



Case Study

Newark Liberty Airport—Newark, NJ

Issue: 25-year-old HVAC system needed to be upgraded in a timely manner as not to interrupt travel schedules at this extremely busy airport

Solution: D&B Engineering supplied two Daikin 2150-ton centrifugal water chillers

Annual Energy Savings: \$750,000

Terminally *CHILL*

D&B provided Daikin chillers which were online and fully operational in mere months with no disruption to the airport

In addition to a sturdy suitcase and meticulous punctuality, staying cool at the airport also requires a reliable air conditioning system, which is why the Newark International Liberty Airport made the decision to replace its old, inefficient chiller system with new state-of-the-art energy-efficient technology.

The Newark Liberty International Airport is owned and operated by the Port Authority of New York and New Jersey. Located only 15 miles from Manhattan, the airport represents a vital transportation channel for travelers throughout the NY Metro region, substantially influencing economic development and quality of life in the two states.

REBATES AND ENERGY SAVINGS

Like many transportation organizations and businesses, the Port Authority is continually seeking new ways to reduce energy utilization and cut costs, while also striving to lower its carbon footprint.

One area identified as needing efficiency upgrades was the airport's cooling system. The old chillers on the lower level of the Newark Central Heating & Refrigeration Plant were over 25 years old, inefficient, and were operating beyond their expected service life. They used CFC refrigerant, which is now banned from production in the United States as a threat to the planet's ozone layer.

Recognizing the need for energy efficiency improvements, the Port Authority's utility, Public Service Electric & Gas (PSE&G), accepted the project into its Direct Install Program, a new energy saving initiative that helps municipal,

local and state offices fund upgrades to make their facilities more energy efficient. Through the Direct Install program, the Port Authority earned a rebate of \$5 million.

Upon acceptance into the program, the Port Authority formulated a master plan, including design and installation initiatives, to provide consistency throughout the renovation. PSE&G enlisted the help of a diverse group of project collaborators through competitive procurement. D&B Engineering of New Jersey (D&B) and Facilities Solutions Group (FSG) were chosen as a result of their proven track record in CHRP replacement projects.

"This project represents an outstanding cooperative effort between the Port Authority, PSE&G, FSG, and D&B. It would not have proceeded without the 80% incentives delivered by D&B from FSG and PSE&G," said Dharam Pal, chief mechanical engineer for the Port Authority. "The Port Authority is extremely pleased with this outcome. Everything that was promised in the early stages of development was delivered on time and within budget, which is crucial in the transportation industry."



PSE&G assigned FSG, one of the nation's largest single-source providers of lighting and electrical products, electrical services, and energy management solutions, to analyze the Newark Airport's energy consumption trends, rates, and demand charges, and identify ways to improve it. "We were the catalyst between the Port Authority and PSE&G. Our main focus was reducing energy consumption and helping to ensure they were able to take advantage of the incentives offered by PSE&G," said Bernard Erickson, FSG's program manager.

CHILLER REPLACEMENT

Along with the FSG the Port Authority teamed up with D&B Engineering to ultimately make a decision that entailed the installation of two 2150 ton state-of-the-art centrifugal water chillers manufactured by Daikin. Replacing the two existing, inefficient chillers will reduce CO₂ emissions by 3,600 tons per year and reclaim close to 10,000 pounds of CFC refrigerants. More than \$750,000 in energy cost as well as \$100,000 of maintenance cost will be saved each year, thereby reaching maximum energy efficiency.

"This project presented an exciting opportunity to improve a public facility for the general good and use of the community. We are very proud to have helped the Port Authority accomplish their energy savings goals," said Jeffrey Barat, a partner at D&B Engineering. D&B is a leading representative of world class manufacturers in the Tri-State area. In addition, they are also one of the most progressive representatives in the country for promoting and securing utility rebates totaling some



\$20 million in rebates and incentives within the last decade. D&B Engineering worked with Facility Solutions Group to carry out the Port Authority's master plan, which included engineering, design, construction activities, and procurement related to the installation of the chillers. D&B implemented the Newark Airport's central chilled water plant project on schedule and within budget. The scope of work performed by FSG, D&B Engineering, and the Port Authority included project management, construction, and securing the available rebates.

"Working with a public agency usually involves a very long review process but that was not the case here. With the help of D&B and the Port, we were able to get cooperation from all sides to get the Daikin chillers up and running," said Erickson.

The new Daikin centrifugal water chillers use an environmentally responsible non-HCFC refrigerant, HFC 134a, with no phase out date under the Kyoto Protocol.

"We are always driving to develop products that will lower both energy consumption and carbon emissions. Certainly, the Daikin chillers represent a prime example of how technology can be used to help both the economy and the environment," said Ray Good, Director of Marketing for Daikin (formerly McQuay).

As a result, the chiller replacement not only provides measurable cost savings, it also caters to the growing need for sustainable technology. "The Port Authority is fully committed to the notion of sustainability," said Pal. "The new chillers represent a win-win situation for us because not only do they generate energy savings, we also got rid of some equipment that was environmentally unfriendly."

PROJECT MANAGEMENT

Once the project was ready for takeoff in early October 2009, the main objective was completing the installation within the needs of

the Port Authority. "D&B and FSG were able to meet every one of the Port Authority's requirements. They never denied any of our requests or let anything become an obstacle," said Pal. The Port Authority's 90 years of delivering outstanding transportation infrastructure was also crucial to carrying out the construction process "The Port Authority's construction team did a tremendous job to ensure this project came in on time and

OPTIMAL SAVINGS

Newark Central Heating & Refrigeration Plant: Estimated First Year Savings

- Reduce CO₂ emissions by 3,600 tons
- Save more than \$750,000 in energy costs
- Significantly reduced maintenance cost

under budget. "I really have to compliment the engineering, design, and construction teams for their efforts," said Pal.

"Any construction project is a challenge, but this project was especially difficult because of the time limitations," said Barat. "The chillers had to be ordered, manufactured and fully installed in less than eight months."

Critical Path Method (CPM), the standard project management methodology provided the project team with the necessary tools to navigate these challenges. Barat's philosophy for a construction project is to "capture as much planning on paper as possible before going out into the field." This necessitated working with the design engineers during the conceptual stages to define organizational objectives in order to ensure everyone was in agreement regarding the basic parameters.

D&B, FSG and the Port Authority implemented a design agreement with RG Vanderweil for both engineering services and construction drawings. Once approved by the Port Authority, the team secured construction permits from required municipal agencies. Demolition of the old chillers was completed in just two months. D&B was able to reclaim and recycle all CFC refrigerants from the existing chillers.

The Daikin centrifugal chillers were tested at design conditions in the factory and verified by

Port Authority personnel. They were shipped pre-charged and in one piece to the jobsite on Feb. 30, 2010.

By taking their time at the start to formulate the project's scope, the project teams ensured the construction process went as planned. Barat recognizes effective planning requires collaboration. "It was a collective effort on every level. The Port Authority has been great to us. They were accommodating every step of the way in helping us get this project executed," Barat noted.

Immediately upon delivery, the two new Daikin WDC-126, 2150 ton, 460 volt chillers were installed. All construction work was completed in accordance with Port Authority standards, including electrical, structural and mechanical requirements. Daikin provided factory startup and five years of parts and labor warranty.

"Everyone involved was very responsive and capable from beginning to end. Many projects are often to put on hold because of time and money. The Port Authority, D&B, and PSE&G did everything in their power to avoid letting that happen. It's been an amazingly smooth project and a wonderful display of teamwork," said Pal.



For more information on D&B Engineering, Daikin chillers, rebates and incentives, please visit www.dbnj.com.



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