

★ **STRONG PARTNERSHIPS** ★

PRESERVING POWER AND PROTECTING THE MILITARY



Dave Barr is a big-time developer. And we're not talking about real estate.

He's building relationships and managing projects that protect military institutions around the world from power outages and cyberattacks.

As director of federal projects at Burns & McDonnell, Barr led efforts to design and build Phase I of the Smart Power Infrastructure Demonstration for Energy Reliability and Security (SPIDERS) project at Joint Base Pearl Harbor Hickam in Honolulu and Phase II of SPIDERS in Fort Carson, Colo. Phase III is underway at Camp H.M. Smith in Aiea, Hawaii. The SPIDERS program is a joint effort among the Department of Energy, Department of Defense (DOD) and the Department of Homeland Security. Burns & McDonnell and the U.S. Army Corps of Engineers are partners on all three projects.

"Our acquisition folks told me after working with Dave's team that they'd never worked with a better contractor," says Harold Sanborn, a technical manager for the U.S. Army Corps of Engineers. "That kind of praise from our contracting team doesn't come easily."



The \$5.4 million Phase I project in Hawaii provides the base with an energy surety microgrid that features new and existing generators and photovoltaic renewable energy sources to enhance reliability of mission-critical facilities. The project also increases energy efficiency while reducing fossil fuel consumption and greenhouse gas emissions.

"Initial testing of the project demonstrated a 30 percent savings in fuel consumed," Barr says. "The things we learned in Hawaii are informing the design and implementation of phases II and III."

Phase II of the SPIDERS project at Fort Carson, near Colorado Springs, Colo., incorporates several diesel generators and a 2-megawatt photovoltaic array, providing efficient and reliable backup power to mission-critical loads at the garrison. The Burns & McDonnell team also developed bidirectional, fast-charging mechanisms for electric vehicles, which allows them to push

power back into the grid and improve power quality of the distribution system.

The technology is the first of its kind.

"The team's success is a testimony to the quality of work Dave encourages his folks to deliver," Sanborn says.

Safeguarding Power and the Future

One of the biggest vulnerabilities of a military installation is a physical attack or cyberattack on power infrastructure.

"A storm like Hurricane Sandy might wipe out transmission lines or substations that could take weeks to repair. But what if someone managed to throw switches in a distribution network?" Barr says. "It could cause damage, explosions and blackouts that could be devastating for months."

A coordinated attack within three or four metropolitan areas around the country would be an even bigger challenge.

"Before now, many military installations were training-oriented," he says. "Now, much of the command and control of overseas missions is done in the U.S. on bases that rely on the grid."

This is why Barr's experience with emerging microgrid technology is important, as is his ability to engage people throughout the military.

"Dave has great vision, is creative and provides our group another industry leader, thereby making us better at what we do," says Eric Kraus, DOD business development director at Burns & McDonnell.

A Unique Project Manager

Growing up in Sioux Falls, S.D., Barr was like many blossoming engineers. He excelled in math and science and was fascinated with how all things worked. When he headed to South Dakota State University, he envisioned himself working in the automotive or aerospace industries.

But his career took him in many other directions.

As a mechanical engineer, Barr has worked with clients ranging from state port authorities and commercial

telecommunications firms to microelectronics and pharmaceutical manufacturers and the DOD.

"He's a quality leader," Sanborn says. "I trust my engineers and I trust Dave. I don't have to vote on every issue in a project — it just gets done."

Barr's experience with mission-critical facilities for commercial businesses and data centers applies well to military projects. For nearly 15 years, he was responsible for design and design-build projects for the U.S. military and other defense contractors, joining Burns & McDonnell in 2010.

"Dave does a great job of thinking through problems and understanding what's going on within a project," said Eric Putnam, a senior electrical engineer in the Burns & McDonnell Aviation & Federal Group. "His knowledge stretches way beyond his technical field."

Barr's experience combines with the company's established track record on electrical transmission projects and on-site power generation to give the firm an advantage over typical defense contractors.

"At Burns & McDonnell, we understand how the power infrastructure works, from power generation to consumption and all the steps in between," Barr says. "We are an integrated design-build firm bringing our clients beneficial experience every step of the way. I work with a very talented group of engineers, computer scientists and constructors. We've brought innovation and experience to develop solutions that didn't exist in the market."

Barr's team has applied that experience to the first two phases of the SPIDERS program. Phase II will be complete in October 2013. Phase III entails connecting the headquarters of the U.S. Pacific Command to a microgrid.

"Dave brings a significant amount of practical knowledge to our federal and DOD practice," Kraus says. "The unique solutions that Dave's team provided to the Navy in Phase I put us at the 'tip of the spear' for a program that has the momentum of the Pentagon behind it."

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