

The Siemens logo, consisting of the word "SIEMENS" in a bold, teal, sans-serif font.

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## Rhode Island Office of Energy Resources fosters improved workspace with more comfortable, efficient operations

State addressing software and controls to overcome aging infrastructure and combat rising energy costs

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The State of Rhode Island is home to a tremendous number of cultural attractions, stunning beaches, dining and nightlife destinations, and outdoor recreational activities. The richness of all the Ocean State has to offer combines with world-class educational opportunities to make it a sought-after place to live and work.

The Rhode Island Department of Administration (DOA) manages two primary functions: the delivery of core business services and oversight of state agency operations. It is the goal of the department to deliver services to agencies through processes that are predictable, equitable, efficient and cost-effective so that all executive branch agencies can best serve Rhode Islanders. The Department and its agencies, which reside in a 30-year-old, 250,000-square-foot building on the state's Capitol Hill, implement state policies and coordinate programs while overseeing the budget and taxpayer dollars.

The Rhode Island Office of Energy Resources (OER) is housed within DOA, and its mission is to lead Rhode Island to a secure, cost-effective, and sustainable energy future. OER works closely with private and public stakeholders to increase the reliability and security of our energy supply, reduce energy costs and mitigate price volatility, and improve environmental quality.

George Sfinarolakis leads OER's Lead by Example program to oversee and coordinate efforts at State agencies to reduce energy consumption and greenhouse gas emissions across the public sector. "Rhode Island is committed to increasing energy efficiency and clean energy projects; we have an executive order from our governor that sets targets for efficiency, renewables, and clean energy across State government," said Sfinarolakis.

Monitoring energy consumption is not sufficient for achieving these targets, however, so Sfinarolakis says that the agency worked with Siemens to better understand how the Department of Administration building operates, how aging infrastructure contributes to high energy consumption, and how to improve comfort within the building as well.

### **Required manual overrides combined with lack of system visibility, posed daily challenges to building operators**

But instead of only tackling the building's energy-consuming components and equipment—such as air handling units (AHUs), chillers, pumps, light fixtures, and so on—Siemens recommended that the agency begin by upgrading the building automation system first.



"This was significant positive step forward for us. In other projects, you'd address building issues by going where you think the problems are, which often means looking for equipment and components that don't work properly. Here, though, we began with updating software and controls to drive energy savings and address scheduling, sequence of operations, and other energy components," explains Sfinarolakis.

In addition, because the building's automation system components were aging and becoming obsolete, building engineers lacked visibility into how the system was performing. According to Chief Property Manager Mark Barnes, "If a pump or sensor failed or if a fan was not working, we wouldn't know. By 8 am, when 750 people start arriving in the building, it was not uncommon for one or more of our zones to be out of order. We would hear from people that things were off, and then we would have to chase the problem, which required a great deal of manual overrides to bring in more cooling or heating, depending on the outside conditions."

### **Desigo® CC with comprehensive energy conservation measures drive savings and comfort for the State**

In partnership with Siemens, the State of Rhode Island upgraded its previous building automation system to Desigo® CC, and then implemented a comprehensive range of energy conservation measures as well as a continuous commissioning strategy that included:

- Air-side economizer and outside air optimization to repair and adjust AHU outside air dampers and actuators.
  - Chilled water, hot water, and condenser water temperature reset strategies.
  - New 30-ton, high-efficiency chiller for the central plant with variable frequency drives on existing secondary chilled water pumps.
- Together, these energy conservation measures are delivering monthly energy savings that range between 15 and 27 percent, according to Sfinarolakis: "It's incredible. If you take a weighted average of the savings, for a building like this, that's about \$15,000 per month we're saving in energy costs. And, if you're able to improve comfort significantly while gaining efficiencies, it makes for a very good story."
- It is, in fact, a good story – one that meant the project has been nominated for the state's "Lead by Example" award, which recognizes government agencies, municipalities, colleges and universities, and other similar organizations for their achievements in energy efficiency and renewable energy projects.
- Moreover, Barnes notes that the building operators receive far fewer calls and complaints about building comfort now. "For many in our building, our employees are sitting at their desks for the majority of the day. If you're freezing all day, or overheating, that affects employee performance and morale. We want to reduce those stress factors, so our public servants have a safe and healthy environment to conduct their work and maximize productivity on behalf of the people of Rhode Island," he explains.

### **Proper ventilation systems contribute to employee health**

Although the work on this project was completed many months before the

COVID-19 pandemic, system operators noted another benefit to the system: improved air circulation. Because viruses like the one that causes COVID-19 can spread more easily in poorly ventilated rooms, building operators are now looking into strategies that may help prevent the spread of illness, including the upgraded air filtration, increased air exchange rates, and bringing in more outside air.

At the time of publication, most State of Rhode Island employees are working from home, but once they return, they will experience improved office ventilation and air quality, which can have the added benefits of reducing symptoms of seasonal allergies, making for a more comfortable work environment where employees can focus on what's most important.

### **Preparing the State of Rhode Island for its future**

Looking ahead, Barnes says the monthly energy savings can be reinvested into continued building improvements such as lighting upgrades, high efficiency motors for mechanical equipment, and the like. He goes on to say, "wherever we can have substantial impact on operational costs, that leaves funds available to make additional upgrades. Energy savings measures feed on themselves; the better you do, the more funds you have to do more of them."

Sfinarolakis concludes: "The project with Siemens gave us a much better understanding of the significant role building automation systems can play in energy efficiency and management, as well as building comfort."

Just as importantly, the first phase of work completed in this state building means that the Office of Energy Resources is now prepared for the next generation of technologies so that they can take advantage of remote services and advanced analytics in the near future.



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