

## 2015 Secretary of Defense Environmental Award Sustainability – Industrial Installation

### 1.0 Introduction

Established in 1919 on Naval Base Coronado (NBC), California, Fleet Readiness Center Southwest (FRCSW) is an integrated team of civilian and military personnel working together to provide comprehensive aviation rework for the U.S. Navy. The unique mission is to enable fleet readiness through timely and responsive manufacturing, maintenance, and repair of naval aircraft, associated components, and marine gas turbine engines. In FY 2015 FRCSW delivered 164 aircraft for the F/A-18 Hornet, AV-8 Harrier, E-2 Hawkeye, C-2 Greyhound, H-60 Seahawk, CH-53 Super Stallion, and F-35 Lightning II product lines as well as 38,500 aircraft components, 99 aircraft engines, and 22 marine gas turbine engines.



FRCSW employs approximately 4,300 personnel consisting of 2,700 civilians, 1,000 military, and 650 contractors, and is the largest of 32 tenant commands located at NBC. The facility occupies 81 buildings, housing 2.2 million square feet of industrial facilities.

### 2.0 Background

FRCSW operates in one of the most stringently environmentally regulated areas of the United States. The city of Coronado is an affluent retirement and resort community with residents who have the time, resources, and knowledge to be involved with community issues. The key regulatory agencies providing oversight are the San Diego Air Pollution Control District, San Diego Hazardous Materials Division of the Health Department, San Diego Industrial Wastewater Division, Region 9 of the Environmental Protection Agency, California Department of Toxic Substance Control, California Air Resources Board, and the Regional Water Quality Control Board. In addition to strict environmental regulatory compliance requirements, FRCSW operates a multitude of major industrial processes in a variety of applications such as painting, abrasive blasting, chemical stripping, electroplating, chemical cleaning and degreasing, jet engine testing, machining, non-destructive inspections, composite repair, heat treating, and foundry operations. Additionally, hundreds of secondary industrial processes require the use of hazardous materials and generating a variety of wastes, all of which require compliance with air, water, and waste regulatory requirements. FRCSW works diligently to address local community and federal regulatory concerns by sustaining a fully staffed Environmental Program Office (EPO), with essential multi-media professionals and conformance programs. The EPO utilizes an ISO 14001 Environmental Management System (EMS) used to continually improve sustainability performance in support of the FRCSW mission working in conjunction with an ISO 9001 quality program.



### 2.1 Sustainability Program

#### *Environmental Program Office*

The FRCSW EPO is staffed with personnel who possess the necessary regulatory compliance knowledge and technical skills to integrate the strategic sustainability performance goals into the FRCSW structure. The office's primary objective is to sustain a proactive environmental program and ensure compliance with applicable Federal, State, and Local environmental laws and regulations, and conformance to Executive Orders 13423 and 13514.

The EPO consists of environmental engineers, environmental protection specialists, hazardous material and waste handlers, Integrated Product Team (IPT) leads, and Competency Supervisors. The EPO supports six major programs: Hazardous Waste & Materials, Air Quality, Environmental Management System (EMS), Energy/Water Conservation, Pollution Prevention, and Recycling.

**EPO Sustainability Performance Goals and Mission Alignment**

The EPO aligns and integrates with existing FRCSW structure and mission to “close the loop” in providing continual improvement for sustainability performance as follows:

- Ensure sustainability performance is integrated into the budget process.
- Develop media plans, projects, and in-house inspection guidelines to sustain and continually improve sustainability performance to satisfy organizational goals.
- Inspect all industrial buildings weekly and interface with production shops and internal customers for sustainability performance.
- Train production shop environmental representatives to provide procedural feedback to continually improve sustainability performance.
- Combine efforts with the FRCSW AS 9100/AS 9110 Quality Management System program to ensure quality MIL-SPEC standards are sustained for the unique FRCSW mission.
- Maintain a strong working relationship with the FRCSW Safety office to allow for two-way communication, providing truly effective safety and health program compliance and sustainability.

**EPO Media Programs**

The EPO media programs integrate with the ISO 14001 EMS program by identifying deficiencies within the EPO compliance systems. Table 1 shows how EPO media programs are linked to the ISO 14001 EMS program and overall goals are designed to provide cost effective operational controls for sustainability performance.

**Table 1 – EPO Media Programs, Drivers, Significant Aspect Criteria, Goals and Operational Controls**

ISO 14001 Environmental Management System				
EPO Media Programs	Drivers	Significant Aspect Criteria	Overall Goal	Operational Controls
ISO 14001 EMS	Executive Orders	Conformance to ISO Standard	Zero Non-conformances	ISO 14001 EMS Requirements, Media Program Plans, Permit Conditions, Internal Inspections with Check List, Customer (Shop) Feedback from Representatives, Environmental Training Bulletins, Environmental Compliance Team (ECT), Environmental Improvement Team (EIT), Energy Management Team (EMT; includes water and greenhouse gas management), Spill Response Team (SPT), Chemical Product Hazardous Authorized Users List (HAUL), Environmental Compliance and Conformance Review for Plant Facility and Industrial Processes via Command Technical Directives (TDs) identifying change, Hazardous Materials Management Systems (HMMS) and MSDS Requirements, Safety Office Hazard Communication Plan.
Air Quality	Title V Permit; State via County Local Permits	Compliance	Zero NOV	
Hazardous Materials	Health Permits	Compliance	Zero Non-conformances	
Hazardous Waste	Health Permits	Compliance	Zero NOV	
Storm Water	NPDES Permits	Compliance	Zero NOV	
SPCC and Storage Tanks	Health Permits	Compliance	Zero NOV	
Site Remediation	Special Permit(s)	Compliance	Zero NOV	
Pollution Prevention	Health Permits, Executive Orders	Compliance and Conformance	Source Reduction; Waste Prevention	
Recycling	Executive Orders	Conformance	Solid Waste; Surplus Electronics	
Energy and Water (Utility) Conservation	Executive Orders	Conformance	Efficiency; Renewable Energy	

Operational controls based on media plans compatible with industrial operations necessary for the FRCSW mission are deployed through a variety of mechanisms to ensure performance is sustained and improved upon annually. For example, all organizations within each IPT receive annual environmental bulletin training along with roster sign out forms which enables compliance and conformity to the performance goals of Executive Orders. The key factors for operational controls within the IPT are simplicity and regular communication.



### ***ISO 14001 EMS Continual Improvements***

Continuous Improvement for sustainability performance is planned annually for short and long term goals using the precepts of ISO 14001 EMS: Plan, Do, Check, and Act. The entire process is prefaced with an environmental and safety integrated policy signed by the FRCSW Commanding Officer and posted in all functional IPT work spaces throughout the organization. The policy includes our sustainability performance goals.

The planning step involves the treatment of all functional areas within the IPT. Each IPT has an AIRSpeed manager trained in continual improvement methods such as Lean Manufacturing, Six Sigma, and Theory of Constraints in order to identify ways to improve the industrial processes. The EPO media program managers meet with the IPT AIRSpeed managers to share ideas with the purpose of exceeding established goals and metrics. From this, documented project plans are developed and tracked and the approved plans are entered into the ECAM system to manage the project with schedule and milestones. These efforts improve the significant aspect criteria for the environmental media programs for sustainability performance.



AIRSpeed Continual Improvement Suggestion Board located in production areas

The ISO 14001 EMS program includes an internal audit component that monitors the EMS program to measure and support the continual improvement to achieve sustainability performance goals. Additionally, the EMS program includes a checklist to measure sustainability performance for the IPT. Each IPT is reviewed against the checklist for past inspection findings, root cause solutions, updates of the IPT environmental impacts, significant aspects using the significant aspect criteria, and updates to the IPT projects for compliance and performance goal sustainability. The EMS team shares solutions across the IPT to enhance achieving sustainability goals. Further, noncompliance IPT performance is documented within ECAM for traceability and corrective action recording.

Senior management reviews the performance and status of the EMS several times annually, contributes to the goals for continual improvement, and ensures budgets and funding are available for approved projects.

### ***Project Selection Sustainability Report Card***

FRCSW developed distinct teams to provide feedback for any FRCSW project in order to determine sustainability performance as follows:

- EMS Team – Conformance to ISO 14001 EMS Standards.
- Environmental Compliance Teams – Media Compliance Programs.
- Environmental Improvement Team – Pollution Prevention through source reduction and waste prevention, *green* procurement, ozone depleting substances and recycling.
- Energy Management Team – Includes energy, water and *greenhouse* gas footprint.
- Spill Response Team – Prevention, control, and management of releases to the environment.

All projects submitted by the IPT as part of the FRCSW continual improvement program (*AIRSpeed*) are reviewed by FRCSW IPT representatives and the EPO. The relevant teams develop life cycle analysis information for sustainability performance and score the project. If a project does not comply with the environmental regulations it is modified or cancelled.

### **Organization Sustainability Report Card**

The EPO has adapted the *balanced scorecard* approach and created an organization sustainability report card (Table 2 below) to improve sustainability performance within the EPO media programs, economic performance/quality, and community/stakeholder relationships. The report card addresses and tracks goals, metrics, and results.

**Table 2 – Organization Sustainability Report Card**

Sustainability Performance	Organization Objective (Goal)	Organization Target (Metric)	Organization FY 2015 Results
EPO Media Programs	<ol style="list-style-type: none"> <li>1. Zero Notices of Violation (NOV)</li> <li>2. Conformance to ISO 14001</li> <li>3. Meet or exceed EO conformance Sustainability Performance Goals.</li> </ol>	<ol style="list-style-type: none"> <li>1. Zero NOV for all EPO Media Compliance Programs?</li> <li>2. No major non-conformances for ISO 14001 EMS Standard?</li> <li>3. Met or exceed E.O. 13514 and E.O. 13423 applicable SSPP Goals in FY 2015 using Life Cycle Assessment (LCA)?</li> </ol>	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. Yes</li> <li>3. Yes. Renewable energy use needs attention for FY 2020 target – see accomplishment section for specifics.</li> </ol>
Economic Performance	<ol style="list-style-type: none"> <li>1. Reduce Operational Costs</li> <li>2. Execute environmental Program with negotiated budget</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce costs 5%</li> <li>2. Within + or – 5%?</li> </ol>	<ol style="list-style-type: none"> <li>1. FY15 costs were 10% lower than FY 14.</li> <li>2. Budget executed within 5%</li> </ol>
Community and Stakeholder Relations (i.e. on base and surrounding local area)	<ol style="list-style-type: none"> <li>1. Perform Health Risk Assessment (HRA) from Industrial Operations</li> <li>2. Community Involvement</li> </ol>	<ol style="list-style-type: none"> <li>1. Air Program Health Risk Assessment meets regulatory health requirements</li> <li>2. Earth Day Participant</li> </ol>	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. Yes – the EPO staff Earth Day; other community events</li> </ol>

### **Community Outreach and Stakeholder Relations**

FRCSW has a long tradition of supporting numerous community organizations and local groups. Continuing in that tradition we have participated in the following activities:

- Math Engineering and Science Achievement Program sponsoring underrepresented students to participate in school math and science programs.
- Sponsor engineering student interns and participate in shadow day where students spend an entire day with an engineer.
- San Diego Regional Sustainability Partnership that include professionals from city, state, and federal agencies as well as regional business, industry, and non-profits, citing goals (objectives) and metrics (targets) for sustainability performance within the region.
- Restoration Advisory Board consisting of concerned San Diego citizens with remediation projects at San Diego area military bases. FRCSW fosters community support for these projects.
- The Annual Coronado Flower Show venue is sponsored by FRCSW where the EPO shares and discusses successes in sustainability performance.

- FRCSW sponsors an EPO booth at the annual Earth Day fair held in Balboa Park, which draws over 50,000 visitors. The FRCSW booth communicates the command's sustainability performance successes directly to the public.
- Industrial Environmental Association is a group of environmental professionals representing all the key industrial activities in San Diego County. FRCSW EPO participates to share sustainability performance solutions regularly and attends the annual conference to participate and conduct training.



2015 Earth Day at Balboa Park

## 2.0 Summary of Accomplishments

### 2.1 Executive Orders (EO) 13514 and 13423 Strategic Sustainability Performance Plan (SSPP) Accomplishments

In FY 2015, the EPO successfully conformed to the ISO 14001 EMS standard, sustained compliance for all relevant media programs, and satisfied all EO 13514 and 13423 relevant SSPP goals for 2015. NBC handles SSPP goals such as pest management, facility modification, construction, and recycling. The applicable SSPP targets and results for FY 2015 are listed in Table 3.

#### *Example Completed Projects during FY 15 Period of Performance*

**ISO 14001 EMS:** FRCSW achieved zero non-conformances for the ISO 14001 EMS, which resulted in 100% environmental regulatory compliance for all media programs, and met or exceeded all applicable Executive Order 13514 and 13423 SSPP objectives and targets (see Table 3).

**Air Quality Management:** The combination of training and database recordkeeping allowed the Air Management Program to achieve zero Notices of Violation in FY 2015. To this end, the team successfully permitted several pieces of equipment, such as two Plastic Media Blasters (PMBs), which serve to further minimize FRCSW's reliance on the toxic chemical, Methylene Chloride, as a paint stripper. The team is currently working on permitting several projects that include a paint booth, grinding booth, PMB bay, and two metal spray booths all of which will save hundreds of man-hours, increase operational capabilities, and reduce emissions of certain pollutants by up to 99.97%.

**Energy and Greenhouse Gas Management:** Projects included nighttime set-back foundry lead pot, removal of a data center, sequencing air handlers with nighttime, and weekend setback of temperature. The results show electricity savings of 824 Mega-watt-hours, natural gas savings of 1,605 MMBTU, greenhouse gas reduction of 885,111 pounds, and a cost savings of \$922,637. A \$24 million dollar contract was awarded for future projects.

**Water Conservation Management:** Industrial water use (based on industrial waste water generation) decreased 1.8 million gallons in FY 15 from the prior year. This reduction is due to improved metering, and the on-going effort working with the shop representatives to train the artisans in the proper use of industrial water use throughout the facility.

**Pollution Prevention Management:** Source reduction through greener chemical products include expanding the use of non-chromate primers (MIL-PRF-23377 part A and B, green high performance corrosion inhibiting compound) to the entire E2/C2 aircraft and component product lines. This eliminated a major toxic chemical and prevented chromate contamination of personnel protective equipment (coveralls, respirators, etc.) and primer application supplies (paint rags, filters, etc.). Several years



of successful testing of non-chromate primers at FRCSW on E2/C2 aircraft gained approval for use in FY 15. Testing has also begun this year for F/A-18 aircraft and other aircraft systems.

**Hazardous Materials and Waste Management:** FRCSW utilizes a centralized hazardous materials management building to better manage accountability for the distribution of materials to designated industrial building Issue Centers. Spent materials are stored in designated hazardous waste accumulation stations near the Issue Centers and transferred to the hazardous waste storage yard. This streamlined approach continued to reduce hazardous waste generation by over 100,000 pounds per year.



Standard cardboard tri-wall boxes are used to transport surplus electronics

**Recycling Management:** Waste prevention is practiced by recycling all feasible waste streams. The recycling program processed 75% of non-hazardous solid waste (metals, cardboard, and paper) and 100% of surplus electronics. Examples of hazardous waste recycling include spent oil and petroleum products totaling 109,000 pounds and machine coolant totaling 18,000 pounds.



**Green Buildings and Storm Water Releases:** FRCSW's newest hangar, building 325, was built with sustainability and conservation as guiding principles. It includes pollution prevention features such as a spill catch trench leading to catch basin which diverts potential spill releases away from storm drains leading to the bay.

**Table 3 – FY 2015 EO 13514 and 13423 Sustainability Performance Goals and Targets**

Applicable SSPP Goals for FRCSW		
Goals	Energy Intensity	Renewable Energy
ENERGY MANAGEMENT – "Reduce Fossil Fuel Based Energy Consumption"	Target: Reduce Energy Intensity Use 30% by FY 15 from FY 2003 Result: 34.6% Reduction by FY 2015	Target: Produce or Procure 18% Energy Renewable Sources by 2020 Result: 1% achieved by FY 2015 by Energy Produced On-site Renewable Solar Note: A \$24 million funding award was assigned to address energy issues to meet goals
WATER MANAGEMENT - "Reduce Water Use"	Potable Water	Industrial and Irrigation Water
	Target: Reduce Use 26% by FY 2020 from FY 2007 Result: 28% reduction by FY 2015	Target: Reduce use by 20% FY 2020 from FY 2010 Result: 20% reduction by FY 2015
GREENHOUSE GAS (GHG) MANAGEMENT – "Reduce GHG Footprint"	Scope 1 and 2 Sources	Scope 3 Sources
	Target: Reduce 34% by FY 2020 from FY 2008 Result: 32.2% Reduction by FY 2015 on track for the FY 2020 target	Target: Reduce 13.5% by FY 2020 from FY 2008 Result: 25% reduction by FY 2015 from FY 2008 baseline
SOLID WASTE MANAGEMENT – "Increase Recycling"	Reduce Paper Use for Printing	Non-Hazardous Solid Waste Recycling
	Target: Implement EO Paper Policies by FY 14 Result: Polices Implemented (e.g. duplex printing etc.)	Target: Recycle 50% by FY 2015 through FY 2020 Result: 75% Recycled in FY 2015 continue through FY 2020
POLLUTION PREVENTION – "Source Reduction Reduce Chemicals of Concern Use and Release"	Reduce Toxic Chemicals of Concern (i.e. hex-chrome, methylene chloride and cadmium)	Electronic Product Disposal
	Target: Reduce 15% by FY 2020 from CY 2006 Result: Reduced 10% by FY 2015 from CY 2006 on track with target.	Target: Recycle 100% Result: 100% Recycled in FY 2015 Since FY 2009

## 2.2 FY 2015 Sustainability Performance Projects

**Table 4 – FY 2015 Sustainability Performance Projects**

FY 2015 Sustainability Performance Projects				
Project Description	FY 2015 Projects	Sustainability Performance Report Card Accomplishments		
		EPO Media Programs (Result)	Economics (Cost Savings)	Community Stakeholders (Benefits)
Environmental Compliance – Target: No Notices of Violation (NOV) FY 2015	Complete	No NOVs in all Compliance Media Programs FY 2015	Sustainability Investment	Healthier and Safer Environment
FRCSW ISO 14001 EMS Standard – Target: No Non-conformances FY 2015	Complete	Continuous Improvement and Conformance Achieved for FY 2015	Sustainability Investment	Healthier and Safer Environment
Community Outreach – Target: Continue Outreach FY 2015	Complete	Community Outreach Complete for Reporting Year FY 2015	Sustainability Investment	Healthier and Safer Environment
Green Procurement – Target: 95% all office supplies	Complete	All office supply procurement green where feasible – example Office Paper Min 30% Recycle Content	Sustainability Investment	Healthier and Safer Environment
Energy Efficiency - Target: Setback Energy Lead Pot at Night Time	Complete	Annual 562 MMBTU Reduced	Annual \$7,334	Energy Security
Energy Efficiency - Target: Computer Data Center Removal	Complete	Annual 11,390 MMBTU Reduced	Annual \$110,740	Energy Security
Energy Efficiency - Target: Sequencing Air Handling Systems , Secure Steam Lines	Complete	Annual 11,390 MMBTU Reduced	Annual \$666,315	Energy Security
Energy Efficiency - Target: Sequencing Air Handlers, Secure Steam Lines	Complete	Annual 33 Mega Watt Hours Reduced	Annual \$4,620	Energy Security
Energy Efficiency – Target: Paint Complex Set Point Adjustments	Complete	Annual 1,572 MMBTU Reduced	Annual \$86,742	Energy Security
Potable and Industrial Water – Target: Ensure all Shops practice water conservation principles.	Complete	Utility Shop Representative Training to Secure Water Savings (e.g. fix leaks, turn off)	Annual \$5000	Water Security
Scope 1 and 2 GHG – Target: Energy Efficiency Projects Above	Complete	Annual 885,511 lbs CO2 Reduced	Energy Efficiency	Healthier and Safer Environment
Scope 3 GHG – Target: GHG emissions reductions from Scope 3 Air Quality Team	Complete	From FY 2008 to FY 2015 Reduced 11,000 metric tons of CO2 from Air Quality Compliance Investments	Sustainability Investment	Healthier and Safer Environment
P2 Chemical of Concern - Additional Chrome Precise Plate Conform Anodes	Complete	Reduced Chemical of Concern Hex-Chrome Emissions 5%	Annual \$15,000	Healthier and Safer Environment
P2 Chemical of Concern – Target: Replace Hex-chrome Metal Prep and Primer Coating with Less Hazardous Coating	Complete	Eliminated Chemical of Concern Hex-Chrome	Annual \$10,000	Healthier and Safer Environment
P2 Chemical of Concern – Target: Petroleum Products During Transfer	Complete	Annual Bulletin Training to Secure All Storm Drains to Eliminate Releases	Annual \$5000	Healthier and Safer Environment
P2 Chemical of Concern – Target: Paint Stripper Methylene Chloride	On-going	Eliminated Methylene Chloride Use E2-C2 Rotor Dome	Annual \$20,000	Healthier and Safer Environment
P2 Ozone Depleting Substances	On-going	Continue Use of Substitutes Eliminating Non-mission Critical	Annual \$3,000	Healthier and Safer Environment
Recycling Electronics – Target: 100% Electronics Surplus	Complete	100% of all surplus electronics are recycled	Annual \$10,000	Resource Security
Recycling Hazardous Waste – Target: 100% Feasible Waste Streams	Complete	100% of all spent oil, solvent, machine coolant and paint stripper	Annual \$8,000	Resource Security
Solid Waste – Target: All Printers at FRCSW Print Double Sided	On-going	Reduction of office paper use 50%	Annual \$3,000	Resource Security
Solid Waste – Target: Recycle All Non-hazardous solid Waste 75%	Complete	75% of all metal, cardboard and paper recycled in FY 2015	Annual \$15,000	Resource Security



Fleet Readiness Center Southwest Command LOGO

FRCSW\_Command\_LOGO.jpg



The F/A-18 assembly/disassembly Hangar was repainted with non-toxic paint to sustain health and safety compliance. Also, the newly painted facility improves natural lighting, therefore reducing electricity consumption.

F-18\_Aircraft\_Hanger.jpg



The Energy Management Control systems used in FRCSW Industrial buildings reduce energy consumption and greenhouse gas generation. For example, the control system turns heating on and off for day and evening usage.

Energy\_Mgmt\_Controls.jpg



Electric cart with a solar photovoltaic battery charger used to reduce the fossil fuel and greenhouse gas emission footprint.

Solar\_Electric\_Club\_Car.jpg



All surplus electronics are recycled using standard Tri-Wall cardboard boxes.

Surplus\_Electronics.jpg



Metal recycling bins are used for Surplus Metals Recycling. Bins are labeled and controlled to ensure the proper recyclables are captured.

Metal\_Recycling\_Container.jpg



The C2 aircraft has been approved in FY 2015 for the use of non-chromate primer applications on aircraft components.

C2\_Aircraft.jpg



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C2\_Aircraft.jpg