## FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

November 7-8, 2018 Herndon, VA

# **Utilities Privatization**

Hosted by:



Federal Energy Management Program



# **Dominion Energy**

- Federal Partnerships
  - Regulated Service Provider (Gas & Electric)
  - Utilities Privatization
  - UESC
- **Our Model for Success**
- The role of Energy Efficiency



### **Energy Partners to Mission Critical Facilities**



Naval Station Norfolk



Fort Belvoir



Pentagon



Norfolk Naval Shipyard



Joint Base Langley - Eustis



MCB - Quantico

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









# **Base of Tomorrow Blueprint**

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



> 80% Reduction in outages





>90% Reduction in outages 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**





# **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



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## **Conservation Voltage Reduction**

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# **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.



Maximum Allowed **Higher customer** Voltage voltages result in higher 126V usage and bills. 120V Nominal Voltage Voltage optimization will reduce incoming voltage leading to lower 114V electricity usage and customer savings.



## **Voltage Reduction Use Cases**

Use Case	Value	
Conservation Voltage Reduction 24x7 (Volt/VAR Optimization)	Reduce installation's energy by 2%-4%	
Demand Voltage Reduction (DVR) - beat monthly peak each month	Each MW of peak use reduced may be worth between \$10K - \$20K monthly depending on market specifics	
Demand Voltage Reduction (DVR) - beat G&T/ISO/RTO Coincident peak	Each MW of peak use reduced worth \$10K - \$20K each month depending on market specifics	
Demand Voltage Reduction (DVR) - Ratcheted rates	Annual peak sets demand rate for year Average of summer peaks set transmission COS for year (TX only)	
Voltage Stabilization	Enhanced reliability and increased solar PV hosting capacity	



## **AMI Based Voltage Control**



- 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)





## **Fort Myer Performance**



#### EW-201519: Utilization of Advanced Conservation Voltage Reduction (CVR)

#### for Energy Reduction on DoD Installations

Performance Objective	Metric	Data Requirements	Success Criteria & Result	Final Performance Update	
Quantitative Performance Objectives					
Site-wide conservation voltage reduction (CVR)	Energy - kWh	Meter readings of energy used by DEV at Fort Myer master meter delivery point	3% reduction compared to baseline <b>Result: 3.7% reduction</b>	Energy savings Measurement & Verification (M&V) in process. Voltage reduction ranges from 2.4% – 5.0% below historical average over winter period and 4.5% to 5.5% during the summer period.	
Qualitative Performance Objectives					
No Operational impact to primary tasks	# customer complaints	On-site Base Manager receives notification	Zero customer complaints Result: 1 issue reported	<ol> <li>1 customer issue was reported on July</li> <li>17. Investigation into customer</li> <li>equipment underway by DPW</li> <li>engineering team.</li> </ol>	
No Impact to Base Security	# incidents	On-site Base Manager receives notification	Zero incidents Result: 0 issues reported	Zero incidents have been reported over project performance period.	



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# Thank you



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# **USCG Portsmouth - UESC**

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## **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



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### Public-Private Partnerships

Contract Award (Sept 2015)





# 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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