

Case Study: Emerson Hospital

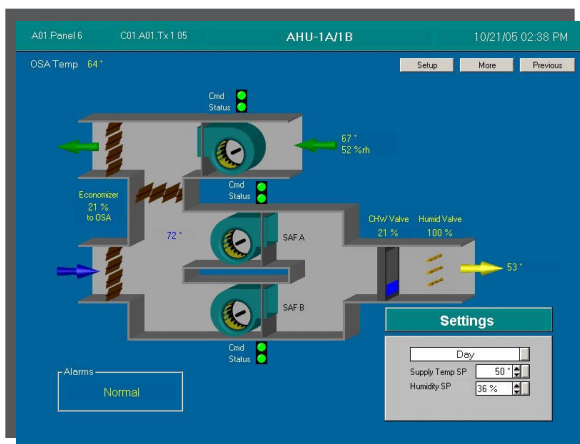
ALERTON®

In contrast to its location in one of the oldest cities in the United States, Emerson Hospital—part of the Partners Healthcare Organization—provides highly advanced medical services. More than 220,000 people in 25 towns surrounding Concord, Massachusetts enjoy Emerson's long-standing healthcare expertise. Experts from both Emerson and Massachusetts General Hospital, in Boston, staff its highly sophisticated and renowned radiation-oncology program.

When Emerson began renovating its operating and patient rooms, it required a heating, ventilating and air conditioning (HVAC) system that consolidated all the building controls, saved energy and costs, and kept patients comfortable. Alerton's Massachusetts dealer, Energy Management of New England (EMNE), had provided temperature controls inside Emerson for years and was the hospital's preferred choice for a major building controls retrofit.



Different environments within Emerson Hospital, such as the Cancer Center above, are easily monitored, controlled and managed—despite each area's very specific HVAC needs.



An air handling unit: Envision for IBEX's customizable displays show you everything from the entire system to a single device.

Emerson Hospital's greatest need was centralized control of all the building's systems.

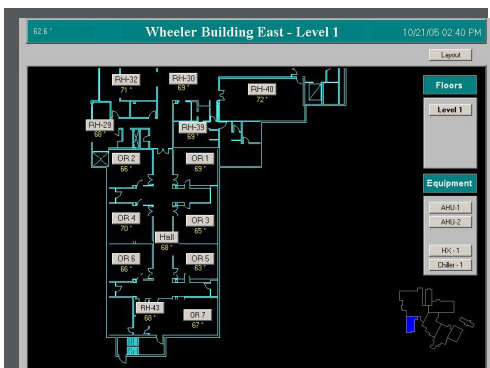
One main difficulty in updating the hospital's existing HVAC systems was that some of the equipment was built more than 50 years ago. Numerous additions to the building were designed according to then-in-trend criteria. This resulted in a cluster of various systems types, making it a particular challenge to ensure interoperability between the new and old systems.

Each section of the hospital—including operating suites, emergency rooms, patient rooms, radiation-

oncology and infectious areas—requires a different environment. For example, temperature and humidity in recovery rooms are closely regulated to keep patients comfortable. Pressurization differentials between infectious areas and the rest of the hospital must be maintained to isolate airborne microbes. In response, the upgraded building controls system had to include the ability to monitor controls and make quick, precise adjustments to temperature and humidity as needed.

In the radiation-oncology department, for example, water temperature is vital to running a sophisticated linear accelerator, which performs external beam radiation to treat cancer patients. If inaccurate temperatures shut down the accelerator, it can take several hours to warm up again and runs the risk of delaying patient treatments. It was therefore imperative to ensure comprehensive programming of the critical alarms to prompt an immediate response to any fluctuations in the accelerator's water temperature.

EMNE installed an Alerton IBEX™ system that controls, manages and monitors all of the hospital's building systems. The Emerson Hospital project includes hot water and chilled water plants,



A rooftop unit: Envision for IBEX offers intuitive displays so precise system status and information is always at your fingertips.

cooling towers, air handling units, VAV boxes, exhaust fans and air distribution systems. Operator workstations—distributed over the hospital's Ethernet local area network (LAN)—were installed to run Alerton Envision™ for IBEX software, which manages all the building's functions.

Before implementing the Alerton system, EMNE and hospital engineers completed a detailed survey of each section and compiled a systems database that helps them strategize how new equipment will most efficiently interoperate with the old. EMNE also conducted a comprehensive energy analysis of all Emerson utilities. Based on the hospital's greatest need and a quick return on investment, engineers recommended which systems to upgrade first and how to improve the operation of existing systems.

EMNE automated a switchover each winter from two working chillers to one. In colder months, the hospital requires only one operating chiller because outside temperatures are significantly lower and the incoming air needs less cooling. This change reaps considerable energy cost savings for the hospital.

Envision for IBEX enables the facilities staff to respond specifically to the particular needs of each environment. Temperature and humidity in recovery rooms are closely monitored to keep patients comfortable while pressurization differentials on infectious floors thwart airborne pollutants. With centralized access to all HVAC

OUT of all the different building automation systems I've seen in my career, this one is a cutting-edge technology, extremely friendly to use, and provides many benefits for the daily operations of our hospital.

Tim Savoie
Maintenance supervisor
Emerson Hospital

system components and customizable graphics interface screens, hospital maintenance staff can quickly view and adjust these setpoints from their offices.

24/7 alarming and broadcasting of critical events to workstations and pagers allows quick responses to unscheduled changes within the HVAC system. The flexibility of the IBEX system supports the many alarms required by Emerson staff to accurately maintain the system, especially in the radiation-oncology areas. If water temperatures in the linear accelerator stray from the pre-determined setpoints, crucial alarms immediately notify the facilities manager. Once alerted, he can correct the problem and keep the accelerator operational for patients undergoing treatments.

Direct Digital Controls (DDC) replaced the hospital's existing pneumatic system, which consumed numerous maintenance hours and required frequent calibration. Since pneumatics must be adjusted by hand, automating them with DDC and tying them into the centralized control system translates directly into maintenance cost savings.

By leveraging the old equipment and making it interoperate with the new Alerton equipment, Emerson

enjoys a cost effective building solution. The new controls are easy to use, extensible and more effective. Their energy efficient operation keeps patients comfortable while still generating significant savings for the hospital.

Project Scope

- 2 operator workstations
- 6 global controllers
- 360 field controllers
- 7 steam boilers
- 4 steam to hot water heat exchangers
- 2 chilled water systems
- 1 cooling system for linear accelerator
- 3 Liebert units for Computer Center
- 14 air distribution systems
- 220 VAV controllers
- 8 operating rooms
- 12 fan-coil units
- 42 critical alarms for the blood bank, medical gas and generators