case study

University Uses Edge Control to Solve its Most Vexing Comfort Issues

INTRODUCTION

When other institutional property managers want proof that an open, flexible path to the smart campus exists—one that doesn't hand the reins of control over to any one solution vendor or energy services company—this state university in the Southeast United States often gets a visit. It has a mix of buildings that includes hospitals and healthcare spaces, classrooms, business offices, research buildings, garages, plants—buildings from every era over the last 100 years. Heating, cooling, lighting and securing all these properties involves a great array of equipment of many makes and models.

CHALLENGE

When the Niagara Edge™ 10 was introduced in 2018, this university was among the first customers to deploy the devices, taking a Niagara-at-the-Edge approach to address challenges with equipment and buildings without building management systems. For example, the cooling system that served one of its smaller administrative buildings had no ability to do scheduling—i.e. to pull back operation to save energy on nights, weekends, holidays and school breaks when the space was not occupied. This property was designed as four zones by the original HVAC contractor, and each zone is served by a dedicated fan-coil air handling unit. In this busy administration building, people run meetings in the area close to the fan-coil units. Occupants asked to retain the ability to turn the units on and off to control noise.

SOLUTION

To gain scheduling capability, the university facilities team retrofitted the units with Niagara Edge 10s, and they replaced the in-building thermostats with newer BACnet-over-MS/TP thermostats from a third-party. This relatively simple and cost-effective retrofit now enables remote monitoring of HVAC performance. The university's energy management services partner can include data from this building in its efforts to optimize energy efficiency across the whole campus. The team can now also proactively manage building comfort. When they note that discharge air temps aren't as expected, they can check out the fan-coil unit involved and do any necessary maintenance and repair, rather than waiting for a breakdown and complaint calls.

The main purpose of adding on the in-building thermostats was to satisfy the occupant request for local control over fan-related noise. Now occupants can turn the air-conditioning units off or on, but

EXECUTIVE SUMMARY

Project Type: Centralized energy management and comfort control

Client: University in Southeast USA that includes 400 buildings across an 800-acre campus, including hospital buildings, science labs, and classroom space. On-campus utility includes multiple central plants.

Key Technology: Niagara Edge 10 to change the economics of rolling out Niagara Framework to smaller, older and special-purpose buildings

Benefits: Energy Savings, Cost Savings, Efficiency Gains in Operations & Maintenance, Occupant comfort and health

"Across our campus — even in our older buildings — we've proven that you can integrate systems from multiple vendors using Niagara Framework and BACnet. Open integration seems like a basic first step to us now, but for many other camput facility teams, it is a new concept. We regularly host site tours because people want to see first-hand that the open alternative works."

Controls Engineering Supervisor
University in Southeast USA

they cannot lock them off or on. The set-back logic will take effect automatically after a period.

The Controls Engineering Supervisor also explains how he is staying ahead of hot/cold calls — proactively taking action before they happen. He says, "I trust the Facilities Maintenance Technicians who have years of experience dealing with the nuances of the compressor to advise me on any changes to the sequence of operations."

NEXT STEPS

The university was one of the first users of Niagara Framework's ACE deterministic engine. The Controls Engineering Supervisor comments:

"When Niagara 4.8 was announced, we were interested in being a beta because we saw value in how Niagara developers were reaching toward 100% uptime for the Niagara Edge 10. The new ACE meant we could program live and avoid shutdown when making changes to logic and we would have faster start-up times, similar to Niagara wiresheet programming. We do not experience power outages often, but it's nice to know that if we must restart the Edge 10, it can be controlling the fan-coil units in seconds versus minutes.

"We strive to be flexible in how facilities serve occupants and to continually optimize energy performance. Building engineers are going to always be asking me to make the fan run a little longer, to make the cooling phase a little shorter, to lengthen the delay in the compressor and to do other such tweaking of the logic. With ACE, you don't have to completely shut-down and restart when you make changes. You also program ACE logic with familiar wire-sheet functionality. You don't need to learn a new tool. I can go about my work with minimal disruption to the people inside the buildings – these could be patients or students or busy university administration workers. We can be more productive without impacting their comfort or safety. Beyond that, being a beta site for Niagara software means playing with something new which is just fun."

The Controls Engineering Supervisor made this interesting observation about his role as the campus Niagara programming expert: "Now I have 7 years of experience taking the direction of building engineers and listening to the feedback of occupants. Basically, I translate all that into Niagara logic. Software development teams attempting to build solutions for digitalizing building operations would do well to spend some years in my shoes, dealing with the physics of old buildings, the limitations of mechanical and electrical equipment, and the overriding charter to keep occupants comfortable and safe every day. Then they would better understand the context of the problems they are trying to solve."

"To create the application that now controls and schedules the fan coil units, we started with the application templates that come with Niagara 4. With templates, we can create an application once and deploy it to all the Edge 10s involved. This made deploying the Niagara Edge 10s a relatively easy and cost-effective swap-out for original thermostats, and it did not require any wall penetrations. "

Controls Engineering Supervisor
University in Southeast USA

NOTE:

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