

**Fiscal Year 2011 Office of the Under Secretary of Defense Environmental Awards
Sustainability – Industrial Installation
Defense Logistics Agency
Defense Supply Center Richmond**

Introduction

Defense Supply Center Richmond, located in central Virginia along the I-95 corridor in Chesterfield County, Virginia, has been a consistent, dependable supplier of quality goods and services to those defending freedom around the world since it was activated in 1942.

Designated as the aviation demand and supply chain management team within the Defense Logistics Agency (DLA), the Center serves within the Department of Defense (DoD) supply chain as the primary source of supply for nearly 1.3 million repair parts and operating supply items. More than 444,000 of the items we manage are aviation parts, including spares for engines on fighters, bombers, cargo aircraft and helicopters; aircraft and helicopters; airframe and landing gear parts; flight safety equipment; and propeller systems. Defense Supply Center Richmond's core mission is to supply products with a direct application to aviation. These items support over 1,300 major weapons systems utilized throughout the DoD.

With over 600 acres and approximately 120 warehousing, utility and administrative buildings that total over 6.7 million square feet, Defense Supply Center Richmond is host for a number of other DoD, Federal and state organizations. The largest of these tenants are the 350-acre DLA Distribution Richmond Virginia, DLA Distribution Mapping; the Virginia Army National Guard Vehicle Maintenance Shop. The Center and its tenant activities employ nearly 3,000 civilians, service members, and contractor personnel, whose mission is to provide critical material support across the DoD and other Federal agencies.

Background

The Defense Supply Center Richmond has maintained an International Organization for Standardization 14001 externally registered Environmental Management System (EMS) since 2005. This system serves as the foundation of the installation's overall sustainability program. The Installation's mature ISO 14001 registered environmental management system and its inherent sustainability program, incorporate sustainable practices within its ongoing and long term objectives and targets to reduce energy and water consumption, to reduce the generation and disposal of solid waste and to purchase and utilize environmentally friendly products. Our primary goal is to minimize any detrimental effects our daily actions may have on the environment. Concurrent with this action are our efforts to pursue whatever initiatives possible to improve our environment today and to ensure that those improvements have a lasting and sustainable impact into the future. Our EMS allows us to effectively focus our efforts on the installation, the environment, environmental stewardship, our neighbors, and aggressively pursuing the initiatives contained within Executive Order 13514.



Program Summary

Key to the success of our environmental management system and its sustainable initiatives, is employee awareness and employee involvement across the installation. This is from both the installation perspective as well as from our mission activities. Our recycling program encourages all of our employees to recycle. Recycling has just become a way of doing business. Our long term vision and plan to reduce our drain on the existing energy grid lead us to successfully pursue numerous energy related sustainable initiatives. The long term planning capabilities of our environmental management system has also allowed us to make tremendous strides within our Green Procurement Program, and our initiative to purchase and use environmentally friendly products across the installation.

The foundation of our sustainability program is clearly the installation's environmental management system. This program allows us to easily identify environmental challenges to the installation, develop objectives and targets to meet those challenges, and easily monitor our progress until successful completion. As one objective and target is met, another new challenge is added to the list. The eight year old maturity of our environmental management system, and its acceptance and buy-in by installation employees, ensures that this concern for the sustainability of our environment is part of our everyday culture. This is as equally true for the mission side of the house as it is for those individuals who manage the infrastructure of the installation.

Program Accomplishments

During the past year, the objectives within our Environmental Management System focused on four primary sustainability goals: recycling and solid waste diversion; innovative energy saving initiatives; water usage reductions, and green procurement. In FY 2011, the installation demolished 10 large wooden and brick storage warehouses. The combined square footage of the buildings demolished was 1,663,040. Our primary focus with these demolitions was to minimize any impact to the environment, either from the actual demolition operations or from any needed disposition of the material. During this reporting period, sustainable practices implemented within our demolition program diverted 105,251 tons of construction debris from the landfill. From these efforts, we recycled 1,104 tons of steel; 782 tons of steel panels and wooden beams; and 103,365 tons of concrete/asphalt/brick. Much of this aggregate was recycled on site through the use of an environmentally permitted rock crusher. The stone material was then reused on the installation as beneficial fill. Our recycling and waste diversion efforts resulted in a cost avoidance of \$2,692,830 in landfill fees. Less than 16,000 tons of debris was hauled to the landfill for disposal. Our solid waste recycle program diverted 1,633 tons of recycled material; 512 tons of office paper, mixed paper, and cardboard; 21 tons of batteries; 2 tons of plastic and aluminum; 47 tons of pallets; 2 tons of crush bulbs; 1 ton of rechargeable batteries; 899 tons of electronics; 1 ton of white goods; 2 tons of brass; 8 tons of tires; 102 tons of paper maps; 4 tons of canvas; 32 tons ceiling tiles and 0.5 ton of toner



Figure 1: Warehouse undergoing demolition.



Figure 2: Demolished warehouse wooden beams segregated for recycling.

cartridges. Our disposed tonnage was 879 with a population of 3100 our diversion rate was 65percent. Our diversion of solid waste resulted in a cost avoidance of \$224,155 in landfill fees.

During FY 2011, the Defense Supply Center Richmond and its EMS had several energy initiatives designed to help meet the aggressive goals found within Executive Order 13514, “Federal Leadership in Environmental Energy, and Economic Performance.” First and foremost, a computerized Energy Management Control System was installed. This system electronically links and monitors electric usage meters on each building on the Defense Supply Center Richmond as well as fuel usage meters on each boiler and large scale emergency power generator. Such a system allows us to monitor our energy usage across the installation, focus on improving energy efficiencies, and transfer effective energy saving initiatives.

Ground source heat pumps are among the most energy efficient technologies for providing heating and air conditioning. Unlike an air-source heat pump that transfers heat to or



Figure 3: Workers install wells utilized by energy efficient ground source heat pumps.

from the outside air, a ground source heat pump exchanges heat with the ground. The ground-based pumps use approximately 50 percent less electricity than a comparable air source heat pump. Using this simple reasoning, the Defense Supply Center Richmond has installed six ground source heat pumps to heat and cool three of its buildings. Each ground source heat pump required the drilling of 6 to 11 supporting wells. The typical depth of each of these wells was 500 feet. Because the life expectancy of the mechanical parts of a ground source heat pump is 25 years and the energy coil lasts over 50 years, the installation expects the energy savings to pay for the pumps installation and operation in less than ten years based on the life expectancy.

The Defense Supply Center Richmond is also taking advantage of the sun to help reduce its energy needs. Early in the fiscal year, a 12-kilowatt photovoltaic array was installed on one of our smaller buildings. The power generated from this array was tied directly to the installation’s power grid and off-sets the cost of powering the building. Based on the success of this first attempt at beneficially harnessing the sun’s power, a thermal solar water heating system was installed over the installation’s Fitness Center. Here, the photovoltaic array continuously heats 476 gallons of water stored in two large tanks. It is estimated that the Fitness Center uses nearly 1,000 gallons of hot water daily. The use of the solar water heating system saves the installation 125 KW per day.



Figure 4: Workers install photovoltaic array on top of building.

Another passive means of saving energy at the Defense Supply Center Richmond involved innovative roof repairs. During this past year, six large office buildings required repairs to the roofs. The combined total area needing repair was in excess of 1,720,000 square feet. Rather than installing the typical dark colored roof, the installation decided to pursue what is known as cool roof technology for each of the three buildings.



Figure 5: Energy saving cool roofs.

The cool roofs, which are white in color, reflect the sun's energy from the roof surface. In fact, the white roofs installed at the Defense Supply Center Richmond reflect nearly 80 percent of the incoming solar energy. This allows the building below to stay cooler, which saves on energy costs, especially in the warm summer months. It is estimated that the installation of the white cool roofs will save the Defense Supply Center Richmond 1,365 megawatts of energy a year, which equates to a yearly energy savings of \$79,000.

During FY 2011, the installation also pursued various lighting initiatives intended to reduce energy usage across its 600 acres. A design/build parking lot and pedestrian lighting project replaced 320 inadequate metal halide street lighting fixtures with energy efficient Light Emitting Diode (LED) fixtures. It is estimated this project will save the installation approximately \$60,826 per year with a payback period of approximately 11 years. Defense Supply Center Richmond also executed projects that replaced more than 1,000 inefficient lights located throughout the numerous storage warehouses. This action alone permanently reduced the installation's electrical energy use by 4.8 percent.

As a combined result of its energy saving initiatives, the Defense Supply Center Richmond reduced its overall energy consumption by 9.7 percent in FY 2011 (38,943 MWH) as compared to FY 2010 (43,086 MWH). These accomplishments saved the installation \$193,000 in energy costs.

In further pursuit of Executive Order 13514, during FY 2011 the Defense Supply Center Richmond and its EMS made significant progress toward reducing water consumption across the installation. The first major project involved a complete renovation and replacement of our internal water distribution system. This project eliminated the need to maintain two elevated steel water storage tanks and to periodically flush the water lines to maintain water quality. All cast-iron water mains were replaced and recycled and the soundness of the brand new equipment allowed for the use of high efficiency variable speed drives and energy efficient fire pumps. This project alone will save the installation 30 percent in its overall water usage. As a baseline, in FY 2010, the Defense Supply Center Richmond consumed 44,926,326 gallons of water at a cost of \$60,062. The installation also worked to reduce its overall water discharge by two thirds by relining and repairing its sanitary and stormwater sewer system. In FY 2010 using a meter external to the installation, the Defense Supply Center Richmond averaged 255,546 gallons of sewer discharge per day. As a result of the repairs, the sewer discharge decreased to 84,719 gallons per day (67 % decrease) with a subsequent monetary savings of \$50,000 per year in sewer charges.



Figure 5: Workers replace water distribution system

During FY 2011, the Defense Supply Center Richmond also significantly invested in the improvement of its Green Procurement Program. This included increasing the awareness of the program by the employees of the installation and also working to ensure its effective integration between all involved offices. A detailed informational brochure was developed that clearly explained the need for following the rules of the Green Procurement Program; the availability of beneficial resources; and the benefits to the environment, the installation's mission, and enabling the warfighter to buying green. This brochure was electronically distributed to the installation's 2,500 employees and is available on line. Next, on-line green procurement training modules

were developed that easily educate acquisition, requisition, and installation support personnel on the importance of initiating green procurement actions in the initial stage of their procurement actions. Lastly, a list of the environmental and safety Federal Acquisition Regulation clauses required for all contract actions was provided to DLA's Contracting Support at Richmond. The inclusion of these clauses will ensure that any contractors working on behalf of the installation are fully aware of their need to protect the environment and to comply with all applicable environmental regulations, to include buying and utilizing green products whenever possible. Contractor adherence to these clauses will be verified by installation Environmental Branch personnel throughout the duration of the contract.

Judging Criteria

Program Management. During FY 2011, the Defense Supply Center Richmond and its EMS showed tremendous initiative and concern for the environment by implementing numerous successful waste, energy, and water reduction programs across the installation. Efforts were also made to substantially strengthen the coordination and effectiveness of the installation's Green Procurement Program and its benefit to the environment. This effective environmental program management through our EMS not only supported the obtainment of the sustainability goals of Executive Order 13514 and their benefit to the environment, it allowed the employees and leaders to focus their mission efforts toward meeting the needs of the warfighter.

Technical Merit. The Defense Supply Center Richmond successfully implemented cost effective and innovative waste, water, and energy reduction techniques. All of these helped improve the environment and allowed the installation to focus on meeting the needs of the warfighter. This will continue well into the future. Also, our successful efforts with our Green Procurement Program will have a lasting effect upon the environment, as it promotes the efficient and sustainable use of recycled/recyclable products by all installation personnel. These environmental improvement initiatives also effectively addressed environmental aspects considered significant by our EMS.

Orientation to Mission. The effectiveness of the initiatives being implemented during FY 2011 has resulted in several thousands of dollars in waste, water, and energy reduction monetary savings. These initiatives are in continual full compliance with all applicable Commonwealth of Virginia and Federal environmental regulations. Also, these monetary savings are generated across the entire workings of the installation. These savings not only reduced the financial impact and allowed the employees of the Defense Supply Center Richmond to focus on effectively meeting their mission of supporting the needs of the warfighter.

Transferability. The simplicity of these effective waste, water, and energy savings, and the ease of their sustainment, facilitates their continued use long into the future. This includes the effectiveness of our Green Procurement Program. The broadness of the remedies implemented on the Defense Supply Center Richmond also allows for their adoption by other DoD facilities.

The Defense Supply Center Richmond utilizes the stakeholder outreach capabilities of its EMS's external partnership known as the Virginia Regional Environmental Management System

(V-REMS) as a means for promoting and potentially transferring these innovations to others outside of this installation. This one of a kind partnership, which is chaired by the installation, is comprised of more than eighty-five public and private organizations that routinely communicate and meet to address the environmental needs of its members and of the Commonwealth of Virginia. All DoD facilities within the Commonwealth are members of this partnership. Defense Supply Center Richmond routinely updates this two-way partnership regarding the development, success, and potential transferability of our waste, energy, and water reduction initiatives.

Stakeholder Interaction. In addition to V-REMS, the Defense Supply Center Richmond utilizes its EMS Working Group to educate, solicit, consider, and act upon the sustainability concerns of its stakeholders. While V-REMS focuses on the installation's external stakeholders, such as the community, state and local regulators and non-governmental organizations, the EMS Working Group, which meets at least quarterly, focuses on the sustainability needs and concerns of those activities on the installation. The combination of both groups allows for effective stakeholder interaction regarding the environmental initiatives of our EMS.