USMC Okinawa Energy Demonstration Scoping Project

Out Brief
March 3, 2017
Scope Development Process

• Task 1 – Identify and prioritize 4 - 5 candidate project locations and associated demonstration concepts and objectives.

• Task 2 – Survey 4 - 5 candidate project locations/concepts and obtain initial site/facility data to assess needs/opportunities and revise prioritization and select top 2 – 3 candidate demonstration projects for next phase scoping and assessment.

• Task 3 – Develop conceptual level demonstration project scope and refined objectives for the top 2 - 3 most promising candidate locations.

• Task 4 – Assess the benefits and costs and feasibility of the selected candidate locations and select the top 1 – 2 demonstration projects for detailed planning

• Task 5 – Develop implementation plan(s) and recommendation for final demonstration scope, budget and schedule.
Selected Demonstration Scopes

Jungle Warfare Training Area (JWTC) – Main Compound
  – Renewable energy / microgrid demonstration

Foster Plaza Housing
  – Conservation voltage reduction demonstration
How does CVR Work?

• The amp draw of certain electric devices is proportional to the voltage used to energize the device.
  – These devices are called constant impedance or partial constant impedance loads.

• When the overall voltage on a distribution system is reduced, the current (and associated demand) of all constant impedance and partial constant impedance loads will decrease.

• Loads can be broadly characterized in three categories
  – Constant Impedance (Z) [Best]
  – Constant Current (I) [Moderate]
  – Constant Power (P) [No impact]

• With each load type demand varies differently as a function of voltage

  The amount of demand decrease per voltage reduced is called the CVR ratio. (%D/%V)
CVR Demonstration
CVR Demo Schematic
JWTC – Scope Concepts

Normal Operation (Grid Connected)
- Renewable PV energy reduces commercial power purchases

Emergency Microgrid Operation (Islanded mode)
- Networked and optimized PV/diesel hybrid generation microgrid to support energy sustainability, security and extended contingency operations.
- Generator paralleling and load sharing and added efficiency opportunities (e.g. DC power system) to maximize fuel efficiency extending islanded operation
- Redundant generation resources via the networking of multiple generation resources
Detailed design questions to be answered
- What loads should be included?
- What is the load profile for the critical loads?
- Can generator controls be upgraded or are new generators needed?
- If new generators are needed is it better to use just one larger new one?
- DC microgrid opportunities?
Mahalo!
(Thank you)

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