Project Manager Expeditionary Energy & Sustainment Systems

- Organizational realignment to reflect added Army visibility of Operational Energy
- Added Product Manager Force Sustainment Systems, Natick MA
  - Shelter Systems and supporting components (e.g., environmental controls)
  - Force Provider (small camp billeting and life support)
  - Field Feeding/Field Services
  - Cargo Aerial Delivery (parachutes)
- Added Product Director Contingency Basing Infrastructure, Warren MI
  - Optimum base design
  - Operational impacts (fuel, water, material supply)
  - Time-phased deployment/drawdown
- Additional synergy for expeditionary basing w/design, analysis, sources, loads, and shelters

Not just the PM for generators any more!

Update on Specific Projects

- Base Camp Integration Laboratory
- AMMPS Microgrid
- Industry Opportunities
Base Camp Integration Lab
Fort Devens, MA

• Rapidly assess and integrate new technologies, materials, and methods related to expeditionary basing in a realistic environment
• Active training site provides Soldier feedback
• Baseline and assessment 150 man camps side by side; fully instrumented
• PM support required for new equipment evaluations
• Evaluations to date include microgrids, insulating liners and shades, rigid wall shelters, shower water reuse, TRICON-based hygiene systems

AMMPS Microgrid

• Advanced Medium Mobile Power Sources family of sets from 5-60 kW, manufactured by Cummins Power Group
• All units have interchangeable Digital Control System (DCS)
• New software and CANbus connector added to standard DCS are only changes for microgrid capability; currently 30 and 60 kW models only
• New distribution boxes required to link 4-6 generators on common bus
• Distribution boxes contain contactors to isolate generators from bus when not operating
• Also added bus-connected battery chargers to system as set DCS are always “on”; also looking at battery charging algorithm to start sets
• Extensive fault analysis and fail-safe planning incorporated in controls (loss of comms, unexpected shutdown, improper setup, etc.).
• Goal is Soldier-proof

AMMPS 60 kW Microgrid

4x 60kW sets on M1061 5-ton trailers
Results After 60 Days

BEFORE: Self-powered ECUs; 12 generators with 315 kW installed
AFTER: 4 generators with 240 kW installed
- 1 mechanical failure (broken belt) without loss of power
- 33 instances of low fuel shutoffs, 1 loss of power
- Fuel savings estimated at 20-30%
  - Lack of real baseline data
  - Heavily dependent on environmental conditions (ECU load)
  - Changing layout/operations
- 513 Hours on 4 sets versus 2660 hours on baseline; 74% reduction
  - 3 week subset
  - Hour meters record DCS on, not actual power generation
- Maximum power observed ~158 kW; minimum power ~60 kW

Lessons Learned
• Automatic matching of generators to load can produce significant savings in both fuel and maintenance, given wide load variations
• Microgrid can significantly improve availability of power/grid robustness
• Extensive training required, especially in grid setup
• Training still insufficient for operators with no electrical background
• Future controls will incorporate start-on-warning vs start-on-fault
• Need to simplify connections and setup

Industry Opportunities
• Small Tactical Electric Power (STEP) Development and Production;
  - RFP in 2QFY15
  - 2kW and 3kW sets
  - Lighter, more efficient, more reliable
  - Remote start capability to enable hybrid systems
• Improved Power Distribution and Illumination Systems, Electrical (IPDISE) Development and Production; RFP in FY16
  - Updates of PDISE family, 400A to 40A distribution components
  - Multiple-input boxes to support microgrids
  - Possibly some level of intelligence for load shedding
• Advanced Medium Mobile Power Sources (AMMPS) Production Rebuy (build to print); RFP in FY16
  - 5kW, 10kW, 15kW, 30kW, 60kW family of generators
• Follow-on families of future power sources in the 2025 time frame
  - Army desires out-of-the-box solutions