China Lake conservation leads to big savings

Gerald Harper, Naval Air Warfare Center Weapons Division Energy Compliance Program lead, stands in front of one of the China Lake, California aircraft hangars. Large hangar doors release huge amounts of heating and air conditioning with each opening. A new automated release switch shuts off heating and air conditioning while the door is open. (U.S. Navy Photo)

NAVAL AIR WEAPONS STATION CHINA LAKE, Calif. - An energy reduction program today returns nearly 30 percent in savings for Naval Air Warfare Center Weapons Division compared to 2003. The command will reach the 2015 Navy energy and conservation goal by applying new ideas, implementing common sense and monitoring to optimize saving. Conserving resources comes from simple conversions to LED light fixtures, to more elaborate base landscape changes resulting in dramatic water saving.

A small team researches, measures and monitors every kilowatt, Btu and drop of water used at China Lake. Known as resource efficiency managers, they understand accountability. There is one Naval Facilities Engineering Command employee and two REMs on the team. The goal for the two REMs is to return an energy savings twice the amount of their employment costs. This goal is written into their contract. NAWCWD is the first Naval Air Systems Command Warfare Center to deploy REMs. They search for unique ways to conserve resources, monitor results, and save energy dollars.

The Navy goal for China Lake is a 30 percent energy reduction from 2003 to 2015. Energy

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reduction stands at 29.86 percent, recorded during the most recent energy audit. The energy goals include electricity, oil, gas and propane. However, water conservation is a big deal here, too.

China Lake is located on the edge of the Mojave Desert, making water conservation a hot topic on base and in neighboring towns. Naval Air Weapons Station identifies ways to reduce the flow of water at China Lake. NAWCWD is doing its part by reducing 73,000 gallons a year – a whopping 43.45 percent since 2008. This is 35 percent beyond the 2015 Navy goal.

The largest water reduction project to date was completed earlier this year. After extensive site surveys, the Infrastructure Business Operations department joined NAVFAC to identify areas where there is no need for turf. Water irrigation costs drastically reduced after this turf removal and xeriscaping at six NAWCWD facilities. Recent estimates calculate the project savings at $23,000 per year.

Energy and water monitoring is critical to reach Navy goals. Computer monitoring and the ability to adjust building energy settings help. The weapons division facilities department collaborated with NAVFAC to set up a digital control system network. The network allows each facility manager to monitor and adjust energy settings from a computer desktop, and throughout the command gives managers real-time usage reports. This detailed and immediate data leads to optimizing performance, according to NAWCWD Energy Compliance Program lead Gerald Harper.

“We watch for anomalies beyond the optimum conservation performance,” Harper said. “And we ask: What can we do to correct the anomaly? Can we move a project to nighttime operations? Could we warm the building up a bit later in the morning, or reduce the heating earlier in the afternoon? These are questions we can answer with the digital control system management network.”

Huge savings can start with small changes. One 25 cent switch cover returns $25 savings per year. The cover requires an extra motion to turn on each bank of lights in a room. So, instead of turning on all light switches without consideration when entering a room, the user is more likely to switch on only the lights they need to do their work. Soon, nearly 2,000 of the covers will be in place. It is a simple and inexpensive idea that will eventually return up to $50,000 each year.

More elaborate conservation projects grab the attention of utility companies servicing China Lake. Energy savings was a priority during the planning for a new boiler plant, resulting in a more efficient facility. This advance planning is resulting in an $80,000 rebate from the local gas utility, which is eager to reduce demand spikes. The new boiler plant will drop the cost of steam supplied to the base, resulting in lower utility costs at NAWCWD. Another $40,000 rebate application is in the works for participation in a demand reduction program.

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This program involves 22 NAWCWD and 18 other China Lake facilities.

All rebates help fund future base-wide conservation projects, according to Harper.

A team effort goes into implementing – big and small – resource saving measures. Leaders of NAVAIR, NAVFAC and the weapons division are part of the Command Energy Board chaired by Capt. Richard Wiley, commanding officer of NAVAIR, China Lake. The board meets quarterly to review usage, current and future projects. Harper represents the weapons division on the board, and is now working on a major building audit.

These extensive energy audits at 68 NAWCWD buildings cover structures, insulation, air, heating, and electrical use. The audit began on Oct. 20. The results lead to recommendations for new projects during the coming years. One new project is “advanced power strips,” or APS. According to the General Services Administration, commercial plug and process loads – for example office fax, printers, computers – could be cut by as much as 48 percent with APS. APS automatically power down when not in use, or when no activity is detected in the room. Some are software-programmable. Harper was attracted to the potential savings.

“The power strips are free from National Renewable Energy Laboratories. We are testing now. If we can document acceptable savings, we could be eligible to receive free APS,” Harper said.

“Old-school” power strips and incandescent light bulbs are quickly becoming antiques throughout China Lake. Nearly 40 outdoor, pole-mounted, incandescent floodlights are being replaced at the NAWCWD Michelson Laboratory by compact fluorescent lighting. The more efficient –but equally as bright – lighting -will save nearly $60 per day, or more than $20,000 per year.

Large generators provide power to remote testing ranges. Total cost for these generators is more than $1.25 million annually. For example, one remote testing range recently deployed eight generators -– producing a total of 600 kilowatt of electricity – for 16 hours a day. Plans are underway to eliminate generators and to run permanent power lines to the ranges. The change also benefits air quality, reduces roadway wear and slashes maintenance costs. The proposal for such a large project is under consideration now, but the math looks good on paper, according to Harper. The “math” on the power line proposal includes a return on investment within five years.

“Any return on investment less than seven years is a win-win,” Harper said. “Generators have great costs associated with them from maintenance to fuel to transportation.”

Other NAWCWD conservation projects include:

- Replacing outdated office refrigerators with newer, Energy Star rated units.

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- Retrofitting lights in the ordnance operating facilities with LED lights.
- Building a strong network for idea sharing with local utility companies.
- Reclaiming five water ponds for a savings of three million gallons per year.

Bill Cords, director NAVAIR Infrastructure Business Operations and NAVAIR Energy Team Facilities and Infrastructure Pillar lead, recognizes the successful NAWCWD program.

"NAWCWD China Lake has a very strong shore energy program that is demonstrating reductions in overhead costs and energy and water consumption by successfully implementing shore energy conservation projects and process changes," said Cords. "They are tightly integrated with the NAWS China Lake Energy Management Program and are highly committed to supporting Navy and DoD shore energy goals and energy awareness."