



Case Study – Coleman A. Young Municipal Center

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Vintage Chillers, State-of-the-Art Energy Savings at Coleman A. Young Municipal Center

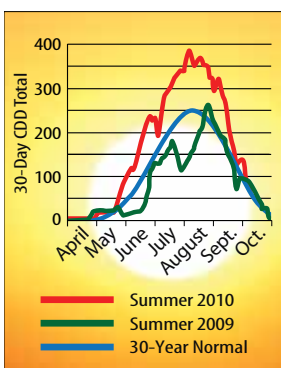
Objectives:

The Coleman A. Young Municipal Center is a two-tower high-rise in downtown Detroit. It houses offices, courtrooms and a library. The Center employs the original Carrier 17M chillers, installed in 1953, to keep the occupants comfortable. Although the chillers themselves were in good condition, the technology surrounding them, including a variable speed drive and controls, was aging, inefficient and increasingly difficult to maintain, putting occupant comfort at risk and driving up kilowatt usage. This resulted in excessive energy costs.

Solution:

Carrier upgraded the technology surrounding the 17M chillers, installing a new variable speed drive on one chiller and Carrier Product Integrated Controls (PIC) on both. Carrier also replaced one chiller's existing motor with a new 900 h.p. unit that returned that chiller to its original specified capacity. These upgrades, combined with load reduction efforts in the building, made it possible for a single chiller to cool the facility even at the peak of summer. As a result of the energy upgrade project, the Coleman A. Young Municipal Center chillers used approximately 26% less energy during the 2010 cooling season, in spite of the fact that the summer was Detroit's fourth hottest on record. The project has a return on investment (ROI) of two years.

Cooling Degree Days (CDD)



Even in the face of record high temperatures, the upgraded Carrier 17M chillers returned approximately a 26% reduction in kWh usage. The Coleman A. Young Municipal Center realized \$170,000 in cost avoidance over the previous year.



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"We have been extremely satisfied with the chiller upgrade. We were able to realize a \$170,000 reduction in electrical costs over the past year."

Gregory R. McDuffee,
Executive Director
Coleman A. Young
Municipal Center
2 Woodward Avenue, Suite 1316
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Synopsis:

The Coleman A. Young Municipal Center, known informally as the City-County Building, is a two-tower high-rise in downtown Detroit. It houses offices, courtrooms and a library, and has a work-day population of up to 2,000 employees, plus about 4,000 visitors at any given time. The Coleman A. Young Municipal Center is home to the government of the City of Detroit, as well as offices of the Wayne County government and judiciary and Michigan's Third Circuit Court. The property is owned by the Detroit-Wayne Joint Building Authority (DWJBA).

The Coleman A. Young Municipal Center is cooled by the two original Carrier 17M chillers that were installed in 1953 when the Center was built. Although the chillers themselves were in good condition, the technology surrounding them — including a variable speed drive (VSD), motor and controls — was aging, inefficient and increasingly difficult to maintain, putting occupant comfort at risk and driving up kilowatt usage. The need to curb excessive energy costs spurred the DWJBA to consult Carrier on energy upgrade options.

Carrier designed, installed and programmed the technology upgrade surrounding the 17M chillers, which included a new variable speed drive (VSD) and 900 h.p. 460 volt motor on one chiller, and Carrier Product Integrated Controls (PIC) on both. These improvements led to greater efficiency in a number of ways. First, the new motor and VSD returned the chiller to its original specified capacity; this upgrade, combined with load reduction efforts in the building, made it possible for either chiller to cool the facility alone, even at the peak of the summer. Second, the new VSD enabled the chiller to run more efficiently by matching speed to demand. And finally, the PIC controls enabled the chillers to attain their precisely targeted set-points with a minimum of effort. In short, the upgrade led to shorter run times and greater efficiency.

The PIC controls have additional benefits as well. Timothy Amburgey, Branch Manager for Carrier Commercial Service in Detroit, said, "Digital controls give the facilities staff much tighter control over the chillers, which translates to savings. But they also enable the staff to bring accurate, real time chiller data into the PC, which is invaluable for automating chiller plant operations."

As a result of the energy upgrade project, the Coleman A. Young Municipal Center chillers used approximately 26% less energy during the cooling season, in spite of the fact that the summer of 2010 was Detroit's fourth hottest on record according to the National Oceanic and Atmospheric Administration.

Gregory R. McDuffee, Executive Director for the Coleman A. Young Municipal Center, said, "We have been extremely satisfied with the chiller upgrade. We were able to realize a \$170,000 reduction in electrical costs over the past year, and now that we've lived with the new equipment for a season, we're looking forward to even better results next summer."

Project Summary

Location: Detroit, MI

Project Type: Energy Upgrade

Building Age: 53 years

Building Type/Size: High-rise office towers; 750,000 sf

Building Usage: Offices, courthouse, library, laboratories

Unique Features: Vintage 1950 Carrier 17M chillers upgraded to current controls, drive and motor technology

Major Decision Drivers: Aging Variable Speed Drive failing; cooling costs excessive; controls obsolete and increasingly difficult to maintain

Objective: Improve occupant comfort; reduce energy costs; prolong useful life of existing chillers

Design Considerations: Restore lost cooling capacity; improve operational efficiency; reduce equipment run time; enable single chiller to carry building load

HVAC Equipment: Existing Carrier 17M chillers; Carrier Product Integrated Controls (PIC), Variable Speed Drive, 900 horse power motor

Nominal Cooling Tons: 960 per chiller

Project Cost Range: \$250,000 - \$300,000

Upgrade Date: 2010

For more information, contact your nearest Carrier Representative, call 1.800.CARRIER or visit our web site at www.carrier.com