

***IPERC GridMaster® Supplies Microgrid Control System for Initial Phase of SPIDERS  
Microgrid Project***

**OVERVIEW**

The SPIDERS program focuses on the use of Smart Grid technologies, integration of renewable power generation, and energy storage, demand-side management, redundant power back-up, and protection from cyber threats to sustain mission-critical loads. SPIDERS represents the latest Joint Capability Technology Demonstration (JCTD) project involving the Department of Energy, Department of Defense (DOD) and Department of Homeland Security.

The objective of the SPIDERS JCTD were to demonstrate:

- To protect task critical assets from loss of power due to cyber attack
- Integrate renewable and other distributed generation electricity to power task critical assets in times of emergency
- Sustain critical operations during prolonged utility power outages
- Manage DOD installation electrical power and consumption efficiently, to reduce petroleum demand, carbon "bootprint," and cost

IPERC was selected to participate in each Phase of the effort which has increased in volume and complexity. Phase I, II, III equate to the crawl, walk, run approach to microgrid system development.

**SOLUTION**

Phase I was executed at Joint Base Pearl Harbor Hickam. For this effort, IPERC provided the power control management system for the waste water

treatment facility. The critical load ranges from 400 kW to 2.4 MW. The grid consisted of two diesels generators, 1600 kW and 800 kW which were independently operated with no redundancy at the start of project. We were also charged with integrating 170 kW of PV into the grid.

IPERC's control solution included:

- A community of Intelligent Power Controllers (IPCs)
- Human Machine Interface
- Graphical User Interface tailored to the facility microgrid
- Environmental enclosures

**RESULTS**

IPERC provided the power control management system that successfully completed a 72-hour Operational Demonstration.

- The control system achieved 30% fuel reduction and incorporated PV penetration exceeding 27% with no failures.
- The reduced consumption of diesel fuel reduced CO2 emissions by over 1,100 lbs., approximately a 42% reduction over the traditional mode of backup operation.
- Cybersecurity was verified with a high level of compliance with DoD 8500.2 and National Institute of Standards and Technology (NIST) SP800-82.
- The grid consisted of two diesels generators which could independently island or operate in parallel with N+1 redundancy

**Contact IPERC**

Discover how we can provide your business with the latest in microgrid technology.

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