© 2006, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (www.ashrae.org). Published in ASHRAE Journal Vol. 48, Nov. 2006. For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.



BACnet allowed TPMC Realty to choose a second building automation system to interface with the legacy control systems that existed in parts of the buildings.



BACnet[®] for Renovation

Mixing Old and New

By Randy Amborn

Park Towers are two, 18-story, 270,000 ft² (25 000 m²) commercial office towers in the upscale Galleria area of Houston. Built in the 1970s, they were fully operational buildings until the late 1980s. The buildings sat vacant and abandoned for more than 11 years until TPMC Realty Corporation purchased them in 1998. After a total asbestos abatement and a demo of the total interior shell of the buildings, the TPMC development team performed a total renovation of these assets. Inclusive in this renovation was a new expanded curtain wall (adding approximately 55,000 ft² (5100 m²) of lease space), roof, chillers, elevators, cooling towers and new M/E/P systems for the building. The buildings were reopened in January 2000.

Part of the renovation of the buildings included a building automation system (BAS) controlling the floors and airhandling units. However, as the leasing of the assets progressed, TPMC desired another BAS/HVAC supplier for approximately 60% of the unleased tenant spaces using variable-air-volume systems (VAV).

Mark Look, group chief for TPMC had issues with the legacy system's functionality in the areas of optimal start, alarm generation, and data trending. These were creating problems with tenant comfort and dissatisfaction, especially with the Houston heat. This problem was presented to several different contractors, none of which were successful in resolving this

About the Author

Randy Amborn is the marketing communications manager for Trane's Global Control Systems in White Bear Lake, Minn.



The building control units (BCUs) of the second BAS integrate with the controllers of the legacy system, without gateways, through BACnet.

critical issue. "If there's a problem, I want to see it before the tenants are affected." The BACnet[®] protocol enabled TPMC to choose a second building automation system with native BAC-net protocol. This system's open capabilities let it interface with the legacy control system in parts of the buildings. The building engineering staff now can perform monitoring and control tasks on points from both systems seamlessly on a single workstation and software. Look commented, "I can override points, modify points, change airflows and temperature setpoints."

BACnet allows point data from both systems to appear in a "dashboard" display that Look's operating staff can quickly peruse for problem areas. "When we arrive in the morning, sit down at the workstation and want to see what the building is doing, we just hit one keystroke and it gives us a snapshot. All the critical data: discharge temps, chiller operation."

The transition to a BACnet integration enabled Look and his team to troubleshoot and remedy operational problems. "Once we got the optimum start and data trending log generation functioning properly, then we were able to identify problem areas and make immediate corrections to the system." This was a critical point of concern due to the fact that the tenant leases stipulated that the lease spaces must reach a target temperature by a specified time. Look also states that "optimum start has definitely produced savings of energy dollars. It automatically does the calculation on when to initiate cooling based on the history of what the system did yesterday and the day before. Another plus to the system is that you have the capability of modifying how that calculation works; whether you look at the highest, lowest, or average temperature."

Technical Considerations of the Integration

Implementing the integration required a working knowledge of each system's BACnet details. The system-level controllers in the legacy architecture had BACnet communication capabilities, no additional gateway hardware was required to accomplish the integration. All points in the legacy system were BACnet objects, but were not set up to be controlled through BACnet, so a point on the controllers saying, "Yes, I'll respond to BACnet" had to be enabled. Schedules in the legacy system were disabled.

About equal time was spent on the legacy and new system to accomplish the integration. Problems involving improper numbers of hubs on the buildings' network were uncovered. Reconfiguring the network solved communication-related issues. Software from both systems resides on a single workstation. The legacy software is used only rarely for service tool functions. Daily operations and all other functions are performed in single-seat manner.



BACnet Boosts Tenant Satisfaction

In an aggressive and competitive real estate market such as the Galleria, Steven Seltzer, executive vice president of TPMC Realty, said, "we were looking for something different, a socalled competitive edge." The integration via BACnet enabled a consistent level of comfort that was crucial in marketing the buildings for lease to prospective tenants. Not only by defining a state-of-the-art design but a building operational system that complemented it. "The more stable the system is, leads to an overall stable operation. This improves our position as the build-

ings age and our lease space approach second generation usage," says Look.

BACnet also enables another amenity the TPMC team and their tenants find important, which is an interface to a tenant services software package that lets tenants request after-hours air conditioning and automates billing. BACnet protocol provides the interface between this software and BAS/HVAC systems.

Says Seltzer, "The days of calling the building management office to program after-hours HVAC are over. The system is phenomenal due to the simple fact that a tenant can program after hours HVAC up to one year from the required date. It is as simple as calling from a land line or cell phone anywhere in the world to program the system. The system is userfriendly and walks the tenant through the programming process. This is a true amenity to Park Towers! In the heat of a Houston summer weekend, this can make a huge difference in comfort and productivity. Corporate tenants appreciate that the system allows billing to the department that is actually working after hours and consuming air conditioning." Mark Look credits the tenant services system, and its BACnet connection into the comfort and control systems, as well as streamlining the end-of the-month utility billing.

Conclusion

Look credits open system standards as factors in the property's success. "BACnet enabled us to interface the original building automation system into the new system and we've gained benefits including tenant satisfaction, improved operations, reliable uptime, and marketing differentiation." Seltzer says the asset from an operational standpoint is "outperforming the market" and boasts a prestigious tenant mix that would have great appeal to any Wall Street investor.

Advertisement formerly in this space.