Department of Navy’s Energy Security Framework: How it Relates to Utility Providers that Support Navy and Marine Corp Installations

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DON Energy Security Framework

3 Pillars of Energy Security (P-602)

**Reliability**
The percentage of time energy delivery systems (utilities) can serve customers at acceptable regulatory standards.
- Outage Duration
- Outage Frequency
- Availability
- Power Quality

**Resiliency**
The ability to avoid, prepare for, minimize, adapt to, and recover from energy disruptions.
- Backup Generation
- Uninterruptible Power Supply
- Power/Fuel Storage

**Efficiency**
The use of the minimum energy required to achieve the desired level of service.
- Metering
- Audits
- Intensity Reduction

ESF sets the requirements for installations energy investments
**Resilience Affordability – Load Prioritization**

**Prioritized Load Concept**
1. **DOD Mission Assurance**
2. **Service critical (Navy/USMC mission)**
3. **UFC Required** (hospitals, police, fire, etc.)
4. **Support facilities** (housing, MWR, etc.)

*Working to better define these in order to estimate costs of resilience / sustainment*
ESF Implementation

Energy Mission Integration Group (EMIG) Processes

1. Gap Analysis

2. Solutions Development

3. Project Prioritization

3 Pillars Benchmarks (Reliability, Resiliency, Efficiency), Mission Assurance Assessments, Utility Condition

All technologies, local & regional resources, Business Case Analysis

Installation Priority, mission impact, urgency, ROI
Installation Energy Plans

Guiding Principles

- Warfighting missions first
- Essential Support functions
- Metrics-based assessment
- Mission-based prioritization
- Integrate cyber security
- Synchronize projects
- Leverage 3rd Party Financing when appropriate
- Technology-agnostic reqts
- Diverse and distributed energy resources
- Lifecycle cost analyses

SET REQUIREMENTS
Mission Assurance, P-602, UFC, BFR

ASSESS STATUS
ESAT, UICAP, MIT/LL, UA

PRIORITIZE & PLAN
EMIG, IPL, IEP, POM

EXECUTE
APF, ESPC, UESC, UEL, Outgrant, PPA

Off Base Generation
Privatized Housing and Solar
Load Following Generation
Critical Facilities on Cyber-Secure Microgrid
Non-Critical Circuit
Grid-Integrated Battery Storage
Critical Circuit Microgrid
Community Interface
Solar

Assistant Secretary of the Navy
(Energy, Installations & Environment)
Navy Utility Reliability Pillar Improvement Initiatives

• Navy Reliability Information
• Navy Utility Infrastructure Condition Assessment Program (UICAP)
• Navy Utility Condition Assessments
• Navy’s Utility Investment Strategy
• Utility Privatization Status
• Key Takeaways
Utility Reliability Information including Navy – EIA Average SAIFI/SAIDI

Average electric power service interruptions per customer by utility type, 2015

- **Navy median**: 1.95
- **Navy median**: 432
Navy Utility Infrastructure Condition Assessment Program (UICAP)

• **Purpose:** Identify the State of the Navy’s Utility Infrastructure Assets
• **Program Development:** FY13-FY16
• **Primary Objectives:**
  – Conducted Utility Equipment *Inventory* and Condition *Assessment*
  – Integrated data into Navy’s legacy information systems (MAXIMO/iNFADS/GIS)
  – Conducted Risk *Evaluation* and Developed Risk-Based *Investment* Plan
  – Developing a Comprehensive Preventive Maintenance Program

• **Risk Evaluation Considerations:**
  – Consequence of Failure of Asset
  – Likelihood of Failure of Asset

• **Risk-Based Investment Decisions:**
  – Convergence between Risks associated with Consequence of Failure and Likelihood of Failure of NWCF Utility System Asset
Navy Condition Assessments

<table>
<thead>
<tr>
<th>Type of Utility</th>
<th>Total #</th>
<th>Replacement Value (PRV)</th>
<th>% PRV</th>
<th>AVG CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiller Plant &amp; AC</td>
<td>51</td>
<td>$0.40B</td>
<td>2%</td>
<td>78</td>
</tr>
<tr>
<td>Electrical Power</td>
<td>3,896</td>
<td>$9.15B</td>
<td>51%</td>
<td>75</td>
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<tr>
<td>Gas</td>
<td>502</td>
<td>$0.22B</td>
<td>1%</td>
<td>78</td>
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<tr>
<td>Waste Water/ Sewage</td>
<td>2,754</td>
<td>$2.96B</td>
<td>16%</td>
<td>76</td>
</tr>
<tr>
<td>Steam/ Hot Water</td>
<td>682</td>
<td>$2.36B</td>
<td>13%</td>
<td>79</td>
</tr>
<tr>
<td>Water</td>
<td>2,336</td>
<td>$3.03B</td>
<td>16%</td>
<td>75</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>10,221</strong></td>
<td><strong>$18.12B</strong></td>
<td><strong>100%</strong></td>
<td><strong>76</strong></td>
</tr>
</tbody>
</table>

Utility Systems Condition Assessment Summary

- 54% of ALL Utility assets: Failing (8%) or Poor (46%) Condition
- 51% of Electrical Power assets: Failing (10%) or Poor (41%) Condition
- 61% of Waste Water/ Sewage assets: Failing (4%) or Poor (57%) Condition
- 62% of Water assets: Failing (8%) or Poor (54%) Condition
- 48% of Steam/ Hot Water assets: Failing (6%) or Poor (42%) Condition
Navy’s Utility Investment Strategy

- Top – Down Driven based upon Programmatic Strategic Intent
- Risk-Based focused on Probability and Impacts of Utility System Failures
- Navy following established governance to effectively prioritize Utility Systems Infrastructure Investments
- Targeting Highest Risk Areas by End of the FYDP (FY24):
  - Electrical, Water and Wastewater Systems
  - Naval Shipyards Utility System Infrastructure
- Utilize Utilities Privatization to help support “Investment Gaps”

Projected Utility Systems Investment Distribution

- Electrical: 40%
- Wastewater: 25%
- Water: 30%
- Other: 5%

Projected Condition (CI) Degradation

- Planning for 2.4 point drop in FYDP
- Condition: 76.0 to 73.2
Utilities Privatization was mandated by Presidential EO 12803 of April 30, 1992. The Navy privatized 32 systems 1992-2015 under this EO, which has now expired. Legislative Authority Title 10 USC Sec 2688 still in effect.

Navy Privatization Efforts

- Waste Water, 146 Systems, 29%
- Electric, 139 Systems, 27.5%
- Water, 139 Systems, 27.5%
- Natural Gas, 63 Systems, 12%
- Thermal/Steam, 14 Systems, 3%
- Comp Air, 4 Systems, 1%

*Note: Of the 58 Privatized Systems only 32 are privatized under USC 2866
Key Takeaways

- Energy Security is a top priority for DoN
- Future energy investments will be prioritized based on mission requirements for reliability and resiliency
- Navy utilizes a comprehensive Utility Infrastructure Condition Assessment Program that identifies Asset Condition, Relative Risks and Impacts on Navy Mission
- Higher Navy mission priorities over the years have led to continued underfunding for Utilities Systems Infrastructure
- Navy has a Targeted Risk-Based Investment Strategy to ensure critical missions are supported
- UP may help to resolve gaps with DoN utility capabilities, but will only be used if business case shows it is the best value solution
Questions

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