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Army Paves the Way for Sustainable and Secure Power in the Middle East

CAMP ARIFJAN, Kuwait - Camp Arifjan has become a beacon of innovation and sustainability with the groundbreaking installation of a first-of-its-kind microgrid system. This project, spearheaded by the U.S. Army Central (USARCENT) Operational Energy Team, U.S. Army Corps of Engineers (USACE), Idaho National Laboratory (INL), and Sain Engineering Associates (SEA), represents a significant leap forward in-military energy management and operational resilience.

The journey to this achievement began with three pilot demonstration projects developed by INL and the U.S. Department of Defense for the U.S. Army Central Command in Kuwait. These initial projects aimed to establish clean energy and sustainability solutions, significantly impacting an area where 99% of power comes from fossil fuels.

The first project successfully guided the hybrid microgrid installation using advanced inverters, battery storage, and solar photovoltaic implementations. This system allowed for a significant reduction in diesel fuel consumption and operational costs, setting a precedent for future developments. The second project implemented a 40-kilowatt carport solar power system, proving that sustainable solutions could effectively replace diesel generation. The third project focused on water reclaiming and recycling, further enhancing environmental sustainability.

Building on the success of these pilot projects, the team was able to scale up and implement a larger, more comprehensive microgrid system at Camp Arifjan.

Jack M. Peters, Operational Energy Program Manager for the ARCENT Engineer directorate, emphasizes the project's significance.

"This isn't only about generating power; it's about ensuring mission readiness regardless of external circumstances. By integrating renewable energy and multiple other power sources, Camp Arifjan is taking control of its own energy security," said Peters.

The microgrid provides balanced control of solar photovoltaic power and a large battery energy storage system, or BESS. It also implements an improved utility grid connection architecture and integrates with a

backup power plant and other control features, offering a multitude of benefits:

The microgrid at Camp Arifjan integrates advanced technologies to optimize energy and distribution feeder management. Solar panels installed across the base capture sunlight and convert it into electricity. This energy is either used immediately or stored in advanced battery systems for later use. During periods of high demand or low solar generation, the stored energy is deployed from the battery system, ensuring a seamless power supply. When the associated power plant generation is needed, the microgrid BESS system can modulate loading on the generators and provide additional power and voltage regulation services into the selected grid configuration.

The successful implementation of this project is a testament to teamwork and dedication. Kurt Myers and Porter Hill from INL were the visionary minds behind the project while Sain Engineering Associates played a pivotal role in translating the concept into reality. The team continues to support construction and implementation in advisory and review roles.

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