

“Race to Failure”
Energy Storage Program
Sprint/Nextel Shelters With iDEN[®] EBTS Systems

Emerson Network Power

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“Race to Failure” Problem Statement

- Wireless communication fails rapidly after commercial power loss
- Traditional energy storage (batteries) fail after several hours
- Failure mode involves rapid build up of heat within wireless shelters and enclosures
- Result: Temperature sensitive telecom electronics are forced to thermally shut down prior to depletion of on site energy storage
- Solution must address the following at the Telecom Site:
 - Lack of thermal energy storage (cooling)
 - Lack of extended DC power back up (batteries)
 - Leverage existing energy storage at site
 - Enhance site’s electrical and thermal storage capabilities to extend back up times up to 48 hours
 - Compete against traditional backup of diesels and air conditioning while remaining cost effective and environmentally attractive

“Race to Failure” Program Drivers

- Business Drivers
 - Market demands for uninterrupted telecom wireless service
 - Most all telecom sites are remote/unmanned solely dependant on lead acid battery technology
 - **180,000+ unmanned Wireless sites**
 - **270,000+ unmanned Wireline sites**
 - Cost and environmental concerns of diesel generators at all sites
- National Drivers
 - Federal acts, order and directives identify telecom and electricity as the most critical infrastructures
 - National and economic security dependant upon telecommunication
 - Recent events have shown electric grid is vulnerable to disruption, at a time when telecom is needed most!
- Sprint/Nextel recognizes the need to maintain the high reliability of their network and has partnered with Emerson on this program

“Race to Failure” Program Requirements

- Technical
 - Electrical and thermal energy storage must provide for up to 48 hours of continuous operation
 - Solution will be unique to industry, but draw from existing technologies
- Operational
 - High reliability, up to 10 years in the field
 - Non-Interruptible electrical and thermal energy storage
 - Must rely on existing fuels and infrastructure
- Financial
 - Low to Medium cost impact to end user
 - 5 year payback plan
- Environmental
 - Clean energy source
 - Low audible noise
 - Minimal overall impact

“Race to Failure”

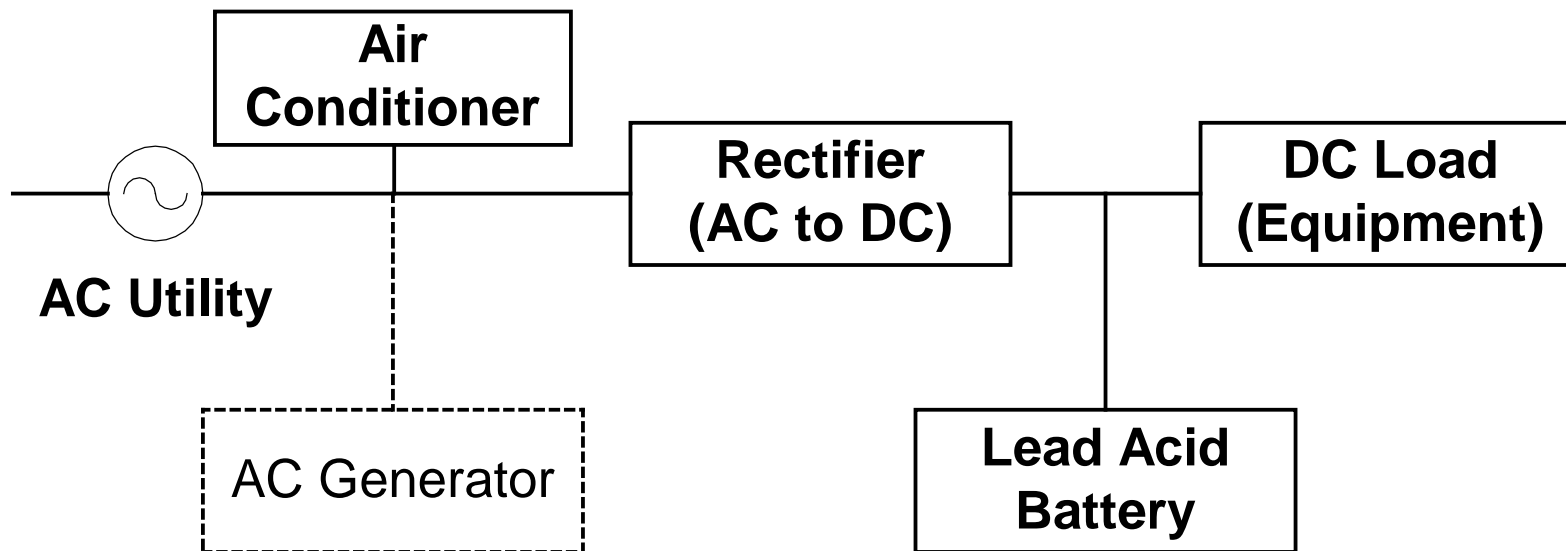
Overall Project Plan

- Overall Goal
 - Provide a cost effective, long term, electrical and thermal energy storage solution for new and existing remote telecom sites in order to raise the reliability of the current network with minimal environmental impact
- Time Frame
 - Goal: Installing, operating and evaluating beta unit of solution in 2007 calendar year
- Main Tasks
 - Develop test plan to reflect and monitor real world failure modes
 - Secure fully configured and fully functional Wireless Hut from Sprint/Nextel
 - Capture real world failure modes under a variety of environmental conditions and test scenarios

“Race to Failure” Overall Project Plan

- Main tasks – (continued)
 - Analyze data and develop a matrix of electrical and thermal storage solutions to alleviate identified failure modes
 - Identify and test most promising electrical and thermal storage solution with wireless hut provided by Sprint/Nextel
- Possible solutions
 - Air cooled system incorporating a DC power filtered vent system (Thermal)
 - Propane fired cooler (Thermal)
 - Hydrogen Fuel Cell (Energy Storage)
 - Combination or tiered approach to the above listed items

Standard Remote Terminal Powering Scenario



Standard telecom arrangement shown with optional AC generator

Thank you for your consideration