Case Study

Tecogen®

Advanced Modular CHP Systems

CH-200x - STx Series Water-Cooled Chiller

The Marine Biological Laboratory

(MBL), now a century old, is the oldest private marine laboratory in the country. Currently, it has a year-round staff of around 275, including many world renowned scientists. Every summer, the campus swings open its doors to welcome 1,400 scientists to study the diverse marine organisms found in local waters, including sea urchins, lobsters, squid, horseshoe crabs, and dogfish sharks.

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Armed with a $15 million grant awarded by the Howard Hughes Medical Institute and a $10 million grant awarded by the Massachusetts Life Sciences Center, the MBL is working hard to incorporate energy efficient features into renovations of its Loeb Laboratory. To maximize energy improvements, the MBL will cool the facility using a natural gas engine-driven chiller made by Tecogen, a leading manufacturer of combined heat and power products. The 200 ton STx series chiller will be the fifth Tecogen chiller installed on campus since 1993. "This funding presents a wonderful opportunity to continue working with Tecogen to keep the facilities updated with the most efficient technology" said Richard Cutler, PE, MBL's Director of Facilities, Management and Projects.

"Before we installed our first Tecogen

chiller we didn't have a cooling system. We'd just open windows. We considered the ocean breeze to be authentic Cape Cod air conditioning," said Cutler. Initially, Cutler's team attempted to cool the labs with an ad-hoc system of window air conditioning units and fans. Not only were there mechanical problems with the units but they were highly inefficient and caused a serious impact on the campus's operating budget.

"We knew it was time for an upgrade" but being located in such a remote area presented major challenges, particularly with constrained power availability during the peak summer months. It soon became clear that cooling the labs with electric chillers was not a financially viable option; a low-cost sustainable solution was needed. Cutler noted "Natural gas cooling became the ideal choice for the MBL because it significantly reduces energy costs by avoiding the electric demand charges during its peak-cooling season."

"Sweet, simple, and efficient—that's the appeal of Tecogen," said Cutler, who is one of the few engineers on campus amongst a sea of marine biologists. Since joining the MBL in 1986, Cutler has worked hard to ensure the quality of the MBL facilities. Installing a cooling system may not generate the same attention as a major biomedical breakthrough in the lab, but modernizing the facilities is as important as any project at the MBL, said Cutler. "I worry about the buildings so the scientists can focus on their research."

Recently, the MBL launched a sustainability plan outlining its goals to significantly reduce energy use, water use, and greenhouse gas emissions. The TECOCHILL chillers burn natural gas, a fuel which produces the lowest carbon emissions of any fossil fuel. Since the TECOCHILL chillers all come equipped to provide free hot water as a byproduct, the MBL can use the heat recovered from the chiller's engine for reheat / dehumidification in their labs. This results in cutting their carbon emissions by a factor of two when compared to an equivalent electric chiller.

The TECOCHILL uses the preferred R-134a refrigerant, which has a 95 percent reduced ozone depleting potential. From an ecological standpoint, this helps preserve the ozone layer and reduce the threat of global warming. "We chose Tecogen because they provide economically smart technology that is environmentally responsible—an unbeatable combination," said Cutler

"We are very proud to have the opportunity to work with such a prestigious institution," said Jeff Glick, Tecogen's Regional Sales Manager. The MBL's rich scientific history is reflected in the superior caliber of scientists it attracts, including 53 Nobel Prize winners. "It is extremely exciting to see our technology being utilized in a building that has produced some of the most groundbreaking scientific discoveries in history," said Glick.

Gas cooling is not only beneficial for the MBL, but also creates a better quality of living for nearby residents of Woods Hole. Several years ago, a noise consultant measured the acoustics around the facility after neighboring homeowners complained. The consultant recommended installing more natural gas-engine driven chillers and fewer electric chillers to reduce noise. The consultant's data confirmed that engine driven chillers create lower frequency noise and are thereby less offensive to the neighbors.

The Loeb Laboratory renovation project, which has already begun to move forward, is expected to be complete in June 2010. Based on previous experience, Cutler expects working with Tecogen will be a breeze from start to finish. "Our ongoing work with Tecogen is representative of their reliability and outstanding economic benefits," said Cutler. "They are a trusted partner we can depend on to help us make significant and sustainable growth."

As demonstrated by the MBL's experience over the past 16 years, natural gas engine-driven chillers should be an increasingly important cooling technology in the future.

For more information about Tecogen's
STx Water Cooled Chiller
or our other Natural Gas Engine-Driven Products please visit
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