Utilities Privatization

Hosted by:

FEMP
Federal Energy Management Program

Dominion Energy
Dominion Energy

Federal Partnerships

– Regulated Service Provider (Gas & Electric)
– Utilities Privatization
– UESC

Our Model for Success

The role of Energy Efficiency
Overall, Dominion Energy provides electric service to over 300 critical federal sites.
Privatization Partners

Fort Belvoir
Fort Myer
Fort McNair
Henderson Hall
Arlington National Cemetery

Fort Lee
JBLE - Eustis
JEB Little Creek – Fort Story (Fort Story)
Fort Hood – Gas and Electric
Fort Jackson
An efficient installation that achieves a Reliable, Resilient, and Sustainable energy supply from power generator to end user by incorporating a diverse set of energy solutions in an integrated and optimal way.
Implementation Results

>80% Reduction in outages

>90% Reduction in outages

Reduced outages by 37% while supporting $1.2B in post BRAC construction

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ESTCP – CVR, Radnor Heights Substation
JBMHH-ANC Key Initiatives

Reliability and Resilience
• Replacement of aging infrastructure
  • 1960s vintage switches and transformers
  • Failing duct bank system
• Regulated substation on Fort Myer property to reduce circuit exposure
• High Reliability Distribution System (HRDS) at Fort McNair – high speed fault isolation and load transfer
• Substation maintenance
• System coordination upgrades

Efficiency
• Fort Myer - Conservation Voltage Reduction/MicroCVR (ESTCP Project)
• UESC project to reduce energy consumption
• LED Outdoor Lighting

Sustainability
• DE owned microgrid at mission critical facility
• DE owned emergency back-up generation at critical facilities
Results

JBMHH-ANC 10 Year Outage History

96% Reduction in Outages
Dominion Energy

Focus on Resilience and Sustainability

Efficiency Plays a Key Role

Utilize All Available Tools

– Partnerships with Regulated Utility
– Utilities Privatization
– Innovative Offerings
– UESC
Conservation Voltage Reduction

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Dominion Energy
Conservation Voltage Reduction

Energy Consumption follows Voltage

• Electricity delivered to customer’s meter required to be within 114V – 126V.

• Delivering voltage in the lower half of the band provides energy savings to the utility and to all customer classes with no change in behavior.

• AMI systems providing near real-time voltage provides new information allowing control systems to precisely control voltage to maximize savings and reliability.

\[
\text{Energy} = \text{CVR Factor} \times \text{Voltage}
\]

Higher customer voltages result in higher usage and bills.

Voltage optimization will reduce incoming voltage leading to lower electricity usage and customer savings.
## Voltage Reduction Use Cases

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation Voltage Reduction 24x7 (Volt/VAR Optimization)</td>
<td>Reduce installation's energy by 2%-4%</td>
</tr>
<tr>
<td>Demand Voltage Reduction (DVR) - beat monthly peak each month</td>
<td>Each MW of peak use reduced may be worth between $10K - $20K monthly depending on market specifics</td>
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<tr>
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<td>Demand Voltage Reduction (DVR) - Ratcheted rates</td>
<td>Annual peak sets demand rate for year Average of summer peaks set transmission COS for year (TX only)</td>
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<tr>
<td>Voltage Stabilization</td>
<td>Enhanced reliability and increased solar PV hosting capacity</td>
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AMI Based Voltage Control

**Advantages**
- Direct visibility of voltage at all customers
- Extremely cost effective if AMI is already in place (low LCOE)
- Maximum savings potential versus other approaches

**Disadvantages**
- Requires AMI (Smart Meters or Sensor)

Dynamic Bellwether
AMI Voltage Feedback
# Fort Myer Performance

**EW-201519: Utilization of Advanced Conservation Voltage Reduction (CVR) for Energy Reduction on DoD Installations**

<table>
<thead>
<tr>
<th>Performance Objective</th>
<th>Metric</th>
<th>Data Requirements</th>
<th>Success Criteria &amp; Result</th>
<th>Final Performance Update</th>
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<td><strong>Quantitative Performance Objectives</strong></td>
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<td>Site-wide conservation voltage reduction (CVR)</td>
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<td>Meter readings of energy used by DEV at Fort Myer master meter delivery point</td>
<td>3% reduction compared to baseline</td>
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<td>On-site Base Manager receives notification</td>
<td>Zero customer complaints</td>
<td>1 customer issue was reported on July 17. Investigation into customer equipment underway by DPW engineering team.</td>
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<td>No Impact to Base Security</td>
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FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

November 7-8, 2018
Herndon, VA

Thank you

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USCG Portsmouth - UESC

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Dominion Energy®
Base Portsmouth

Federal Facility - U.S. Coast Guard Base Portsmouth, Virginia

United States Coast Guard
- One of 5 Armed Services
- Dept. of Homeland Security
- Responsible for maritime safety, security and environmental stewardship of US ports and waterways

Facility
- Built 1969-1972
- 437,000 SF of buildings
- 187 Acres
- 2,100LF wharf at waterfront
- 2- 660FT piers
- 26+ Tenants & Detachments
- 10 Major Cutters
- 1700 personnel
USCG Base Portsmouth UESC

U.S. Coast Guard, Dominion Energy Virginia & Energy Systems Group

Comprehensive set of ECMs
• ECM 1 Natural Gas Conversion
• ECM 2 Lighting Upgrades
• ECM 3 Peak Shave Generator
• ECM 4 Water Fixture Upgrades
• ECM 5 Retro Commissioning
• ECM 6 Microgrid Feasibility Study
• Mod 1-2 Main electrical switchgear bypass and replacement

Project Benefits
• Environmental Improvements
• ~$9.5 million investment
• ~$750,000 in annual savings
• ~33% energy savings
• Microgrid study
• Award winner
Partnership & Lessons Learned

Engineering:
- 10+ years of planning efforts - ESPC vs UESC
- Software controls compatible in Paint Bay Booths
- Lifecycle cost analysis – maintenance
- Partnership with other utilities – sometimes competitors

Construction:
- Density of existing underground utilities
- Coordination with local school schedule for tie-in
- Passing the point of no return for 2016/17 heating season
Strategic Accomplishments

- USCG Portsmouth transitioned an environmental liability into capability
  - Phase I – Microgrid Plan + Energy Conservation Measures (manual)
    - Success defined as removing diesel fuel tanks plus modernizing feeders & switchgear
  - Phase II – Uninterrupted load sequencing (auto)
  - Phase III – Renewable generation for non-critical loads (stored)
- Planned for resiliency and redundancy **up front**
- Natural gas commodity now on base
- Self-financed Phase I work
  - paid through ~ $750K annual savings
- 20% reduction in electricity use
- 33% reduction in total energy costs
Questions

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