

Intelligent Microgrid Solutions

Intelligent Microgrid Solutions satisfy power demands and guarantee energy and cost savings.

Critical operations need a dependable power system that ensures power is provided to their most significant loads during demanding conditions. Intelligent Microgrid Solutions provide an efficient, reliable and secure energy system that integrates existing power generation assets with new or existing renewable power sources and manages energy demands, whether connected or independent of a utility power grid. This power system will support mandates to improve energy efficiency, reduce greenhouse gas emissions, and increase the use of renewable energy, while reducing energy costs.

Efficient Energy Management

The Intelligent Microgrid manages power through central and distributed controls, seamlessly integrating with existing building/environmental power management systems when necessary. Distributed controls connect a variety of power sources, loads and even energy storage units onto a common network. The centralized controller optimizes the system to ensure the most efficient use of the distributed power resources. The overall control system design allows the microgrid to scale with a customer's needs and incorporate a diverse set of energy resources, including indigenous, renewable and nuclear sources, in order to maintain uninterrupted, high quality power.

Reliable Power Source

When faced with a power grid failure, attack or natural disaster, an Intelligent Microgrid ensures power quality is maintained, seamlessly transitioning from a grid-tied mode to an independent or "islanded" mode. Intelligent control technology can instantly analyze a power disruption and route available power to essential locations, enabling vital areas to remain operational. For customers connected to utilities, Intelligent Microgrids offer the ultimate in energy surety. For those who are not connected to a utility, microgrids offer reliable energy independence.



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Secure and Affordable Solution

A range of cyber security options is available to provide secure communications to, from and within the microgrid. Several financing options can be tailored to offer the microgrid's significant benefits at an affordable cost.

Applications

- Fixed (i.e., facilities, campuses, industrial sites)
- Remote (i.e., rural electrification, islands, forward operating bases)
- Mobile (i.e., first responders, disaster relief, deployable power)
- Nuclear (i.e., main control rooms, critical operations)

Features

- Centralized and Distributed Control
- Multi-Mode Operation
- Plug-and-Play Sources/Loads
- Flexible and Scalable Solution
- Secure Communications

Benefits

- **Scalable:** Plug-and-play integration of wide variety of sources and loads
- **Flexible:** Multi-mode options allow reconfiguration as assets or missions change
- **Fault Tolerant:** Seamless fault coordination and recovery
- **Intelligent:** Automated centralized and distributed control
- **Affordable:** Flexible financing options

Microgrid Development Process

Lockheed Martin's Microgrid Development Center provides a complete integration environment for simulated and Hardware-in-the-Loop testing of various microgrid architectures and associated control algorithms.

Customer Needs Assessment

- Surety/sustainability
- Reliability/improved service
- Efficiency/cost reduction
- Independent operations

Customer Choice

Site Survey

- Assets/load profiles
- Infrastructure
- Regulatory considerations
- O&M model

Proposed Microgrid Location

System Design & Modeling

- Controls
- Optimization algorithms
- Renewable energy integration
- Protection scheme

Microgrid Development Center

Simulation & System Test

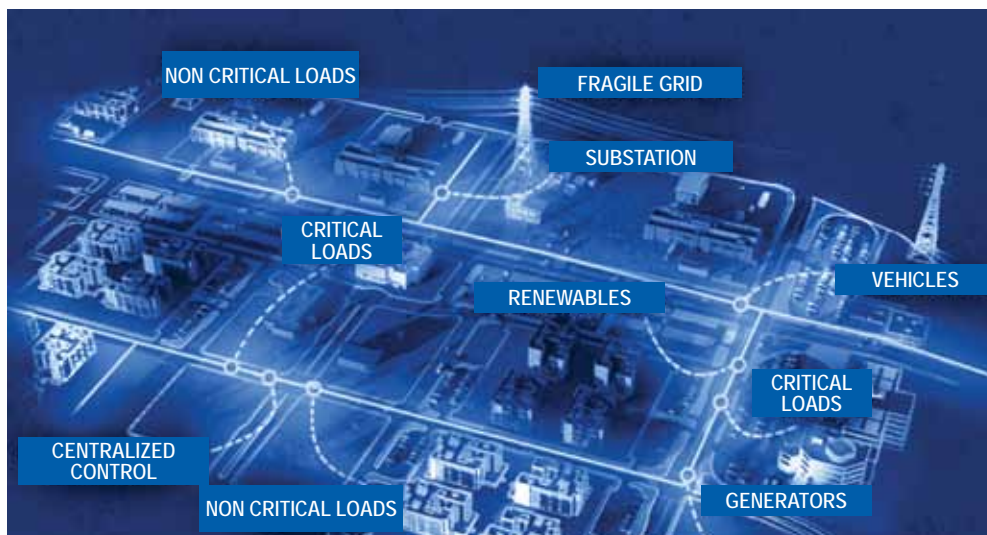
- Architecture and controls
- Hardware-in-the-loop testing
- Predictive performance

System Fielding

- Implementation
- Verification
- Commissioning
- Training/upgrades

Microgrid Location

*Complete System Solutions: Engineering to Construction
Risk Mitigation through Modeling, Simulation and Early Hardware-in-the-Loop Testing*



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