

Case study

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The Wave Condominium

System upgrades reduce utility costs 17 percent, save \$65,000/yr operating expenses • Hollywood Beach, Florida

Built in 1969, the seventeen-story rental property on Ocean Drive in Hollywood, Florida, was converted to The Wave Condominium in 2004. The Wave, which includes 551 residential units and 23 retail and professional spaces, is directly east of the Intracoastal Waterway. Residents and guests of the facility can spend their days enjoying Beverly Beach located in front of the property and amazing sunsets in the evenings.

Challenge

The aging equipment at The Wave Condominium had exceeded its recommended service life and was badly in need of repair. One of the two natural gas steam boilers, generating steam for the primary source of heating and dehumidification, was original to the building and the other nearly twelve years old. The cooling system's two chillers were more than twenty years old and not meeting the energy efficiency standards of today. The building's control system consisted of a mixture of pneumatic and low voltage electronic controllers and devices, which were either decommissioned or had failed to function. The condominium association sought to bring the mechanical systems up to modern standards to combat rising utility costs, lower operational costs, improve building comfort, and position the condominium as a premier residential building.

Solution

While on location to complete other work, Aegis Engineering's Florida office, ASG, along with GM Engineering, conducted a comprehensive mechanical assessment of The Wave that included the boiler, chiller plants, air distribution and building automation systems. Looking at both one-for-one replacements and upgrade options, improvements were identified that would reduce energy consumption and operating costs. A phasing approach was outlined, where the energy saved from one project would



The Wave Condominium sought to upgrade its aging systems to reduce energy costs and increase comfort for residents.

fund the next, helping to maintain a healthy reserve fund without initiating a special owner assessment. Based on a long-standing relationship, Aegis contacted Trane to join the system design team.

Uncommon solutions provide exceptional energy savings

Condominiums have historically used standard HVAC systems to meet baseline efficiency requirements. Due to the long cooling season and humid climate in South Florida, energy studies were conducted to evaluate the benefits of installing an ultra-high-efficiency chiller, along with partial heat recovery to preheat the pool, and for dehumidification. The study convinced the owners that although the high-efficiency chiller and heat recovery weren't common solutions, with their energy-saving benefits, they were the best solutions.

Chillers meet best COP requirements

Adhering to specifications for the best Coefficient of Performance (COP), the ratio of heating to electricity used, as well as heat recovery capabilities, the property's aging chiller was replaced with an ultra-high-efficiency 500-ton Trane CenTraVac™ centrifugal liquid chiller with a multiple stage compressor and partial heat recovery. The unique design of the Trane centrifugal chiller with partial heat recovery actually increased the already industry leading efficiency of the chiller, effectively providing free heating to the building's domestic hot water, while improving the chiller's cooling efficiency. With the CenTraVac chiller using non-ozone-depleting R-123 refrigerant, and operating with a with Trane evaporator technology to reduce refrigerant charge, the chillers also reduce environmental impact.

Controls optimize chiller plant efficiency

A Trane microprocessor-based Tracer AdaptiView™ chiller control panel provides fast, accurate monitoring of chiller operation using an easy-to-navigate touch screen. The direct digital control (DDC) system is used to preferentially load the new heat recovery chiller and optimize operation of the cooling tower, pumps and heat recovery. Facility managers use a Trane Tracer™ SC system controller to manage energy use and conduct daily operations, such as changing system set points, viewing alarms and event logs, troubleshooting problems, time-of-day scheduling and custom programming. The web-based system allows easy access from virtually anywhere via remote devices, such as smartphones or tablets.

Results

Teamwork, planning and vision delivered a high performance, sustainable facility for The Wave Condominium, with increased energy efficiency, reduced cost and a more



A 500-ton Trane high-efficiency CenTraVac centrifugal chiller with partial heat recovery helps reduce operating costs and provides reliable comfort for The Wave Condominium residents.

comfortable environment. Using an integrated approach to design and construction, Aegis Engineering, and Trane teams in both Toronto and South Florida, provided a turnkey solution for the condominium upgrade. Aegis Engineering's oversight of the complete construction management process, combined with Trane expertise and local presence, helped ensure the project's smooth completion.

The team was able to meet The Wave Condominium's stringent goals, reducing average utility costs by 17 percent to 20 percent overall. The Wave Condominium has seen total building energy consumption drop by 13.2 percent and total building gas consumption drop by 21.6 percent, saving the facility an estimated yearly operating cost of \$65,000.

With the efficient system, The Wave Condominium has been able to turn its boiler off, allowing them to delay the installation of new boilers planned for redundancy. In addition, the building now has a newer chiller requiring less maintenance and a powerful, expandable DDC chiller plant control system. Pleased with the success of the project, The Wave Condominium is working with Aegis Engineering and Trane to replace a second 500-ton chiller and multiple air handling units in the building.



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