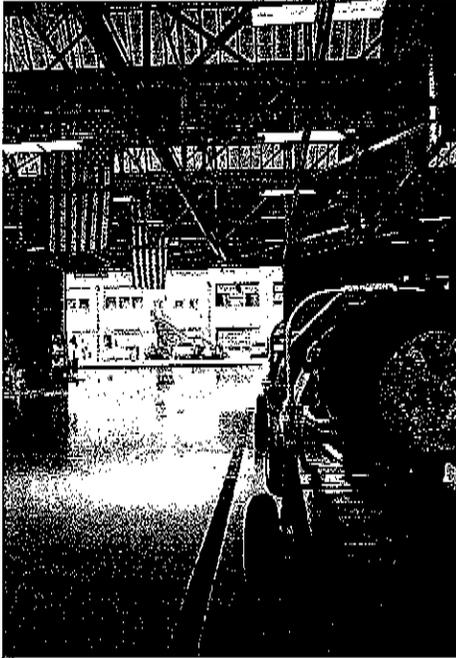


INTRODUCTION



Fleet Readiness Center Southwest (FRCSW) is an integrated team of civilian and military personnel providing comprehensive aviation maintenance, repair, and overhaul support to U.S. and allied warfighters. Located within the island resort community of Coronado, California, the command has a proud history covering almost the entire lifespan of U.S. Naval Aviation. The mission at FRCSW is to deliver responsive maintenance, repair, and overhaul products and services in support of Naval Aviation and National Defense objectives. This includes a complete range of maintenance and repair on aircraft, aircraft components, aircraft carrier catapult and arresting systems, and marine gas turbine engines. In Fiscal Year (FY) 2014, FRCSW provided 171 aircraft to the fleet and 43,000 aircraft components, this included 41 F/A-18, 53 H-60, 22 H-1, ten H-53, 23 E-2/C-2, 17 JSF and five AV-8B Aircraft. The largest of 32 tenant commands on Naval Air Station North Island, FRCSW occupies 81 buildings with over two million square feet of workspace, and employs approximately 700 military

personnel, 2,795 civilians, and 490 contractors.

The facility is located on 358 acres in the City of San Diego. It is bordered on the North and East of the San Diego Bay, on the South by the residential neighborhoods of the City of Coronado, and on the West of the Pacific Ocean.

BACKGROUND

FRCSW operates a multitude of major industrial processes and equipment in a variety of applications including: painting, abrasive blasting, chemical stripping, electroplating, chemical cleaning and degreasing, engine testing, machining, non-destructive testing, composite repair, heat treating, and foundries. FRCSW also has several hundred minor processes within these shops that utilize hazardous materials and generate additional waste streams. In FY2014, the command disposed of 767,000 pounds of hazardous wastes and sent approximately 500,000 gallons of hazardous waste water to its industrial wastewater treatment plant.

FRCSW operates these activities in one of the most stringently regulated areas of the United States. The adjacent city of Coronado is an influential retirement and resort community with citizens who have the time, resources and knowledge to involve themselves in community issues. FRCSW works diligently to incorporate community concerns by using a proactive environmental planning and compliance strategy, with our ISO 14001 registered Environmental Management System (EMS) as the key to sustaining environmental quality.

Environmental Program Office. The Environmental Program Office (EPO) provides FRCSW with a staff of experienced personnel that have the regulatory knowledge and industrial

experience critical for continual compliance. The staff is comprised of twenty one individuals, nine of which are Chemical Handlers who collect hazardous/industrial wastes, provide maintenance for chemical solution processes, and chemical cleaning services to the production shops. The other twelve are comprised of managers, supervisors, engineers, and specialists who use their experience and knowledge to ensure compliance. In addition to this staff, Environmental Representatives are nominated from each shop to communicate production needs and changes to the EPO and are required to proactively enforce compliance on the shop level.

Internal Communication. The Environmental Representatives are trained annually by the EPO hazardous waste trainer and frequently communicate with their building's Environmental Protection Specialist (EPS) for assistance and support. This approach not only ensures that environmental compliance requirements are continuously met, but also promotes two-way communication between EPO and the shops to foster organizational learning. For example, representatives have expressed the difficulties of performing both their environmental duties as well as their primary production duties. The EPO has responded to this need by introducing several Maintenance Management Specialists (MMS) to be the primary representatives of the production shops. They are assigned to multiple buildings to directly oversee and enforce compliance. This allows the representatives to shift their workload towards production while maintaining their direct involvement in environmental compliance.

Community Outreach. FRCSW's cultural tradition includes the long term participation and support of numerous community organizations and groups.

- In September 2014, the *San Diego Business Journal* interviewed FRCSW's Energy Program Managers to discuss the command's conservation projects and energy awareness programs. The interview will be published and will serve as an example to promote energy management and conservation.
- FRCSW has partnered with San Diego State University in the *Math Engineering and Science Achievement* program, which encourages and supports underrepresented students going into the fields of science, math and engineering.
- FRCSW was one of the first groups to be included on the Navy digital publication (application) called *Energy Warrior*. The app highlights the efforts of Sailors and other naval personnel who are taking innovative steps to conserve energy and lead behavioral change. The Energy Warrior application can be downloaded for free on iTunes and Google Play.
- The *Restoration Advisory Board* is a group of San Diego citizens that are actively engaged in the environmental remediation projects at NAS North Island and Naval Base Point Loma. FRCSW participates in this group to plan and facilitate underground drilling to monitor and cleanup potential underground contamination from previous operations.
- The annual *San Diego Earth Works' EarthFair* event draws over 50,000 San Diegans and area visitors where FRCSW sponsors a booth highlighting the command's environmental achievements.
- The annual *Coronado Flower Show* is held right outside the NAS North Island fence line and provides additional opportunities for exchange of information with our Coronado neighbors.

- FRCSW's public affairs office (PAO) hosts multiple outreach programs with over 200 visitor groups a year to provide information and teach the community about the command. The community may voice their concerns during this time. They may also contact the PAO via email, phone, or FRCSW's community website. No complaints were received during FY2013 and FY2014.

ENVIRONMENTAL MANAGEMENT SUMMARY

Environmental Management System. FRCSW's ISO 14001 EMS was third party registered in 1999, six years prior to the requirement in Executive Order 13148. FRCSW has sustained its environmental posture through effective implementation of the EMS and a long history of continual improvement. Recent improvements focused on clear documentation of instructions for continuation of the EMS program. The program has exceeded the expectations of external auditors and did not receive any nonconformance in the past two years.

Internal Auditing. The internal audit process is a key factor in the success of the EMS at FRCSW. For many years, FRCSW struggled to maintain well qualified and dedicated internal auditors. To correct this, FRCSW brought on a part-time contractor to provide consistency and experience to help maintain the ISO 14001 registration. This brought upon the "audit sortie", a process that incorporated an internal audit schedule to sustain environmental conformance throughout the year. This involves auditing all the applicable elements of the ISO 14001 standard at once on a shop-by-shop basis as well as identifying new and potential environmental aspects. Potential environmental violations and process improvements gained during audit sortie are documented, shared and disseminated via an internal audit report. FRCSW's EMS is not only sustaining conformance to the seventeen elements of the ISO 14001 standard, but also providing valuable corporate knowledge, sharing successful process with other organizations, and increasing interdepartmental communication. This communication is achieved using the e-CAM (electronic continuous analysis and monitoring) software. All nonconformances from internal and external audits are logged and tracked until a corrective action has been implemented. This also allows previous findings and solutions to be studied for continuous improvement. Because of the value of internal audits and e-CAM, FRCSW has increased the frequency of the internal auditing cycle from 18 months to 12 months.

Training and Operational Controls. The EPO program elements are designed to sustain environmental compliance and provide continuous improvement for all media programs. Operational controls are deployed through a multitude of mechanisms at FRCSW. For example, each production shop is assigned an environmental representative who communicates directly with the EPOs' specialists to maintain compliance within their shop. They are provided four hour training annually by the EPO. The EPO has also developed "Environmental Bulletins" which cover various topics such as spill controls, storm water pollution prevention, and hazardous waste segregation. These are updated annually and all process streams are trained annually using these bulletins as a backbone. To increase effectiveness, the bulletins also have specific training sections addressing special environmental requirements dependent on the process or operations. In addition, all employees are provided with basic environmental awareness training. As a safety and precautionary measure, EPO specialists are required to actively provide support to ensure compliance to all regulations.

Continual Improvement. Continuous process improvement is ingrained in the culture of FRCSW. Employees and managers receive regular training on LEAN manufacturing, Six Sigma, and Theory of Constraints. At any given time, there are a significant number of process improvements ongoing throughout the plant as individual departments host continual LEAN and Six Sigma events to realize operational efficiencies. Environmental process improvement is monitored with key metrics designed to measure success relative to the goals and objectives. FRCSW sets goals aimed at reducing impacts on the environment, maintaining conformance to the ISO 14001 standard and continuing as an active participant in the community.

Sustainability Scorecard. As part of its strategic planning process, FRCSW has adopted the balanced scorecard approach to provide a performance and progress snapshot of the Command's goals and objectives. The "Sustainability Scorecard" addresses environmental stewardship, financial performance, and improved community and stakeholder relations. The EPO seeks to continually improve its financial, stakeholder, and environmental posture by receiving no violations, increasing public relations, and reducing operating costs via conservation projects.

Table I - Sustainability Scorecard

Sustainability Factors	Objective	Target	Results	
Environmental Stewardship	Maintain compliance with hazardous waste management regulation	No Violations	No Violations	
	Maintain compliance with wastewater regulation	No Violations	No Violations	
	Maintain compliance with storm water regulation	No Violations	No Violations	
	Maintain compliance with air quality regulation	No major notice of violations	No major Notice of Violations.	
	Comply with ISO 14001 Standard	No non-conformances	No non-conformances	
	Reduce environmental impacts	Reduce energy consumption		7.2% reduction (FY13/FY14)
		Reduce water consumption		3.6% reduction (FY13/FY14)
		Reduce industrial wastewater generation		9.0% reduction (FY14 from 2011 baseline)
		Reduce containerized waste		12.4% reduction (FY14 from 2011 baseline)
Community and Stakeholder Relations	Interact with community regarding environmental issues	Participation in community events and host public tours	Participated in EarthFair and hosted multiple public tours	
		Receive no complaints	No complaints received	
Financial Performance	Reduce operational costs to the Command	Reduce environmental program costs by 5%	FY14 costs were 7.96% below budget	

ACCOMPLISHMENTS

Hazardous Materials and Waste Management Program. FRCSW recycles all economically feasible hazardous and non-hazardous wastes. Recycled hazardous waste includes batteries, abrasive blast media, mixed oil, solvent, JP-5 fuel, ethylene glycol, and calibration fluids. Recycled non-hazardous waste includes all paper materials, metals, old appliances, and electronics. In FY2013 and FY2014, FRCSW recycled 144 tons of metal, 183 tons of paper, 12 tons of batteries, five tons of plastic, 19 tons of solvent and 156 tons of blast media. The EPO has also streamlined the waste collection and disposal process. The changes include new operational controls, waste consolidation, lighter containers and awareness training deployed plant wide. To ensure proper segregation of hazardous wastes and recycling, employees utilize instruction poster boards and the environmental training bulletins provided by the EPO as reference.

Air Quality Management Program. FRCSW, a Clean Air Act Title V facility, has 150 permitted processes ranging from engine testing, painting, solvent cleaning and paint stripping to stationary combustion sources. Key in air quality management is the fact that California is continuously promulgating new air quality regulations, requiring a constant effort to ensure compliance while containing costs and meeting mission requirements. To increase compliance to these regulations, the air program streamlined reporting and inspection procedures in written documents and checklists in FY2013. The program has also managed to implement proactive compliance measures such as placards to better communicate air quality compliance and reduce potential Notices of Violations.

AIR PERMITTED OPERATION

At Any Time During
Lead Melting

- The Melting Pot Shall Not Be Used Without The Temperature Control System In Operation
- All Lead Metals Shall Be Sufficiently Clean Prior To Charging In The Melting Crucible
- Record
 - The Amount And Type Of Non-ferrous Metals Charged

Air Permit #
960920

Building
65



Equipment
Metal Melting/Casting
Small Lead Pot, 800 lb
Capacity

Please E-Mail FRCSW_AIR@NAVY.MIL For Questions

Although FRCSW is well below mandatory reporting thresholds for California's AB-32 legislation for greenhouse gases (GHG), FRCSW reduced CO₂ emission by over 5,500 metric tons since FY2009. FRCSW has also replaced a total of ten forklifts in FY2013 to comply with California's Air Resource Board's mobile equipment regulations. This has reduced hydrocarbons/nitrogen oxide (HC/NO_x) emissions over 1.3 tons per year and saved hundreds of hours of downtime due to repairs. FRCSW plans on continuing the process by replacing ten additional

forklifts in FY2015. This will reduce emissions by an additional 0.7 tons or more of HC/NO_x per year. In FY2014, the air program also implemented a database to monitor and limit the usage of older forklifts until the arrival of new forklifts.

FRCSW holds its own Title V air permit. In FY2013, the command released 26.7 tons of regulated criteria pollutants to the atmosphere; in FY14, FRCSW reduced this to 16.1 tons of criteria pollutants. Compared to 38 tons of criteria pollutants released in FY2009, FRCSW has made great progress in reducing its air emissions by using higher efficiency control equipment and more environmentally friendly products.

Energy & Water Conservation. FRCSW's energy and water conservation team have developed a holistic energy plan that incorporates energy awareness, new technologies to improve existing systems, increasing equipment performance, and identifying sustainable building infrastructure solutions. Fostering the concept that "if you can't measure it, you can't manage it", the team has incorporated many different levels of metering, sub-metering and monitoring of their processes and buildings. The team collects monthly utility reports including electricity, steam, natural gas, compressed air, sewage, and water from all buildings looking for anomalies by juxtaposing usage against the previous months and years, and comparing against minute-to-minute sub-metering through their Direct Digital Controlled (DDC) energy management system. These reports help delineate energy and water waste-streams versus legitimate controlled usage. The reports are distributed to all levels of FRC's organization, from the artisans to the Commanding Officer, requesting input to explain anomalies such as increased workload, leaks that have been discovered or additional industrial equipment that has been added. By integrating all levels of the organization, the energy management team has been able to cultivate a management program that employs the principle that front-line employees should have the authority to make changes and other decisions at the lowest level. This has led to a successful energy awareness and Building Energy Monitor (BEM) program that helps limit or eliminate waste before it happens.

In addition to the utilities monitoring, the team also performs a multitude of audits and feasibility studies for potential conservation projects. From 2013-2014 over one million square feet of space have been audited for all major utilities, helping develop \$69M in energy and water projects, far exceeding the requirements for energy audits put forth in the Energy Independence and Security Act of 2007 (EISA).

Since FY2013, the team has reduced energy (electricity, steam, and natural gas) consumption through process improvements and optimization schemes by 7.2 percent, equating to almost 18 billion BTUs of savings. This has equated to a reduction of greater than 30 percent since FY2006, surpassing federal goals under EAct 2005 and Executive Orders 13,423 & 13,514. As a result of these accomplishments, the team has received both the NAVAIR Commanders Award for Energy and Water Use Reduction and the SECNAV Energy and Water Management Award in 2013.

In FY2014, FRCSW entered into an Energy Savings Performance Contract (ESPC). The ESPC process involves financing the cost of energy conservation projects, then using the savings from the utility bill resulting from these projects to pay off the loans. FRCSW currently has developed projects that will upgrade antiquated compressed air systems and industrial equipment, which will result in a savings of \$2,200,000 annually. These projects will earn utility rebates of \$420,000 which will be used to implement further energy and water conservation projects. In addition to developing financed projects, FRCSW's energy management team has continued process optimizations with low/no cost measures that have reaped savings of \$115,000/month at their largest industrial building by changing the sequence of operations in their air scrubbed ventilators throughout the building.

Table II – Completed and Ongoing Projects			
Project Description	Status	Sustainability	
		Financials	Environmental Performance
Air Handler's Optimization	Completed FY13	Savings: \$126,388/year Rebate: \$100,000	Reduced energy use by 1037 MMBtu/year
Energy Management Control Systems (EMCS) to control lighting	Completed FY13	Savings: \$20,645/year	Reduced energy use by 440 MMBtu/year
Air Meter Gradation	Completed FY13	Savings: \$18,792/year	95% reduction with 7,064.6 KCF/year compressed air savings
Isolation Valves for Air, Gas, and EMCS upgrades for heaters	Completed FY13	Savings: \$23,933/year	59% reduction with 4,051.5 KCF/year compressed air savings/1,028 MMBtu savings for heater
Sequencing of Steam to Rooftop Air Handlers	Completed FY13	Savings: \$446,885/year	Reduced energy use by 7,933 MMBtu in four months
Upgrading of 178 Steam Traps	Completed FY14	Savings: \$112,000/year	Reduce energy use by 2,000 MMBtu/year
Decommissioning of Data Center	Completed FY14	Savings: \$110,000/year	Over 50% energy use reduction
FRCSW Building Lighting Systems Improvement	In Progress	Savings: \$163,905	Will reduce energy use by 1,074 MWH
B.379 Calibration Lab Upgrades	In Progress	Savings: \$106,419/year	Will reduce energy use by 1,156 KGAL
Comprehensive HVAC Retrofit-AHU/Boiler/Chillers	In Progress	Savings: \$1,080,129/year	Will reduce use by 12,873 MMBTU and 2,834 MWH
Decentralize Compressed Air w/ Optimization	In Progress	Savings: \$1,000,340/year	Will reduce compressed air use by 350,518 KCF
Water Conservation Measures	In Progress	Savings: \$34,433/year	Will reduce water use by 1,216 KGAL
Conforming anodes for chrome plating process	Completed FY14	25% less operating cost with 70% less plating time	Reduces up to 95% waste materials, 70% less hex chrome emissions, and 30% energy savings
Hexavalent Chromium free primer for E2/C2	Completed FY14	None	Eliminates hex chrome usage in primers
Portable vacuum with sanding tools	Completed FY 14	None	Eliminates 99% of particulates from sanding and grinding tools
Bio-media blast booth	Completed FY 13	25% less media cost and 50% less waste cost	Reduces 50% plastic media waste by utilizing bio-media
Mini-max steam cleaning system	Completed FY 13	100% lower waste water cost	Eliminates waste water by 100%
Rinse water tank recycling into aqueous alodine tank	Completed FY 14	Savings: \$4,000/year	Reduces waste water by 3,000 gallons/year