FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

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Building Resilience at Marine Corps Base Camp Lejeune

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Hosted by:

FEMP
Federal Energy Management Program

EEI
Edison Electric INSTITUTE

Why the Marine Corps Pursues UESCs

DUKE ENERGY®
BUILDING A SMARTER ENERGY FUTURE℠

- **Long-term relationship between installation and utility**
  - Knowledge of critical infrastructure and planned future growth
  - Understands how new projects can impact the installations (e.g. tariff rates, departing loads, stand-by charges)
  - Communicates/shares what Public Utilities Commission (PUC) is promoting (e.g., storage and renewable energy incentives)
- **Understands the health of our infrastructure**
  - Awareness of aging distribution systems (electric, gas, steam, water)
  - Able to identify single points of failure, overloaded circuits, sub-station and switching station degradation
- **High speed of execution**
  - UESCs are a faster process than traditional government programming or other 3rd party financing options

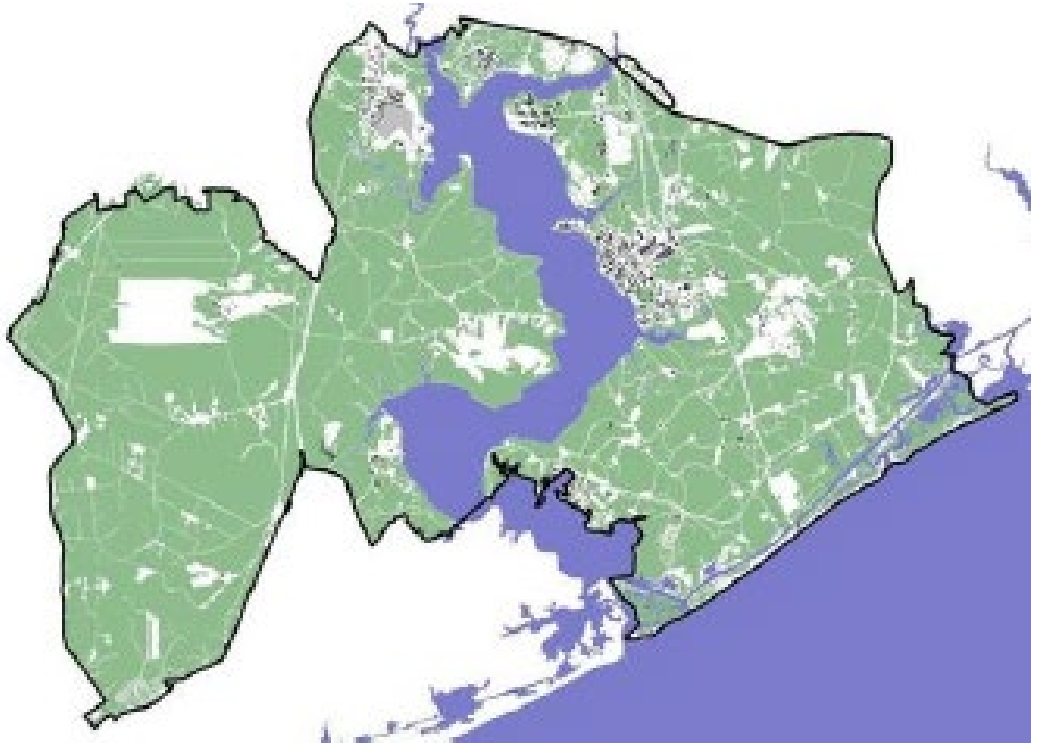
How the Marine Corps Uses UESCs

- **Comprehensive approach that looks at the total bundle, not just single Energy Conservation Measures (ECMs)**
- **By utilizing savings from all ECMs, UESCs address both the routine and the difficult:**
  - **Standard ECMs with <20 year Simple Paybacks : HVAC, boilers, controls, water, lighting, etc.**
  - **Challenging ECMs with longer paybacks: renewable energy, storage, etc.**
  - **Improvements w/ difficult to quantify paybacks: microgrids, utility upgrades, etc.**
- **UESCs solve several contract / financial challenges:**
  - **Ability to combine funding sources**
  - **Option to pay off of the balance early**
  - **Can make changes to the Scope of Work without having to re-advertise**

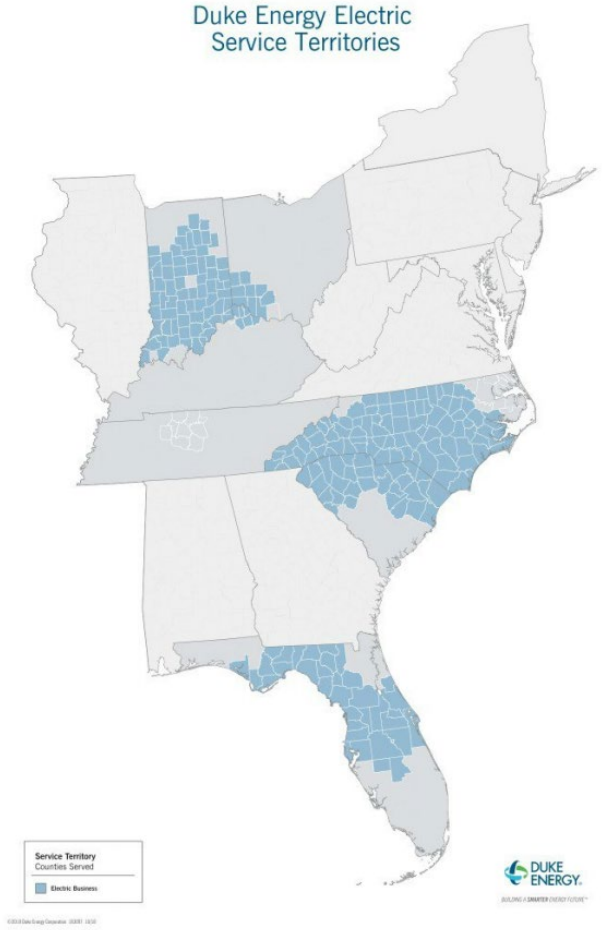

CHINA
N. KOREA
S. KOREA
JAPAN
MCAS Iwakuni
MCB Camp Mujuk
Camp Fuji
CANADA
UNITED STATES
MEXICO
MCMWTC Bridgeport
MCLB Barstow
MCAGCC Twentynine Palms
MCB Camp Pendleton
MCAS Camp Pendleton
MCAS Yuma
MCAS Miramar
MCRD San Diego
MARBKS Washington DC
MCAF Quantico
MCB Quantico
MCAS Cherry Point
MCB Camp Lejeune
MCAS New River
MCLB Albany
MCAS Beaufort
MCRD Parris Island
MCSF Blount Island
Okinawa
MCB Camp Butler
Camp Schwab
Camp Hansen
Camp Courtney
Camp Foster
MCAS Futenma
Camp Kinser
MCB Hawaii
Hawaii
N
W
E
S

Marine Corps Base Camp Lejeune

- 156,000 acres/244 sq. miles (roughly the size of Chicago)
- 50,000 active duty
- Electrical distribution
  - 5 substations
  - 400 miles of distribution
- Water and wastewater treatment
  - 4 water treatment plants
  - ~150 lift stations
  - ~80 wells
  - wastewater treatment plant
- >2,000 facilities



Duke Energy Service Territory



Main Resiliency Requirements

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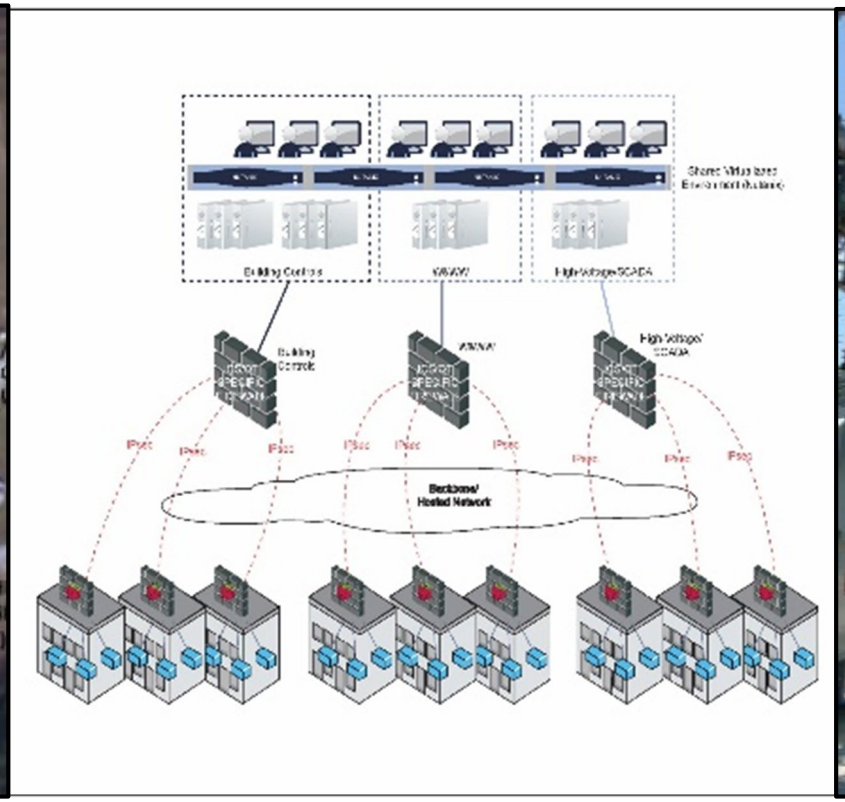
1. Water and Wastewater SCADA

2. Building Controls



3. High Voltage Upgrades and SCADA

What's Included in the $100M Project Package

Energy Conservation Measures (ECMs):

- Modernization of Water/Wastewater SCADA system, replace & upgrade mixing & UV systems
- Conversion of Lift Stations to Gravity Flow
- Electrical Substation Upgrades / Replacement
- EMCS system - HVAC and Boilers
- Airfield Lighting conversion / upgrades
- Utility Metering/AMR Enhancements
- Building Automation System (BMS) Integration for HVAC and Utility-Grade Boiler, Optimization of HVAC Controls
- Photovoltaic Optimization
- LED Lighting Conversions
- More

Lessons Learned

1. Partnership:
   - Think holistically and long-term
   - Work with utility to develop needs into projects
2. Communication:
   - Constant communication is key
     - Kick-off charrette, weekly technical meetings, biweekly management meetings
     - Prioritize resilience needs
3. Acquisition Strategy:
   - Leverage existing funding to buy-down
   - Bundle, bundle, bundle for project maximization!
4. Adaptability:
   - Previous decentralization project

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