Energy Security

How MCLB Albany is optimizing the installation to support sustained operations

by Mr. Hubert "Ski" Smigelski

Marine Corps Logistics Base (MCLB) Albany's commitment to energy security has resulted in a more ready and mission-capable Marine Corps. With the vision "to lead the nation as the most energy-efficient and energy resilient customer-focused enabling platform for our Operational Forces," the base uses a multi-pronged strategy to accomplish its mission as a readiness enabler, focusing on: innovating uses of distributed energy generation to reduce reliance on a commercial grid, driving new cybersecurity and energy information strategies to provide secure and accurate energy data, and reducing energy costs through efficiency efforts and system improvements.

Leaning fully into the adoption, coordination, practice, and application of Marine Corps Policy Letter 9-19 and the three-pillar framework for energy security has led to significant progress in MCLB Albany's utility/energy security and sustainability. In Fiscal Year (FY) 2020, the installation reached its goal of covering all critical building energy loads in the event of an outage by increasing its sources of on-site generation. MCLB Albany completed an 8.5MW smart grid-enabled biomass steam-to-electric generator to complement 4.1MW from two dual landfill-methane/natural gas generators, 7MW of traditional backup generators, and a 31MW solar farm to support its regional outage priority. The generator project is an incredible asset in the installation's energy security portfolio that can cover a significant portion of the base's critical energy demand with a renewable-fueled generator in the event of a loss of main generation or commercial supply.

>Mr. Smigelski retired from federal service on 31 December 2021. At the time of his retirement, his civilian rank was GS-14.

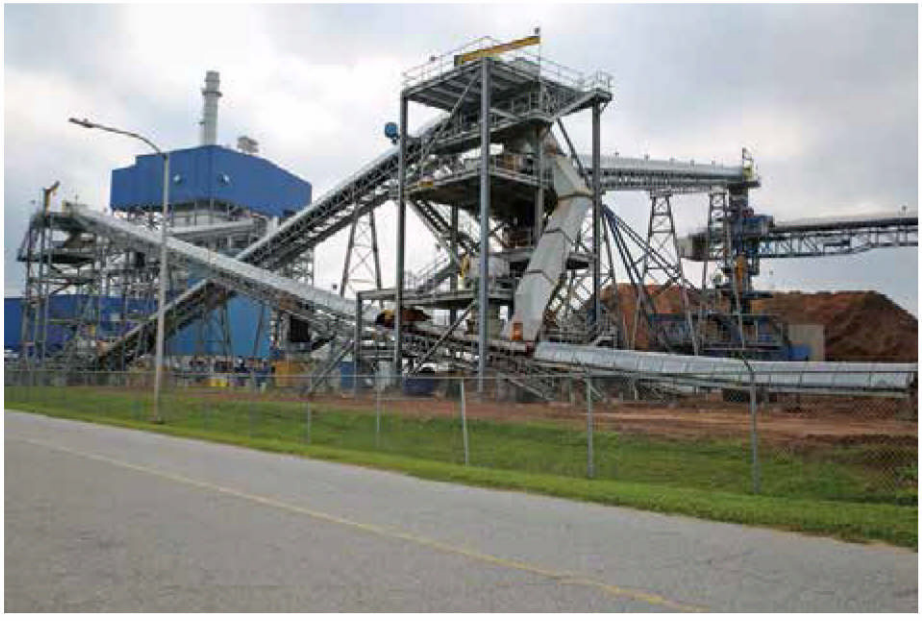
In January 2017, MCLB Albany suffered severe infrastructure damage following a tornado, demonstrating the imperatives for energy security and resilience. *(Photo by Nathan Hanks.)*

Additionally, MCLB Albany benefits from its bore hole thermal energy storage systems (BTES). The BTES is a type of ground source heat pump, but rather than simple single-line wells that act more like a radiator, the system is comprised of a circular field of wells that perform more like a battery—removing heat in the warmer months and storing it for the cooler months. The BTES systems produce over 50 percent in electric utility savings and eliminated water cooling requirements. By the end of FY 2020, MCLB Albany had reduced both its energy use intensity by over 29 percent compared to FY 2015 baseline and potable water intensity by 55 percent compared to the 2007 baseline!

Through all these renewable energy projects, MCLB Albany will be the first DOD installation to reach energy net-zero. Net-zero means that 100 percent of the energy used has been produced on-site from renewable sources. This net-zero must occur over twelve months. MCLB Albany has easily clipped net-zero for nine months and is on target to be officially energy net-zero in February of 2022.

MCLB Albany has a Facilities Related Control (FRCS) pilot project in place to collect data from all current standalone systems into a central platform. This will enhance advanced aggregated data analytics, create a single source for all data and visibility requirements, and increase scalability while decreasing risk and vulnerabilities. Current capabilities include centralized monitoring and configuration of utilities and building automation controls, advanced analytics for energy and controls data, and alarm visibility from a map interface.

The FRCS pilot includes the integration of an artificial intelligence (AI) platform that will collect and aggregate



In 2021, MCLB Albany was one of two Marine Corps installations to receive the SECNAV Energy Excellence Award for outstanding contributions to energy security, new technology, innovation, and recognizing efficiency and progress toward energy resilience and self-sufficiency. *(Photo by Jennifer Parks.)*

data, create baselines for normal behavior, and detect anomalies for both preventative and predictive maintenance. Preventative maintenance is often based on hours of operation or simply length of time, requiring hundreds of manhours to change out parts that often still have substantial service life. In the face of declining budgets and shrinking manpower, the Installation & Environment Division personnel decided to start looking at both facility and equipment maintenance through a different glass. If there was a way to predict component or system failure before it happened and maintenance could then be performed, many shutdowns could likely be averted. MCLB Albany predictive analysis allows MCLB Albany to transition from routinely scheduled maintenance to maintenance when necessary, reducing labor and material costs, and strengthening production security.

The biggest challenge in setting up a system of sensors and controls that will communicate across the Marine Corps network is ensuring that all devices, connections, and communication data can be certified as safe and protected. This initially required obtaining an Interim Authority to Test. The Interim Authority to Test is a recognition from the authorizing official that we can test the system for one year. If the project shows that this should be a permanent solution, we will validate the system for controls and security implementations. We have already created a System Security Plan. If the decision is to make this permanent, then the request would be submitted to obtain an Authority to Operate the system on the Marine Corps Network.

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The base is currently engaged in adding sensors and controllers for Production Plant Albany's (PPA) blast booth. This new system will send the data collected to the artificial intelligence platform for analytics of equipment conditions. The ability to detect anomalies (reduced airflows, significant pressure changes, equipment vibrations, etc.) will give us a better picture of how the equipment is performing and when certain components may need to be evaluated for maintenance. We predict that this will drastically increase equipment availability and efficiency.

MCLB Albany will conduct Business Case Analysis and Return on Investment studies at the conclusion of the project. The outcome(s) will be provided to MCICOM for determination of solution implementation across the Marine Corp Enterprise. Additionally, the Installation and Environment Division will coordinate with PPA to explore further possibilities for integrating operational equipment into the FRCS program.

MCLB Albany is exploring options for phase II of the FRCS pilot, which will integrate additional facilities and production equipment—such as other PPA paint booths (two) and remaining blast booths (four), Geothermal system, and Methane Landfill Gas generators—and will integrate the call for specific system or component maintenance automatically into the USMCMax Work Order generation system.

These initiatives have proven extremely fruitful so far and are ensuring long-term sustainability while saving resources for other critical warfighting needs. Ensuring that facilities, production equipment, and personnel have a redundant and reliable source of power, and that we are securing this through the use of renewable energy sources will be a model for other DOD installations. Indeed, much of our approach has always been to include scalability in the designs, so that the applications could be shared with other installations, creating additional resiliency, and saving additional resources. USMC