NAS Jacksonville Implements Sustainable Sewage Sludge Treatment

New System Consumes Significantly Less Energy

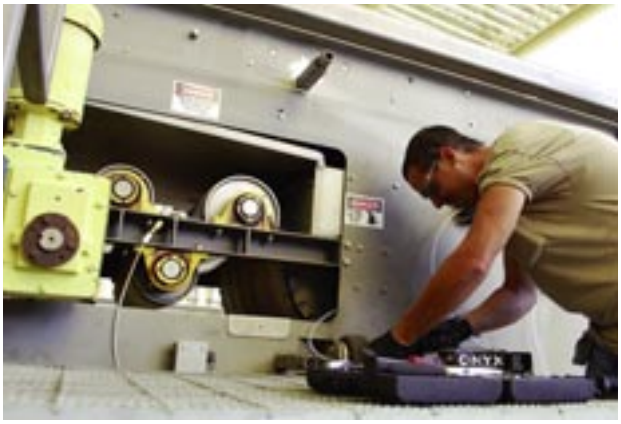
THE NAVY HAS established aggressive targets for reducing energy consumption and increasing renewable energy production. To help achieve the goals laid out in the Navy's energy program, personnel from the Naval Air Station (NAS) Jacksonville, Florida recently installed an innovative (first-of-its kind for the Department of Defense) sludge treatment solution at its wastewater treatment plant to reduce energy consumption, lower costs, and recycle waste.

This newly-installed sludge treatment system relies on simple, safe and repeatable chemistry to achieve disinfection of sewage sludge and organic waste. Traditional sludge treatment systems rely on energy intensive and difficult to control biological or thermal systems. The system uses two separate chemicals to safely generate chlorine dioxide (common disinfectant) onsite for disinfection and odor elimination of the sewage sludge. The process is completely automated and computer controlled to ensure consistent operation.

During the treatment process, sludge generated at NAS Jacksonville's wastewater treatment plant is pumped to the new system's chemistry injection system where the chlorine dioxide is generated and added to the sludge stream. The sludge flows through the process control system where it is disinfected and odor-causing compounds are destroyed. Sludge treatment that previously took four to six weeks now takes 10 minutes with the new system. Following treatment, the disinfected, odor-free product is dewatered using the existing belt press and then collected and transported to a permitted land application site where the nutrient content is recycled.

The new sludge treatment system consumes significantly less energy than the aerobic digesters previously used for sludge treatment at NAS Jacksonville. Traditional treatment via aerobic digestion required substantial energy to power the motors that

Casey Cochran, utilities supervisor for Richard Brady and Associates, left, points out some of the unique functions of the solenoid valve for the Clean B Solution to Jay Caddy, commodity manager for NAS Jacksonville Public Works Utilities and Energy Management. The valves filter the water for after it is disinfected either into the Chemical Sludge Treatment System or back to the wasterwater treatment plant to be retreated.

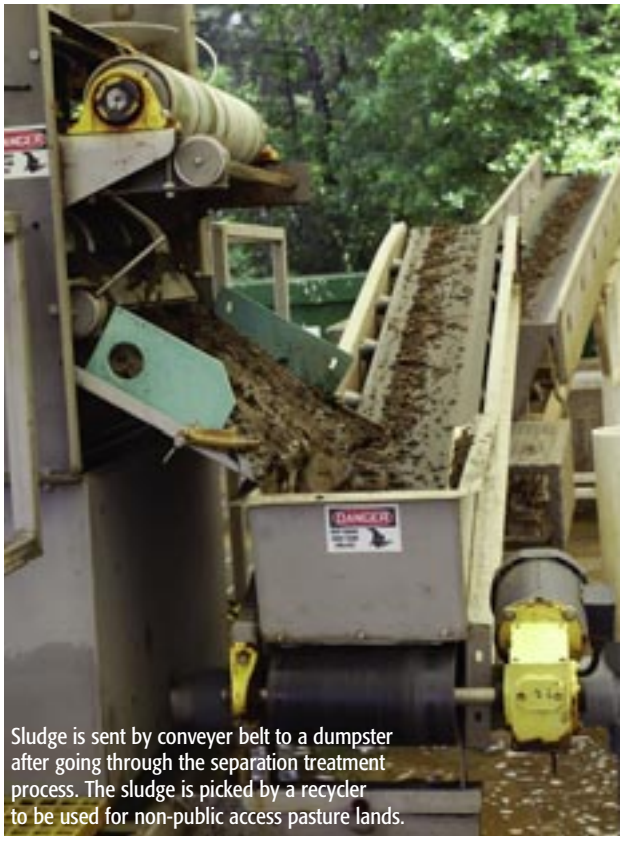


Kevin Savela, general maintenance worker with Richard Brady and Associates, works on the air system of the belt filter press at the Wastewater Treatment Plant.

were needed to continuously mix and aerate sludge. Converting to the new system has reduced sludge treatment energy consumption from close to one million kilowatt hours (kWh) per year to an estimated 500 kWh per year. This substantial energy reduction will result in savings to NAS Jacksonville of around $75,000 in 2013. Based on projected increases in energy costs, the base will save an average of $107,000 per year of energy over the next 20 years. One additional benefit will be the reduction in operation and maintenance costs and recapitalization of aging infrastructure due to the elimination of a primary clarifier, sludge thickener and two aerobic digesters at this facility.

The Navy's shore energy policy is more than environmental stewardship and lowering energy bills. Energy is a strategic resource, and developing efficient operations that rely on resilient energy sources is a matter of national security.

The Chemical Sludge Treatment System, tanks and components treat an average of 40 gallons per minute of waste sludge from the NAS Jacksonville Wastewater Treatment Plant.



Sludge is sent by conveyer belt to a dumpster after going through the separation treatment process. The sludge is picked by a recycler to be used for non-public access pasture lands.

Naval forces depend on constant support from shore operations, and energy security is essential for powering our critical shore installations now and in the future. Therefore, the savings being realized by the new system, coupled with the energy savings, result in a simple payback of 6.3 years for the $700,000 investment in the system.

This $707,000 energy project was awarded to Aerostar Environmental Services in April 2012. BCR Environmental designed, built and installed the system and completed the project in October 2012. ⚓

Photos by Kaylee LaRocque.

CONTACTS

Miriam Gallet
Naval Air Station Jacksonville
904-542-5588
DSN: 942-5588
miriam.gallet@navy.mil

Sue Brink
Naval Facilities Engineering Command Southeast
904-542-6622
DSN: 942-6622
susan.brink@navy.mil