



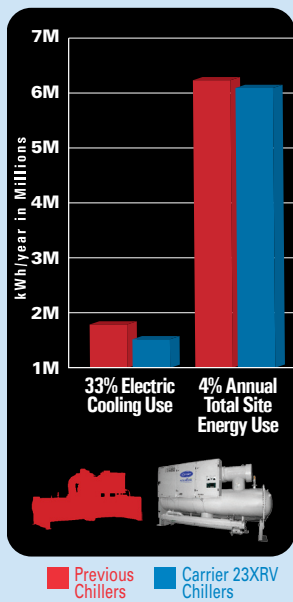
# CASE STUDY



## Washington Navy Yard

### CARRIER 23XRV AQUAEDGE® CHILLERS TO DELIVER ENERGY EFFICIENT COOLING AT NAVFAC

#### PRELIMINARY ESTIMATED REDUCTION IN ENERGY USE AT NAVFAC



According to a virtual energy audit analysis of Navy Yard Buildings 33 and 36, preliminary estimated energy savings due to the Carrier 23XRV AquaEdge® chillers will be in the range of a 33% for cooling, and 4 to 7% for total facility energy cost.

#### Project Objectives

Washington Navy Yard Buildings 33 and 36 comprise two halves of a single rectangular structure with a central courtyard. The facility, home to the Navy's Facilities Engineering Command (NAVFAC), is a multi-story office building of almost 300,000 ft<sup>2</sup> (27,871 m<sup>2</sup>), serving approximately 1,400 employees. One of the facility's two chillers was approaching replacement age, while the other was simply inefficient. The Navy has a mandate to maximize energy efficiency and reduce life cycle costs (LCC), so Energy Manager Nery Duron sought to replace the chillers with a high-efficiency model. The Navy had preferred magnetic bearing technology for new installations.

"The Carrier 23XRV AquaEdge chillers demonstrated high efficiency capabilities, which we expect to help reduce energy use at Navy Yard Buildings 33 and 36."

– Nery Duron,  
Energy Manager,  
U.S. Navy

#### Project Solution

After comparing the efficiency data of multiple chiller models, including those using magnetic bearing technology, the Navy selected two Carrier 23XRV chillers to replace their existing equipment. As part of the efficiency upgrade, the Navy also conducted a virtual energy audit analysis using an energy modeling application provided by Carrier. According to this analysis, preliminary estimated energy cost savings attributable to the Carrier 23XRV chillers are expected to be in the range of a 33% for cooling, and 4% to 7% for total facility energy cost.



## Synopsis

Washington Navy Yard Buildings 33 and 36 comprise two halves of a single rectangular structure with a central courtyard. The building, home to the Navy's Facilities Engineering Command (NAVFAC), is a multi-story office complex of almost 300,000 ft<sup>2</sup> (27,871 m<sup>2</sup>), serving approximately 1,400 employees. One of the facility's two chillers was approaching replacement age, while the other was simply inefficient. The Navy has a mandate to maximize energy efficiency, so Energy Manager Nery Duron sought to replace the chillers with a high-efficiency model. The Navy had preferred magnetic bearing technology for new installations.

A comparison of the efficiency data for several chiller models, including magnetic bearing units and the Carrier 23XRV AquaEdge<sup>®</sup> chiller, demonstrated that the 23XRV was more efficient than any competitor, contributing to a lower life cycle cost (LCC) for the Navy. The Carrier 23XRV is the world's first water-cooled variable speed screw chiller with an integrated variable frequency drive. The unit features a refrigerant-cooled, unit-mounted variable-frequency drive that enables the chiller to operate optimally across a wide range of part-load operating conditions. The Navy selected two 23XRV chillers for the upgrade project.

As part of the efficiency upgrade, the Navy also conducted a virtual energy audit analysis using an energy modeling application provided by Carrier. According to this analysis, preliminary estimated energy cost savings attributable to the 23XRV chillers are expected to be in the range of a 33% for cooling, and 4% to 7% for total facility energy cost.

Bryan Gassenmeyer, Commercial Sales Engineer in the Carrier Washington, DC, office, said, "The Carrier 23XRV chiller was the best option for the Navy, with their requirement to improve energy efficiency. And in addition to energy performance, the chiller also provides additional benefits of reliability, non-ozone depleting refrigerant and precision integrated controls — all at a lower first cost than the magnetic bearing technology chillers."

Nery Duron reiterated the importance of the Navy's commitment to energy savings. "With the Navy's mandate to maximize energy efficiency, we actively seek the most efficient solutions to all our facilities' requirements. The 23XRV chillers demonstrated high efficiency capabilities, which we expect to help reduce energy use at Navy Yard Buildings 33 and 36."

## Project Summary

**LOCATION:** Washington, DC

**PROJECT TYPE:** Energy analysis; chiller replacement

**BUILDING SIZE:** Almost 300,000 ft<sup>2</sup> (27,871 m<sup>2</sup>)

**BUILDING USAGE:** Offices

**OBJECTIVES:** Replace existing chillers; maximize energy efficiency.

**EQUIPMENT:** Two Carrier 23XRV AquaEdge<sup>®</sup> chillers

**MAJOR DECISION DRIVERS:** Carrier chillers selected over previously preferred magnetic bearing technology due to superior energy efficiency.

**UNIQUE FEATURES:** Virtual energy audit analysis software supplied by Carrier was employed to obtain preliminary estimated energy savings.

**INSTALLATION DATE:** 2014

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