

Optimizing Datacenter Chilled Water Production

Corporate Office Properties Trust (COPT) (NYSE: OFC) is a specialty office real estate investment trust that focuses on office and data properties for the US Government, Defense Information Technology and Data sectors. COPT has its own in-house development and construction team that provides services for a portfolio of 253 properties totaling 19 million square feet. COPT's strategic focus is on technically sophisticated buildings that meet unique tenant requirements while being environmentally sensitive and sustainable. As a result, COPT was recognized for its environmental leadership by receiving the first national LEED-certified (Leadership in Energy & Environmental Design) Green Development Award for buildings in The National Business Park in Annapolis Junction, MD.

The National Business Park property currently includes three buildings that house datacenter and office facilities for multiple federal agencies. It represents a long term partnership with the U.S. government, and as a testament to COPT's high level of customer satisfaction, ground breaking is underway for three more datacenter facilities on the site.

To meet the government's operating timeline, the Baltimore design firm of **Whitman Requardt Associates (WRA)** decided on pre-packaged cooling plants for updating each of the three existing buildings. After considering COPT's strategic focus on sustainability and environmental impact and the datacenter's high reliability requirement, WRA opted for an adaptive control strategy and an industrial PLC platform. This series of choices led directly to successful relationships with two key partners.

Epsilon Industries, designed, built and tested a self contained packaged chiller plant for each building at its factory in Kingston, Ontario. Each plant was individually designed to meet the unique cooling loads and physical layout of the respective building it served; however, all three plants shared common equipment selections, hydronic design and control specifications in order to minimize on-going operation, maintenance and training issues.

The packaged plant approach minimized the overall time to completion in two ways. First, construction at the Epsilon factory eliminated the typical job site delays associated with weather, labor or logistical issues. Second, the on-site physical installation consisted only of rigging and connecting the electrical power and supply / return piping.

tekWorx, a control/engineering firm specializing in chilled water plant optimization, designed an adaptive control sequence to optimize the total plant kW per ton, implemented the supporting adaptive algorithms on an industrial PLC platform, and integrated the system with the site's existing building automation system (BAS) to facilitate remote monitoring of critical values, conditions and alarms

The PLC panel was installed at the Epsilon factory so that the majority of the wiring and control sequences could be tested before shipment to the site. After the plant was set in place and connected to the piping and power, the on-site control work was limited to a few wiring terminations and a simple BAS connection.

Testing consisted primarily of commissioning by the government's commissioning agent. The load and operating conditions were varied and the control sequence and adaptive algorithms were verified to be automatically adjusting the equipment operation in order to minimize the total plant kW per ton.



PROJECT SNAPSHOT

OWNER / OPERATOR

- Corporate Office Properties Trust

LOCATION

- Annapolis Junction, MD

DESIGN ENGINEER

- Whitman Requardt Assoc.

PROJECT CRITERIA

- Time to completion
- High reliability
- Optimized chilled water production (kW per ton)

SOLUTION

- Packaged chiller plant
- Adaptive algorithms
- Industrial PLC Platform