Department of Defense
Installation Energy Resilience

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Acquisition, Technology and Logistics

DoD Energy Resilience (ER)

Policy Drivers

- Multiple requirements through FY2017 NDAA;
- DoD Instruction 4170.11 (updated 16 Mar 2016), Installation Energy Management, Energy Resilience
- Title 10, Section 2925(a) (modified thru FY2016 NDAA);
- ASD(EI&E) Memorandum on Power Resilience;
- Unified Facilities Criteria (such as Electrical Series)

DoD Policy Initiatives

- DoDI 4170.11 change on energy resilience (complete)
  - Ensures performance against existing requirements
  - Encourages cost-effective solutions to improve mission assurance
- Implementing guidance
  - Operations, maintenance, and testing (OM&T) (complete)
  - Energy resilience, mission integration, metrics (in-progress)
- Budgetary execution
  - Business case analyses (BCA) framework (MIT-LL) to prioritize budget resources or alternative financing projects for energy resilience (complete)
  - Rating alternative financing projects to accelerate adoption of energy resilience projects – Defense Energy Resilience Bank (DERB) (in-progress)

DoD energy resilience is the ability to prepare for and recover from energy disruptions that impact mission assurance on military installations.
A = Availability – What’s my current risk/planning profile to pursue base-level projects (e.g., outage planning factors that will guide my scenario modeling)?

Installation energy resilience needs could include:
- Information related to availability of delivered power, and other system reliability metrics for planning purposes
- Continued prioritization understanding for collaboration and planning of emergency response activities

There is no requirement in our installation energy resilience framework to pay a “premium” or “tariff” for additional delivered power to the installation, given we are prioritizing critical loads on our military bases and that resilience assumes disruptions have occurred on the commercial electric grid. Guidance does encourage inclusion of appropriate reliability savings, and tariff & security savings/cost avoidance in life-cycle cost analysis (LCCA).
Inclusion of Mission-Based Decision-Making

Energy Resilience Overview

Overview

Critical Mission Operations (Sample - For Training Purposes Only)

<table>
<thead>
<tr>
<th>Services and Defense Agency provided during Power Resilience review in 2014</th>
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<tbody>
<tr>
<td>Validated through MIT-LL was the need for broader and strategic energy resilience framework, inclusive of:</td>
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<tr>
<td>- Service and Defense Agency Warfighting Missions</td>
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<tr>
<td>- Emergency, Recovery, and Response Missions</td>
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<td>- Supporting Installation Infrastructure (those needed based on outage risks and interdependencies)</td>
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Step 1 – Criticality of mission and supporting functions

- Important questions:
  - Mission operator coordination?
  - Were mission dependencies evaluated?
  - Were mission-to-mission solutions reviewed and identified?
  - Were risk-based mission requirements developed and considered?
  - Is an infrastructure solution required or needed?

Step 2 – Mission requirements of those critical mission operations

- In terms of ‘resilience’ – what disruption risk is appropriate? (e.g., availability, downtime, etc.)

DoDI 4170.11 requires alignment to critical mission operations and expanding solutions beyond standby generators.

Resilience allows for a comprehensive, strategic framework and extends beyond traditional “building-by-building” or “generator-by-generator” designation for resilient designs. Important to establish a holistic and strategic resilience framework that integrates mission and installation stakeholder communities that encourage mission-based decision-making.
Example Case – Not an actual installation

- OM&T and right-sizing (generators)
- Consider upgrading/improving distribution system, equipment, and fuel for critical loads (not typically industry system standards – but mission-based standards)
- Consolidated/distributed generation at the critical feeder on the base
- Spot generators/UPS at specific critical facilities could still be required
- Essential to ensure mission-specific security requirements are met (resilience requirements allows for lower surface area protection)

A = Availability – Is the availability at my critical loads in alignment with what my mission requires?

Current authorities were developed for alignment to industry, not mission-based metrics and standards.

Generally, this was found to be a good option to improve resilience affordably (MIT-LL study).

- Renewable energy options can also be considered to help offset fuel related costs and vulnerabilities (however, batteries beyond UPS generally difficult to support thru LCCA)
- Typically, we look at “fixed” energy systems – evaluation of flexible options (e.g., duel-fuel) and even mobile generation (lowers vulnerability surface area further)