on the horizon, MEEI turned to local TAC Partner, BASiX Automation Integrators, of Hampton, New Hampshire, to replace it with an “open protocol” system — an Andover Continuum BACnet facility management system. Under the expertise of BASiX Field Superintendent, Mike Hoyt, BASiX provided a complete retrofit solution.

“Open protocol systems are especially critical in the healthcare market, where legacy systems, mission-critical operation, cost controls, and technology advances are givens,” notes Joe Conley, Project Manager for BASiX. “There’s always a new wing or building being added. The Continuum BACnet solution addresses MEEI’s needs for flexibility, seamless connectivity, and future expansion.”

#### Why BACnet?

“I wanted a facility management system that was open-ended to ‘talk’ to multiple vendors,” says Bob Biggio, MEEI’s Vice President of Facilities Planning. “We chose BACnet because an open protocol system allows us to integrate our existing equipment from Trane, Carrier, York, Liebert, etc., and whatever we add in the future. Plus, now we get monitoring, alarming, and trending capabilities through one unified control system, using a single graphical user interface.”



The Smart Sensor provides facilities staff a convenient way to adjust room temperatures.

### CONTINUUM PROVIDES COMPREHENSIVE FACILITY MANAGEMENT

The MEEI main campus encompasses three buildings. An Andover Continuum™ BACnet system was installed in the Main Tower, a 17-story building that houses the operating, inpatient, and outpatient examination rooms, medical staff offices, and cafeteria; in an 8-story connector building that includes research areas and labs; and in an 8-story data center/administration building.

The Continuum system controls and monitors the hospital's main chiller plant, hot water system, air handling units, and VAV terminal boxes, plus specialized health-care applications such as operating rooms and isolation rooms. In addition, Continuum monitors the hospital's medical gases, steam pressure, and building pressure. Because the hospital's labs must abide by Massachusetts Water Resource Authority (MWRA) regulations concerning water discharge limits, MEEI also uses Continuum to monitor the alkalinity of the water being discharged from their waste treatment plant. In MEEI's data center, Continuum monitors critical alarms, including emergency generator oil tank levels, water pumps, air conditioning unit failures, fire alarms, and the emergency power generator status.

### ENTIRE SYSTEM IS NATIVE BACNET

The TAC system at MEEI uses Continuum's native BACnet controllers. Designed in strict accordance with ANSI/ASHRAE standard 135-2004, Continuum's BACnet controllers do not need special protocol converters, or "gateways," in order to interoperate with either BACnet or non-BACnet devices on the network. Included in the BACnet system at MEEI are three b4920 controllers. The b4920 is a powerful system controller that performs all the functions of a BACnet/IP-to-BACnet MS/TP router, routing messages from the Ethernet network to the field controllers. The three b4920 controllers also feature built-in I/O with expandability if additional points are required. The MEEI Continuum BACnet system, which also includes b3920s, b3850s, b3814s, b3866s, b33867s, b3624s, b3885s, and one b3608 controller, operate on an MS/TP field bus network. In addition, centrally located wired network drops, located on every floor in the Main Tower, allow MEEI's facilities technicians to plug in a laptop computer and troubleshoot the HVAC equipment, as necessary.

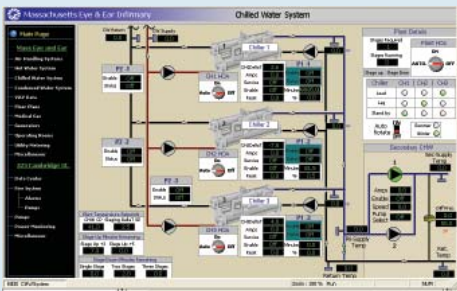
### B-OWS PROVIDES SINGLE-SEAT CONTROL OF ENTIRE FACILITY

MEEI's entire facility management system, including all third-party equipment, is under the control of the Continuum's native BACnet Operator Workstation (B-OWS), the CyberStation™.

"CyberStation makes my job a lot easier now," says Michael Canning, MEEI's Director of Facilities. "It consolidates all of our systems under one graphical front-end — providing us full alarming and control of all BACnet-compatible devices on our network." Canning's HVAC technicians also use Continuum's web-based front-end software, web.Client™, to view alarms remotely over the Internet, even from their homes. TAC Partner BASiX can also use web.Client, when necessary, to troubleshoot a piece of equipment from their Hampton, New Hampshire office.

### SMART SENSORS ALLOW STAFF TO MAKE O.R. TEMPERATURE ADJUSTMENTS

More than 21,000 surgeries are performed every year at MEEI. Proper environmental control in their operating rooms is critical for physicians and patients alike. Operating room temperatures are usually set cooler for adult patients and warmer for children. Mounted on the wall in each O.R. is an Andover Smart Sensor, an intuitive, six-button sensor with LCD display. The Smart Sensor allows the medical staff to adjust the room's temperature and can be used to override the hospital's night setback mode in preparation for an emergency after-hours surgery.



CyberStation Chilled Water graphic



CyberStation Home Page with aerial view of MEEI's campus

### EMERGENCY SHUTDOWN WITH THE PUSH OF A BUTTON!

The Continuum system plays a key role in MEEI's "Emergency Shutdown" procedure. This plan was recently put in place in preparation for a potential terrorist attack during the Democratic National Convention, which was held in Boston in July 2004. In the event of a bio-terrorist incident, the CyberStation operator would press the "Emergency Shutdown" graphic toggle on the screen, and the Continuum system would immediately signal a critical alarm, page all maintenance personnel, and shut down the hospital's air handling systems, closing outside air dampers and opening hot water valves (freeze protection) to avoid spreading a virus or germ attack.

"In the event of a bio-terrorism attack, I can shut down the whole facility with the push of the button if I had to," says Canning. "Thankfully, we haven't had to do this!"

According to Bob Biggio, future hospital plans include over \$40 million in new construction in the next 5-6 years. No doubt, the BACnet system at MEEI will continue to grow with the facility.

### MEEI CARD ACCESS SYSTEM

In early 2005, BASiX was also contracted to replace the MEEI's existing card access and security system. The initial project includes two Continuum CyberStations, a 32-node NetController, and sixteen proximity readers. The equipment will be installed in the 325 Cambridge Street research facility. BASiX

account representatives, Ralph Beaudry and Julie VanAken, played key roles in making this project happen.

MEEI was looking for an integrated solution for HVAC, access control, and CCTV. The hospital will eventually replace their existing digital video recorder with an Integral Technologies solution and expand to a 64-camera system.

"One of the security department's challenges at MEEI is its diverse list of responsibilities," adds Beaudry. "The future plan is to include web access, so that security personnel on the move will be able to have immediate access to the TAC access/security system."



The Smart Sensor provides medical staff a convenient way to adjust room temperatures.



MEEI's HVAC Technicians standing next to a Continuum BACnet control panel



MEEI's Bob Biggio and Mike Canning use web.Client from a remote location to check the status of HVAC equipment in the main hospital facility.

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PP-HCARE-MEEI-US  
12/05



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