



# Energy Management and Environmental Control

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## Fleet Readiness Center Southwest Naval Air Station North Island

"Fix it once, Fix it right, Fix it on time"

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### Introduction Projects Results

Fleet Readiness Center Southwest (FRCSW), NAVAIR's principle aircraft facility in the Southwest Region of the United States, is a leader in innovative aviation solutions, supporting the most advanced aerospace technologies and offering top quality products and services at the best value in the fastest time.

#### FRCSW Motto:

"Fix it once, fix it right, fix it on time"



With an increasing demand for "Green" and world-healthy technology, the Environmental management team within FRCSW is responsible for energy and water conservation, the implementation of government regulations and mandates, and minimizing the environmental impact of the Maintenance, Repair, and Overhaul (MRO) of the Nation's War fighters.



This summer, we were able to gain some great hands on experience in environmental control and energy management fields.

#### Energy Management

With energy efficiency as a main priority, "Techval" projects allow opportunities to test and apply newer, more efficient technologies to the multiple buildings that make the MRO of the nations aircraft possible.

During our time at FRCSW, lighting audits allowed us to see first hand the benefits and savings of high efficiency Fluorescent lamps, and explore the newest lighting technologies such as Induction, LED, and Spectrally enhanced lighting.

Exploring HVAC (Heating Ventilation Air Conditioning) technologies such as Solar AC, Condensing Water Heaters and Boilers, and Highly Insulated Windows also gave us a deeper understanding of energy efficient climate control.

#### Environmental Control

Our other task dealt with Air Permits, which allow FRCSW to operate equipment that emit pollutants into the earth's atmosphere. The air permits allow for the equipment to operate and still be environmental friendly and safe. There are approximately 145 permits on the Navy Base, ranging from abrasive blasting, chrome plating and cold solvent degreasers.

These permits are regulated through the Title V - Operating Permit Program. This program works with the Clean Air Act that requires states or local air districts to develop a program to issue federal operating permits that affects facilities.

The multiple audits that we completed allowed us to learn a great deal about the Ins and Outs of efficient lighting. The hands on experience we received allowed us to comprehend the inefficiencies of antique incandescent lights, which are being phased out through the adoption of "Green," more efficient lamps such as HID's, Low and High pressure sodium, metal halide and linear fluorescent lamps. Also studying the particulars of a lamp's Lumen output, its CRI index, its burning color temperature, average rated life etc. has allowed us to use the theory of what we have studied in school, and apply it to real world situations.

Energy saving opportunities such as Daylight Harvesting for example uses a combination of skylights, photocells or occupancy sensors, and reflective materials, to use as much free, natural sunlight to meet required lighting levels. Using natural light drastically reduces energy costs, and maintenance costs, allowing a quicker payback of capital.



In addition to the techval projects, we have learned a lot about different aspects of environmental engineering. We learned when and why air permits are needed.

Facilities are required to obtain permits for any operations or equipment that emits or is capable of emitting air contaminants.



Air contaminants can be dust, mists, fumes, vapors odors or gases. Other operations considered to have minimal potential have been exempted from permit requirements. Operations and equipment are required to have District permits both prior to construction or installation and again before any operation begins. A permit modification is required for: expansion, relocation, physical changes, process changes, ownership changes, emission increases or decreases.

#### Conclusions

Through our internship with FRCSW we have received a sample of the experience and real world job training which we will need to become successful engineers. As we have learned, a career in engineering is very interesting, although filled with a rigorous workload and list upon list of deadlines. Yet we feel that being an engineer best fits our strong work ethic and dedication to its science and practice.

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