



T.E.C. NEWS QUARTERLY



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If You Build It, They Will Come!

In An Era Of Power Hungry Workplaces,
360 Madison Avenue Minimizes Utility Costs And Attracts Tenants

Like towering divas, skyscrapers command the urban stage. They hold us enthralled, leaving us anticipating their next majestic manifestation. They have been praised as efficient space-savers, and adversely denounced as rapacious consumers of light and air. The latter concedes office buildings consume operating budgets as voraciously as they consume energy. In fact, office building energy bills are the highest of any commercial building type. While office equipment now accounts for almost one-fourth of an office building's energy use, heating, ventilation, and air conditioning (HVAC) and lighting are still the big power consumers. The good news is that the business of owning and/or managing commercial real estate has seen dramatic changes over the last few years, including the number and types of tools available to improve efficiency and reduce cost.



The newly built \$65 million office tower, located at 360 Madison Avenue in midtown Manhattan, is a splendid accomplishment in architecture, offering a modern space that is attractive and convenient. Developed and owned by the Madison 45 Co., it has a space inventory comprised of two structures amalgamated into a superb edifice totaling over 355,000 square-feet. The 26-story office building utilizes built-out decorative features to accent its vertical and horizontal mullions. With numerous set-backs that incorporate a balance of aluminum and glass parapets, the design stands out as a fresh new façade in an area of nondescript buildings.

Tenant's Right To Choose

Notwithstanding their aesthetic and geographic appeals, developers realize that today's marketplace commands much more than the traditional amenities afforded to tenants in the past. The twenty-first century tenant requires the flexibility to know exactly what is driving

Inside this issue:

What's New?	2
Cover Story Continues	2
Verizon Upgrades	3
In The Spotlight: '02' Top Projects	6

We specialize in:

- HVAC SYSTEM CONTROLS
- OPEN/INTEROPERABLE TECHNOLOGY
- SYSTEMS INTEGRATION
- FIRE/SMOKE CONTROLS



Continued on page 2, 360 Madison...

What's New?

580 Madison Avenue - Dahesh Museum of Art - T.E.C. Systems, Inc., via a contract from Donnelly Mechanical Corp, has been selected as the BAS contractor for the Dahesh Museum of Art project which will occupy the ground floor and lower level space previously occupied by the Freedom Forum. New equipment for this tenant space will be integrated into the existing American Auto-Matrix base building system. Project completion is scheduled for approximately mid to end August, 2003.

NYU Medical Center Radiology Unit - T.E.C. Systems will provide controls and wiring for rooftop chillers as well as associated pumps and plate heat exchangers that support an MRI facility. The project is a Honeywell stand-alone DDC system with the requirements for ModBus interface.

BACnet Conference 2003

October 5-7, 2003
Cincinnati, Ohio
<http://www.bacnetassociation.org>

LonWorld Trade Show and Echelon Developers' Conference

October 15-16, 2003
Munich, Germany
<http://www.lonworldexpo.com>

Greenbuild Int'l Conference / Expo

November 12-14, 2003
Pittsburgh, Pennsylvania
<http://www.greenbuildexpo.com>

Con Edison - T.E.C. Systems, Inc., has been engaged by the mechanical engineering firm of Gottlieb Skanska to provide a building automation upgrade

at Con Edison's East River Generation Plant in New York City. T.E.C. Systems' scope of work is to furnish a Honeywell Excel 5000® system to automate the control of approximately 25 ventilation fans and other ancillary equipment.

Verizon 111 Main Street - T.E.C. Systems, Inc., via a contract from HMS Mechanical will complement its long history with Verizon through two new projects at the company's 111 Main Street facility in White Plains, New York. T.E.C. Systems will add the controls required for a new boiler plant and incorporate such controls into an existing Honeywell system. Concurrently, the company has also been retained to furnish air handling unit controls to optimize an environment suitable for critical telecommunication systems.

360 Madison Avenue

Continued from cover

energy consumption and confidently implement changes that will provide hard cost savings. This fundamental understanding brought to bear the enviable challenge to maximize 360 Madison's commercial appeal on the

local and national marketplace through enhancements of standard amenities, whereby ensuring a comfortable, productive environment for the tenants.

To complement the building's bold visual gestalt, moreover, for bottom-line savings, T.E.C. Systems Incorporated was retained to supple-

ment the mechanical systems with high-technology, high-efficiency control parameters to maximize performance and utility savings. Jaros, Baum & Bolles, the Mechanical, Electrical & Plumbing Engineer on the project, had developed a full implementation plan, indicated services required, time frames, and estimated expenses. These evaluations led to the installation of an integrated Honeywell based Building Management System (BMS) to automate the flow and accountability of the work processed by the multiple mechanical operating groups within the facility.

System Architecture

The mechanical system features an array of typical floor package air conditioning (AC) units (Manufactured by McQuay International), exhaust fans, condenser water system, chilled water system, perimeter hot water system, emergency generator fuel oil system, and variable air volume terminal units.



Telecom Giant Leverages Open System To Its Advantage

Telecommunications ("Telecom") is a mammoth industry, encompassing companies that make hardware, produce software, and provide services. Speed, dependability and cost-efficiency are critical in this exceedingly competitive marketplace. Before a telecommunications company can present the latest new service to customers, it must have the environmental infrastructure essential to support guaranteed reliability of its communications infrastructure. This may include power monitoring, heating, ventilation, and air conditioning (HVAC), cooling, security, life safety, and alarm and event management systems that together provide an invaluable window into a company's critical infrastructure.

As systems have continued to evolve, and automation has taken on an ever increasingly important role in facility



management, stakeholders, such as telecom behemoth Verizon Communications, are abandoning the traditionally proprietary building management setups, and embracing the Open Systems evolution. Created in 2000 when Bell Atlantic acquired GTE, Verizon is the largest local phone service provider in the U.S. with control of one-third of all local phone lines. Verizon Wireless, the company's joint venture with Vodafone, is the



leading wireless provider in the nation with more than 29 million customers. To complement its state-of-the-art data management center, Verizon selected a state-of-the-art building automation system (BAS) standardized to a LonWorks based solution from Echelon Corporation. Located at 50 Varick Street in New York City, the mixed-use facility presents a highly demanding environment for HVAC and lighting, ranging from battery,

The condenser water system consists of a two-cell cooling tower with fans that are furnished with variable frequency drives (VFD) as well as variable speed water pumps. The perimeter hot water system includes two steam-to-hot-water converters and variable speed water pumps equipped with VFDs. The fuel oil system contains a fuel oil tank and a duplex fuel oil transfer.

Controls Optimization

The diversity of the mechanical installations necessitated a (BMS) capable of communicating across a multiplicity of proprietary networks. The system would have to account for equipment and environmental monitoring, scheduling and logging, and provide a consistent and positive customer experience. Because of its scalability and adaptive infrastructure, Honeywell's EXCEL 5000® building automation platform emerged as the system of choice. The EXCEL 5000® system is the cornerstone of Honeywell's com-



T.E.C. Systems' technicians configure, test, and commission local controls panels throughout the facility.

prehensive HVAC solutions, which features technology for every element of mechanical system control. It provides a powerful platform for the open integration of a variety of products across a selection of vendors through a single graphical interface. Since its inception as a Honeywell Authorized Network Integrator in 1995, T.E.C. Systems has provided, installed, and commissioned dozens of systems structured to the Honeywell standard.

To manage the functionality of all the components, T.E.C. Systems engineered a direct digital control (DDC) system with pneumatic actuation to interconnect each device to the BMS. To that end, the company provided direct digital control of 30 water-cooled, stand-alone AC units. The company also had the distinct responsibility for installing and commissioning McQuay's Open Protocol Master (OPM) interface panels to work in conjunction with McQuay's Microtech controllers. Programmers and developers from the company coordinated extensively with both Honeywell and McQuay personnel, to work through the needed technical configurations in order to bring the controllers on-line. These components were then made accessible through the BMS via Honeywell's Open Link for McQuay: a communications vehicle that facilitates the interconnectivity of McQuay controllers to the Honeywell platform.

Continued on page 5, 360 Madison

computer, and carrier and switching rooms to personnel offices. Managing such an intricate infrastructure-and managing it within a fixed budget-is a revolving challenge. A contributing force behind the pressure to make the change was economics. With reduced budgets and downsizing, Verizon needed a more cost-effective way to do business. Subsequent factors and concerns included system reliability, room for future growth, and the adaptability of the system to future requirements. The underlying agenda was to bring about a BAS that could maximize efficiency as well as utility cost savings.

The Power to Choose

The BAS was characterized by a plethora of equipment manufacturers, each conforming to the relevant stan-

company was subjugated to a costly dependence on these proprietary system manufacturers for upgrades and expansions. And had any of those equipment manufacturers go out of business or no longer support a particular installation, Verizon would have found itself having to replace what they had or amass a number of different systems that could not communicate or exchange data with each other.

In 2001, Verizon took advantage of a planned retrofit and extension of the existing BAS and operator workstations to introduce LonWorks technology, a non-proprietary architecture that provides an open network to which many systems can be integrated. The LonWorks solution for open systems has gone a long way towards alleviating

Open Systems Alliance has been a leading integrator of LonWorks based systems since 1995.

System Design

The first phase of the system included the installation of a LonWorks Network Services (LNS) database, and a standard Graphical User Interface (GUI) to display all raw sensor data on the Server PC using customized Wonderware™ programming. LNS provides a powerful client-server architecture that permits multiple installers to simultaneously configure the control system. This capability simplifies the task of training installers, allows device manufacturers to give the programming interface a unique look and feel, and permits tool vendors to offer products that are both unique looking and interoperable. Notable features of the GUI includes simple point-and-click navigation, graphs all raw sensor data on real-time and historical time charts, allows for each cell, line, or area to be easily viewed, thus showing multiple comparisons on graphs, displays desired ranges of each sensor and the real-time point within the range, and displays high and low alarms, if desired, on each display window. Additional network infrastructure components included LonWorks free-topology twisted-pair backbone, Magnatek networkable variable frequency controllers, Neurologic networkable temperature and humidity sensors, and Echelon's LonMaker for Windows configuration tool.

Subsequent phases included the addition of Plexus LDX-10 user interface panels, Echelon LonPoint control modules, and i-LON 1000 internet routers, upgrade to an Internet Protocol (IP) backbone, and installation of additional Yaskawa variable frequency drives and neurologic sensors.

Results & Conclusion

The trend in the industry is clear. Facility management guidelines are progressively more oriented towards

Continued on page 5, Verizon



dards to ensure interoperability, but each implementing those parts not covered by an applicable standard in their own way. One aspect of building automation systems, and the one that continues to be of interest to Verizon, is its management. This is an essential area in any medium to large systems, but is one that is fraught with problems. Many utilities and products exist to manage a system. Unfortunately the majority of these products tend to be vendor specific. At Verizon, this lead to a situation where the system consisted of inhomogeneous equipment from a variety of vendors. As a result, the

an owner's dependence on proprietary building automation systems, by making device dependent information available in a standardized way.

Choosing a LonWorks based setup means Verizon is no longer bound to a single provider of any system or product at 50 Varick Street - selection of a vendor is now based on performance, features, and costs. Through its bid, T.E.C. Systems Incorporated was selected as the controls integrator to implement the LonWorks upgrade. T.E.C. Systems, an Echelon Authorized Network Integrator and member of the

Verizon Upgrades

Continued from page 4

interoperable and non-developmental items. This metamorphosis is affecting all manner of communication systems, from management of information systems to mechanical infrastructure and other mission critical systems.

For Verizon, Open System products offer the advantage that devices can be selected from among different manufacturers: the company is no longer tied to any one manufacturer's closed technology. Aside from the cost savings achieved by open competition, the company is safe in the knowledge that replacement products will be available if any one manufacturer goes out of business or discontinues products. Service contracts can be openly bid since no proprietary devices will be used, thereby avoiding single source service contracts. It is likely this shift to open systems will enable Verizon to insert technology faster. The key is that a standards-based open systems architecture affords the company the flexibility to take advantage of new technology that comes along, regardless of the manufacturer or vendor, provided it is compatible with the open systems architecture it has selected. This of course, was not possible with the rigid, custom-built, and proprietary systems previously in operation at the facility. ■

360 Madison Avenue

Continued from page 3

Insomuch, the OPM is an interface module that allows other proprietary networks to communicate with McQuay equipment. The system's Open Links are on a SERIAL network using RS485 communication to convert Microtech data from the OPMs to Honeywell's C-Bus communication language. This conversion lets the system recognize and access the Microtech subsystems, allowing facility operators to easily monitor, schedule and access the AC units.

The BMS is monitored from a central location through Honeywell's Excel Building Supervisor (XBS) graphical user interface (GUI). The XBS is a state of the art building automation front-end, with 32 Bit graphic capabilities and modern software programming support, and capable of interfacing with other building systems and provides even more options to supplement the facility's future energy needs. All operator work is done through the GUI, which provides a uniform look and feel to the entire system and will greatly improve productivity of the building operators and managers. This integration allows for real-time information logging, audit trails, data aggregation across all devices, and enables trend reporting and analysis.

Conclusion

The roles played by the skyscraper are many. They are icons of cities, symbols of corporate power, and the place where many of us report to work every morning. The proliferation of interoperable and web-based technologies has led the evolution in how property management is done - an evolution that sig-

nificantly improves tenant retention, increase productivity, and facilitates the management of more square feet with fewer resources. In addition to cutting operating costs, energy-smart office buildings can actually enhance the comfort and performance of workers and boost productivity.

Many of the same measures that will maximize 360 Madison's energy performance will also make it a more comfortable place to work. Tenants will benefit from the use of day lighting and non-toxic chemicals, plus better temperature control, ventilation, and indoor air quality. With the high cost of labor, payback on these energy features is shortened even further when savings from reduced absenteeism are combined with energy cost savings.

Today, the facility is enjoying an occupancy rate of more than 90 percent, with many of its tenants acknowledging their initial attraction to the building as being its advanced technological and mechanical infrastructure, superior amenities, and the convenient midtown location. ■



In the Spotlight

2002 Top Projects

Challenges drive people to reach for something more, be it an idea, perspective, or solution. It is those exact challenges that drive T.E.C. Systems every day. We welcome the opportunity to bring order to chaos, to “build a better mousetrap,” and to give existence to that which may only exist in theory. Our approach to building automation and facility management services is strategically driven to create a symbiotic relationship with any controls-based project we are handed. We build a cohesive unit that looks professional, maximizes our clients utility cost savings as well as complement their business initiatives. Often, our commitment and participation are recognized by the construction industry. To that end, T.E.C. Systems is pleased to have its projects included in the New York Construction News’ top projects for 2002. Here’s how they ranked in the top 40.

- 1 AirTrain - \$1.2 billion**
Furnished and installed an integrated Honeywell based building management system (BMS) to automate the flow and accountability of the mechanical systems serving the new state-of-the-art AirTrain terminal.
- 3 Westin Hotel at Times Square - \$300 million**
Provided a comprehensive, flexible control-based solution for the economical operation of the Westin with the objective of offering guests the maximum amount of safety and comfort. Complementary installations included Honeywell’s Excel 5000® building management system.
- 21 JFK International Arrivals Terminal Landside - \$77 million**
To complement the new high-tech terminal, T.E.C. Systems was asked to provide an equally modern building automation system standardized to a Honeywell based solution. Notable installations includes Honeywell’s Excel Building Supervisory (XBS) graphical user interface.
- 26 360 Madison Avenue - \$65 million**
Supplemented the mechanical systems with high-technology, high-efficiency control parameters utilizing the Honeywell product line to maximize performance and utility savings. T.E.C. Systems engineered a direct digital control system with pneumatic actuation to interconnect a multitude of devices to the BMS.



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