

U.S. Coast Guard Integrated Strategic Command

Energy Savings Performance Contract (ESPC, 2005)



The United States Coast Guard (USCG) operates an Integrated Support Command (“USCG ISC”) in the North End of Boston, Massachusetts and needed to upgrade the bases’ facilities to improve energy efficiency level with a trustworthy, tested and qualified “partner.” This highly-secure, mission-critical facility is a multi-building campus comprised of offices, berthing areas for servicemen, boat maintenance facilities including sandblasting and painting operations, and recreational facilities.

Through the ESPC, RWE Clean Energy helped the Coast Guard achieve more energy-efficient heating and cooling of the buildings. The water-cooled centrifugal chillers installed to replace the DX cooling units help to reduce cooling costs by approximately 75%. This installation was done during normal business hours without disturbing the building occupants. Inconsistency in water heating was addressed through the installation of three, more efficient DHW boilers. This project included upgrading lighting fixtures for improved energy efficiency. To centralize the monitoring and control of energy, remote control of all air handling and cooling units was established.



PROJECT DATA

LOCATION

Boston, MA

CONSTRUCTION DATES

Completed on time

CAPITAL COSTS

\$5,755,000

ANNUAL SAVINGS

\$369,661

ENVIRONMENTAL BENEFITS

2,933.49 tons of harmful greenhouse gas emissions reduced annually

Equivalent to:

- Preserving 19.7 acres of forest from deforestation* or
- Conserving 5,627 barrels of oil*

*Sources:

- Leonardo Academy’s Cleaner & GreenerSM Emissions Reduction Calculator: <http://www.cleanerandgreener.org/re-sources/pollutioncalculator.html>
- U.S. Environmental Protection Agency, Greenhouse Gas Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

The Coast Guard’s boat grit-blasting room was retrofitted with updated makeup air systems, exhaust systems, and heating systems to reduce energy use during non-production hours, and increase energy efficiency during grit-blasting and painting operations. The winter-cooling air handlers were upgraded to allow free cooling during winter operations. The compressed air systems were upgraded with improved controls, heat recovery for space heating, better compressed air storage and distribution, and leak repairs.

RWE Clean Energy provided all the energy savings performance contracting services to the USCG ISC under the Department of Energy’s Super-ESPC Contract.

PROJECT HIGHLIGHTS				10-YEAR ACTUAL SAVINGS				
YR	Total Energy Savings (Mbtu/yr)	Electric Energy Savings (kWh/Yr)	Natural Gas Savings (Mbtu/Yr)	Total Energy & Water Cost Savings (\$/Yr)	Other Energy Related O&M Cost Savings (\$/Yr)	Total Cost Savings (\$/Yr)	Guaranteed Cost Savings for Year (\$/Yr)	Excess Savings
0	13,673	1,063,089	10,045	\$198,740	\$0	\$198,740	\$186,570	\$12,170
01	23,971	2,209,233	16,431	\$383,239	\$17,381	\$400,000	\$369,661	\$30,958
02	24,368	2,269,294	16,893	\$399,779	\$17,902	\$417,681	\$376,368	\$41,313
03	24,604	2,259,355	16,893	\$409,990	\$18,440	\$428,430	\$386,425	\$42,005
04	24,640	2,270,002	16,893	\$421,614	\$18,993	\$440,607	\$396,966	\$43,651
05	24,640	2,270,002	16,893	\$431,724	\$19,563	\$451,287	\$409,400	\$41,887
06	24,640	2,270,002	16,893	\$453,402	\$20,150	\$473,552	\$426,636	\$46,916
07	24,640	2,270,002	16,893	\$469,756	\$20,754	\$490,510	\$442,449	\$48,061
08	24,640	2,270,002	16,893	\$486,805	\$21,377	\$508,182	\$457,820	\$50,362
09	24,640	2,270,002	16,893	\$503,261	\$22,018	\$525,279	\$473,210	\$52,069
10	24,640	2,270,002	16,893	\$521,819	\$22,679	\$544,498	\$490,515	\$53,983
TL	\$234,456	\$21,420,983	\$161,620	\$4,158,310	\$176,578	\$4,334,268	\$3,925,505	\$409,392

There are no actual annual savings for electric demand or water.



PROJECT DATA

ENERGY CONSERVATION MEASURES

Lighting Upgrade

- Installed occupancy sensors in offices and common areas
- Converted incandescent exit signs to LED
- Installed T-8 lamps and electronic ballasts

Multi-building Central Chilled Water Cooling System

- Installed a high-efficiency central plant sized for four of the major buildings
- Installed a chilled water distribution system throughout the four buildings

High-efficiency Condensing Domestic Hot Water (DHW) Boilers

- Installed three innovative condensing DHW boilers
- Re-piped the entire DHW system eliminating the need to operate existing large boilers

Energy Management and Control System (ECMS)

- Installed a remote control system for all air handling and cooling units
- Replaced local thermostats with temperature sensors and enable/disable controls

Air Distribution Systems

- Installed new variable air volume dampers and updated controls for improved energy savings

Compressed Air System

Winter-Cooling Air Handling Unit Upgrades