



Case Study Broward Financial Centre

Fort Lauderdale, Florida

*Major
Chiller
Replacement
Project
Completed
Over Three Day
Weekend*

Detailed planning and a tight project team were the keys to a major chiller plant replacement in a 320,000 square foot commercial office building over a holiday weekend. The 24-story Broward Financial Centre is one of the largest commercial properties in downtown Fort Lauderdale, Florida. Constructed in 1985, the center houses major clients including Templeton Investments and Citibank. The building also houses street-level retail space. The facility was acquired in 1994 by Crocker Realty Trust.

Crocker's investigation of the building prior to acquisition revealed shortcomings in the HVAC system. The major system components were two 400-ton centrifugal chillers in a penthouse location on the 24th floor, with adjacent outdoor cooling towers. The airside system included





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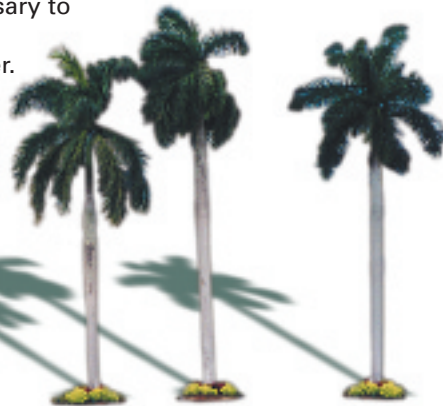
a central air handler on each floor with a VAV distribution system. In addition, the bank facility on the first floor had water source heat pumps supplied through the cooling towers.

One of the major problems was the condition of two original chillers. Eddy current testing revealed plugged condenser tubes, believed to be a result of earlier inadequate tower water treatment. Enough tubes were plugged to impair the efficiency of the chillers, plus the condition of many others was questionable.

Part Loading On Original Chillers A Problem

Another concern was that the chillers part loaded poorly. This facility operated on a normal five-day work week, but it was common for tenants to request continuing air conditioning service into the evening and through the weekend for special projects and activities. Under the original design, it was necessary to supply five of the large air handlers to load up the chiller. Often much larger spaces were cooled through the weekend than were required by the tenants. Maintaining chilled water for tenant schedule override was a requirement, but the cost of offering this benefit was unacceptably high.

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Crocker’s experience with the chiller plant increasingly indicated that improvements were needed. As the age and operating history of the original chillers were taken into account, it appeared that more than just retubing was called for. An energy efficiency rebate program from Florida Power & Light persuaded the owners to consider replacing the chillers with new, high-efficiency models. The property management company worked with a major Florida design/build contractor, Southeast Mechanical from Hollywood, to evaluate replacement options and strategies. Southeast also brought in representatives from The Trane Company to assist in developing chiller options.

Decision to Replace Chiller Plant

According to Sherry Canterbury, commercial property manager for Crocker Realty Trust, the decision was made in late 1997 to proceed with the replacement of the existing chillers. The company accepted the recommendation to use Trane Model

CVHE chillers with efficiencies in the area of .52 kW/ton at ARI conditions. In addition, Crocker decided to replace the original deteriorating cooling towers with new Baltimore Air Coil stainless steel units. The largest challenge in the project was scheduling the work to minimize tenant inconvenience. “This was critical for us,” says Canterbury, “and we knew it was especially challenging in this South Florida climate, where you need air conditioning all year long.”

Canterbury and her staff worked with Southeast Mechanical, Trane and other parties to come up with an aggressive plan. We targeted the replacement project for the Fourth of July weekend, 1998. “It’s pretty gutsy to schedule a project like this in the middle of summer alone. On top of that, we had to get it done in three days. It took a lot of planning and a lot of commitment.”

She tells how in the last few months, the problems with the old chillers increased. “Every day we would cross our fingers and hope for just

one more day.” Canterbury and staff also worked with their tenants months in advance of the project. The tenants needed to understand that there would not be air conditioning through the

Fourth of July weekend, therefore office use shouldn’t be scheduled. “We also had to clear all the vehicles from our parking lot and six-story parking garage to accommodate equipment delivery and crane operations. Of course several tenants have 24 hour operations which we accommodated with 18 spot coolers and 15 industrial fan systems.” She smiles and says, “It was pretty typical human nature – we sent out notices weeks in advance, but some of them were ignored. People *did* notice the tow trucks when they arrived, though.”

Changeover Scheduled for Holiday Weekend

Just before the weekend, the construction crane was assembled in the parking lot. The delivery of the chillers and cooling towers was scheduled for Friday, the first day of the weekend. Southeast Mechanical’s John Kneiss coordinated the site work. “As soon as the building emptied out on Thursday night, we went to work. We’d done a lot of prep work in advance, including opening up the wall in the penthouse to get access to the mechanical room.” Then on Friday morning, the full crew was at work. Southeast’s crew began by tearing down the old chillers and moving them out in big chunks. The cooling towers could not be taken off line and removed until Friday night after the regular business day for Citibank – a first floor tenant. This was because the towers also support water source heat pumps for the bank part of the building.

Kneiss notes that through the weekend, over 70 different trades workers were involved at the site. “In addition, Sherry Canterbury kept security people and engineering staff on hand at the site. We wouldn’t

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have been able to accomplish this without this level of owner cooperation. When we needed something, it was there. The team feeling was unparalleled.”

As soon as the old equipment had been moved out, the crane began bringing in the new system components – chillers, piping, valves, towers. Over the weekend, over 400,000 pounds of material was lifted on and off the rooftop. Kneiss notes that because of the time constraint, the job had been thoroughly planned and there were few surprises. “The installation really went smoothly. By 10 o’clock on Sunday morning, the new Trane units, along with the new towers, were up and running on automatic control, making chilled water at 44 degrees.” The changeover had gone even faster than the team had expected.

Completed Ahead of Schedule

Canterbury laughs as she says, “On Sunday afternoon, one of our senior executives drove by and didn’t see any sign of activity at the building. He thought we must have postponed the project. When I told him later that it was complete, he couldn’t believe it.” Since the project completion, Canterbury notes that the chiller plant operation has been trouble-free. “The chillers are very quiet and there are no tenant complaints about noise.”

The efficiency improvements of the new chillers are financially promising as well, though the operating history is still short. But Canterbury notes that the electric energy budget for the building for the month of August, based on previous years’ usage, was \$53,000. The actual usage was only \$46,000, even though August was hotter than normal. Canterbury

indicates, “We expect this operating expense to drop even more as we complete rebalancing of the system.”

The improved part load characteristics of the new system mean that it is practical to run a chilled water loop for tenant override cooling on weekends. The chiller just cycles to cool the loop water, and the tenant can draw on that for cooling. Kneiss points out that a building this size has a good chilled water reserve in the loop, so the chiller runs long enough to chill the whole loop. “Typically it comes on once an hour and operates at a low load level for maybe 15 or 20 minutes to bring the loop down to temperature. That works well for these occasional tenant override situations.”

Looking back at the conversion project, Kneiss indicates that it was challenging because of the tight timetable and the need to coordinate a lot of deliveries, equipment and trades. “Doing this on a summer holiday weekend was difficult. A lot of people were out on a limb, but we all worked together and made it happen. That was great.”



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