



Naval Station Pearl Harbor 2010 CNO Environmental Awards Sustainability – Non-Industrial Installation

Introduction:

Mission: Naval Station Pearl Harbor (NAVSTA Pearl) enables maximum mission readiness of our tenant commands and activities by providing the highest quality installation services, facilities support and quality of life programs. NAVSTA Pearl is one of the Navy's busiest harbors. NAVSTA Pearl annually completes 65,000 boat runs and transports 2.4 million passengers to and from Ford Island and other harbor locations. Navy-manned USS ARIZONA tour boats transport nearly 2 million visitors to the memorial each year. NAVSTA Pearl also owns and operates one of the Navy's largest recreation and special services programs, has its own police and security force and is responsible for DOD firefighters in 13 stations island-wide.

Location and Acreage: Located within the Hawaiian archipelago on the southern, central, and western portions of the island of Oahu, NAVSTA Pearl occupies more than 14,000 acres of land, on three separate locations. These locations are the main Pearl Harbor Naval Complex (PHNC), The Naval Magazine Pearl Harbor (NAVMAG) Lualualei Branch, and the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMSPAC). The PHNC occupies more than 5,000 acres and is the headquarters of the United States Pacific Fleet. The Complex also includes the waters of Pearl Harbor, and its submerged lands. The NAVMAG Lualualei Branch together with the adjacent NCTAMSPAC Radio Transmitting Facility, occupies almost 9,000 acres of land in Lualualei valley on the western coast of the island of Oahu. This facility houses an impressive array of communications antennas as well as an extensive munitions magazine complex. The main NCTAMSPAC facility occupies more than 700 acres of land in central Oahu. Established in 1940, the NCTAMSPAC site is now the world's largest communications station.

Civilian and Military Population: In FY09, there were more than 6,500 Navy personnel stationed on the island of Oahu. During this same period, there were more than 9,000 civilian personnel employed on the island of Oahu by the Navy and Marine Corps. The DOD is one of the largest employers in the State of Hawaii, and the economic contributions are very significant.



Aerial view of the Bravo Piers at NAVSTA Pearl Harbor during the semi-annual Rim of the Pacific (RIMPAC) Naval Exercises



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Background:

There are many sustainability challenges facing NAVSTA Pearl and the Navy in Hawaii. The most obvious challenge is posed by its geographic isolation. The State of Hawaii is more than 2,000 miles from the continental United States. It is even farther from other bases and installations in the Pacific and Asia. Everything must be imported into the State, either via ship or by air. This adds significantly to the cost of operations in Hawaii. It also severely limits the options and return for off-island recycling and green procurement programs. Despite these challenges, NAVSTA Pearl has established an ambitious sustainability program that will continue to grow in the coming years.

Accomplishments:

With the State's complete dependence on imported oil for energy generation, energy conservation and alternative energy initiatives have taken on added importance. NAVSTA Pearl has developed an impressive alternative energy and resource conservation program that has implemented several key initiatives.

Photovoltaic Initiatives: One of these initiatives is the implementation of several photovoltaic energy generation projects throughout the base. In December of 2009, a \$15M project was awarded for the installation of 2.5MW of solar photovoltaics generation panels on the roofs of five buildings. The new photovoltaic system will produce approximately 3.4GW hours of energy annually which is equal to the annual energy needs of approximately 440 homes. The new PV system will provide an annual avoidance of approximately 5,667 barrels of oil and 3,118 tons of CO2 emissions, which is the equivalent of taking 550 passenger cars off the road.

Another unique renewable effort is a partnership with the Joint DoD community on Oahu to develop a large-scale solar photovoltaic multiple-award contract. By pooling available DoD property on Oahu, all agencies will benefit from lower construction and contract administration costs. One of the NAVSTA Pearl sites for solar photovoltaic development is the historic Ford Island runway. Using this historic site for photovoltaic arrays was coordinated with the State Historic Preservation Office (SHPO) and represents a real win-win for the SHPO and NAVSTA Pearl. The visibility of this historic site will be preserved while returning the use of this property to once again support the Defense Mission.



Photovoltaic project at the NEX Distribution Center



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Air Conditioning (AC) Re-Engineering: Building 1770, a large submarine maintenance facility covering more than 185,000 SF, is more than 15 years old. The original AC system was old and in need of increasing amounts of maintenance. It was determined that it would be much more economical to replace the old AC system with a modern system which would be much more energy efficient. The old central air-cooled chiller system was replaced with two new energy-efficient chillers. The five existing air-handler motors were also replaced with premium efficient motors. For added energy savings, variable frequency drives (VFDs) were installed on the two chilled water pumps and the five air handlers. VFDs modulate the speed of the motor according to the building's air conditioning load, instead of constantly operating at full speed. Total cost savings are estimated at more than \$92,000 annually.



New energy efficient chillers being installed at bldg 1770 on NAVSTA Pearl

Xeriscape Project at Navy Exchange: Fresh water is also a large sustainability concern. This makes xeriscaping especially important. Hawaii is an island in the middle of the ocean, and is completely dependent on rainfall to satisfy its fresh water needs. This project incorporated the planting of hearty, drought-tolerant plants, efficient irrigation, ground cover and balanced soil to produce a landscape that requires 50 percent less water to maintain than traditional landscaping. Over 45,000 plants, ranging from crown of thorn shrubs to dwarf sugar cane, were planted at the Navy Exchange (NEX) facility. Native Hawaiian plants account for eight of the 20 different species used throughout the NEX complex, totaling about 22,000 plants. Their role in xeriscaping is essential to the project, because they are naturally accustomed to Hawaii's temperate climate and unpredictable weather patterns. The Navy will begin to see water savings upwards of 50 percent once the plants have matured, contributing to the Navy-wide push to become environmentally responsible and water efficient.



New Xeriscape Planting at NEX Pearl Harbor



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Facility Energy Audits: Over 4.9M square feet of facilities were audited for energy and water conservation opportunities in FY10, exceeding the mandated goals required under the Energy Independence and Security Act of 2007. Audit results identified over 87 energy & water conservation measures with potential annual savings of \$1,621,628. Audit recommendations are being used to program the next generation of energy and water conservation projects.

Energy Savings Performance Contract (ESPC): An ESPC contract was awarded in 2009. This award will allow for lighting retrofits in 36 facilities and Air Conditioning upgrades in four facilities. This ESPC delivery order has a guaranteed energy savings of \$8,439,000 over the next 15 years.

Cutting Edge Technical Evaluation: NAVSTA Pearl hosted a cutting edge evaluation of more modern and energy efficient parking lot lighting. In this evaluation various fixtures were installed and are being monitored and evaluated on lighting quality, maintenance requirements and energy efficiency. Light Emitting Diode (LED) lighting and Induction lighting are the two primary technologies being compared. Results will affect future exterior lighting retrofit projects.

Energy and Water Conservation Retrofits: Multiple energy and water conservation initiatives were undertaken by NAVSTA Pearl in FY09/10. Projects included lighting retrofits, lighting controls, low-flow plumbing fixture retrofits, AC upgrades, solar window film application and application of “Cool Roofs”. In all projects are projected to save over \$366,000 annually in utility costs.

Arizona Memorial Ferry Boats: In 2009, new USS Arizona Memorial ferry boats were purchased. The new boats were purchased with several Clean Fuel Technology innovations. The twin inboard diesel engines meet the EPA’s Tier 2 standards for total hydrocarbons, nitrogen oxides, carbon monoxide, and particulate matter emissions. The engines are also equipped with a diesel oxidation catalyst which converts hydrocarbons and carbon monoxide into water and carbon dioxide. Finally, the boats are optimized for operation with biodiesel fuel. The boats will initially operate with a 20% biodiesel blend, with the ultimate goal being to operate with 100% biodiesel.



New environmental friendly Arizona Memorial Ferry Boats

Fuel Reclamation: FISC Pearl operates the fuel reclamation program for the Region. The reclamation program reclaims off-specification diesel and jet fuel, and used oil. In FY09, more than 195,000 gallons of fuel was reclaimed. In FY10, this number grew to more than 500,000 gallons. This program contributes to the Navy’s sustainability efforts in two ways. First, it reduces the Navy’s waste oil disposal costs, and second, it creates an additional source of fuel. Through this program, the sale of fuel oil reclaimed vice disposal as oily waste resulted in a savings over two years of almost \$11.7M.



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The waste oil reclamation plant was also modified to be able to discharge wastewater into the base's sewer system. Previously, waste water was required to be treated as an oily bilge waste. This successful initiative effectively increases the Navy's vessel bilge water treatment capacity, and also reduces the disposal cost by more than \$25,000 annually.

Hazardous Materials Substitution: FISC Pearl has operated a Consolidated Hazardous Materials Reutilization and Inventory Management Program (CHRIMP) at NAVSTA Pearl for almost 20 years. Before the implementation of CHRIMP, each work center ordered and stored hazardous materials. Whatever was not immediately used was stored away and often not used again by that work center. The hazardous materials would often have to be disposed of as hazardous waste. Multiplied by many work centers throughout the base, the excess hazardous material purchase costs as well as the waste disposal costs were staggering. CHRIMP created a central hazardous material issue and return point. Partially used hazardous materials were returned to the CHRIMP center and re-issued to other users. Hazardous material storage in the work centers was kept to an absolute minimum, which further reduced the amount of waste generated. The result was a significant reduction in the amount of hazardous materials purchased, as well as waste that was generated. In FY09, CHRIMP avoided waste disposal costs were almost \$690,000, avoided procurement costs were more than \$1.1M, total savings were in excess of \$1.8M. FY10 CHRIMP cost avoidance was even more impressive with avoided waste disposal costs of more than \$1.4M, avoided procurement costs of more than \$1.9M, and total savings in excess of \$3.3M.

Outreach: The State of Hawaii offers a unique opportunity for partnering within the Joint DoD community and with State and City Government. The NAVSTA Pearl is actively involved in multiple working groups with a focus on implementing Sustainable practices:

- Honolulu Clean Cities – This working group is funded under the U.S. Department of Energy's "Clean Cities" program, and seeks to reduce fossil fuel use in the transportation sector. This partnership seeks to support and expand clean transportation initiatives implemented by the City & County of Honolulu onto Naval Installations, and vice versa.
- Joint DoD Partnerships
 - JSWG (Joint Sustainability Working Group) – The JSWG was created to identify sustainability initiatives that can be implemented jointly across the Oahu DoD community. One action of this group was to develop a MOA to consolidate recyclable materials to capitalize on bulk resale value.
 - PACOM Working Groups – NAVSTA Pearl participates in several working groups established and chaired by PACOM. These working groups seek to support the State of Hawaii Clean Energy Initiative and Military Energy Security.



Families enjoying the annual Earth Day/Springfest celebration. Such events are an important part of the outreach to improve public awareness of the Navy sustainability program.



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- On Base Energy Conservation Awareness & Outreach Program: NAVSTA Pearl has established a successful Energy Awareness Program with a variety of components:
 - The Building Energy Monitor (BEM) Program provides grassroots assistance in improving energy consumption and conservation efforts in all NAVSTA Pearl facilities. All facilities are required to have a BEM identified and each BEM attends energy conservation training. The BEMs conduct monthly energy conservation behavioral audits of their facilities for the Command to review. The auditing system is utilized to identify actions needed by facility occupants to reduce energy use.
 - “Take Charge Hawaii” Audit Program. NAVSTA Pearl personnel perform 30 “Take Charge Hawaii” audits per month; selecting facilities at random. The focus of these audits is to enforce compliance with the CNRH Energy & Water Conservation Instructions.
 - Energy Conservation School Outreach Program. Energy conservation training is conducted in schools with a high percentage of Navy dependents. Artwork is chosen from each school to be included in a calendar that is then distributed throughout NAVSTA Pearl to further educate Navy personnel on energy conservation. In FY09 & FY10 the program reached approximately 3,400 students.
 - Energy conservation awareness is a message constantly reinforced in daily operations. The Energy Team is a participant the annual Earth Day event sponsored by MWR. Energy conservation is also promoted in October, during Energy Awareness Month. Housing residents are encouraged to purchase and install Energy saving devices by distribution of an energy conservation flyer to their residence.
 - Regional Energy Awards Program - Regional Energy Award Program recognizes outstanding individuals and teams within the Region who have made significant contributions to the energy conservation program. Awards are given quarterly. Active Duty Military, DoD Civil Service employees, and Military Contract employees are all eligible to receive this award.

Attaining Goals in Executive Order (EO) 13423, Section 2:

- EO 13423 requires a 3% reduction in energy intensity per year, with a cumulative reduction in Energy intensity of 30% by FY15 relative to a 2003 baseline. In 2009 NRH reduced energy intensity achieving a total reduction of 15% below the 2003 baseline, exceeding the E.O. goal by 3%.
- EO 13423 requires the development of new Renewable Energy resources to the maximum extent possible. In 2009, two solar photovoltaic projects were awarded. The two projects are valued at \$15.2M and will generate 2.5MW of renewable energy.
- Green Procurement: Supply corps and credit card purchasers are trained on the requirement to purchase the most energy efficient model if the product is listed on the DOE FEMP or EPA Energy Star websites. Justification is needed for purchasing an alternative product. The Region energy instruction requires the use of Energy Star appliances in the work place.