DoD Installation Energy Resilience

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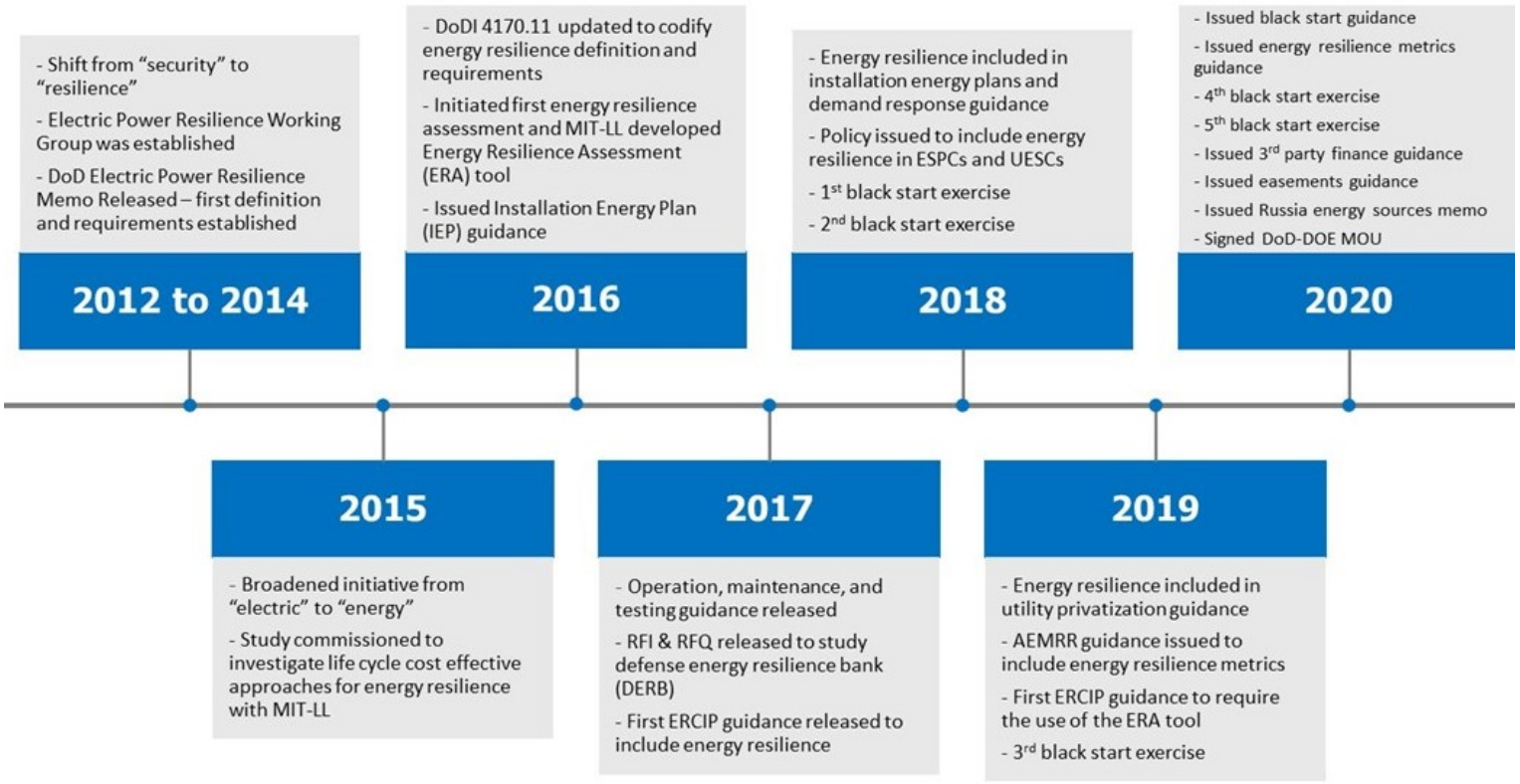
Installation Energy Resilience Website:
http://www.acq.osd.mil/eie/IE/FEP_Energy_Resilience.html
Details on Energy Reports:
https://www.acq.osd.mil/eie/IE/FEP_Energy_Reports.html

DoD Energy Resilience (ER) Program Timeline



Energy resilience policies and capabilities align to national security and mission requirements

Key enablers to ER Program:

- **DoDI 4170.11 Energy Resilience Policy**
- **Installation Energy Plans (IEPs)**
- **Black Start Exercises**
- **Alternative Finance**

FY18-FY21 NDAA (Snapshot)

FY18 NDAA

- 10 USC Section 101(d) – Energy Resilience Definition
- 10 USC Section 2688 – Utilities Privatization: UP contracts include ER requirements and metrics; ER performance reporting in the annual energy report for UP contracts
- 10 USC Section 2911 – Energy: codifies Energy Resilience in policy to ensure the readiness of the armed forces

FY19 NDAA

- 10 USC 2911(c) is amended to include language to report energy resilience goals
- 10 USC 2925(a) revised to require multiple energy resilience reporting
- 10 USC Section 2922(a)(d) requires prioritization of energy security and resilience in power purchase agreements

FY20 NDAA

- SEC. 2874. Required black start exercises at 3 military installation (1 required at a Joint Base)
- Codified a definition for black start exercises

FY21 NDAA *(pending final passage)*

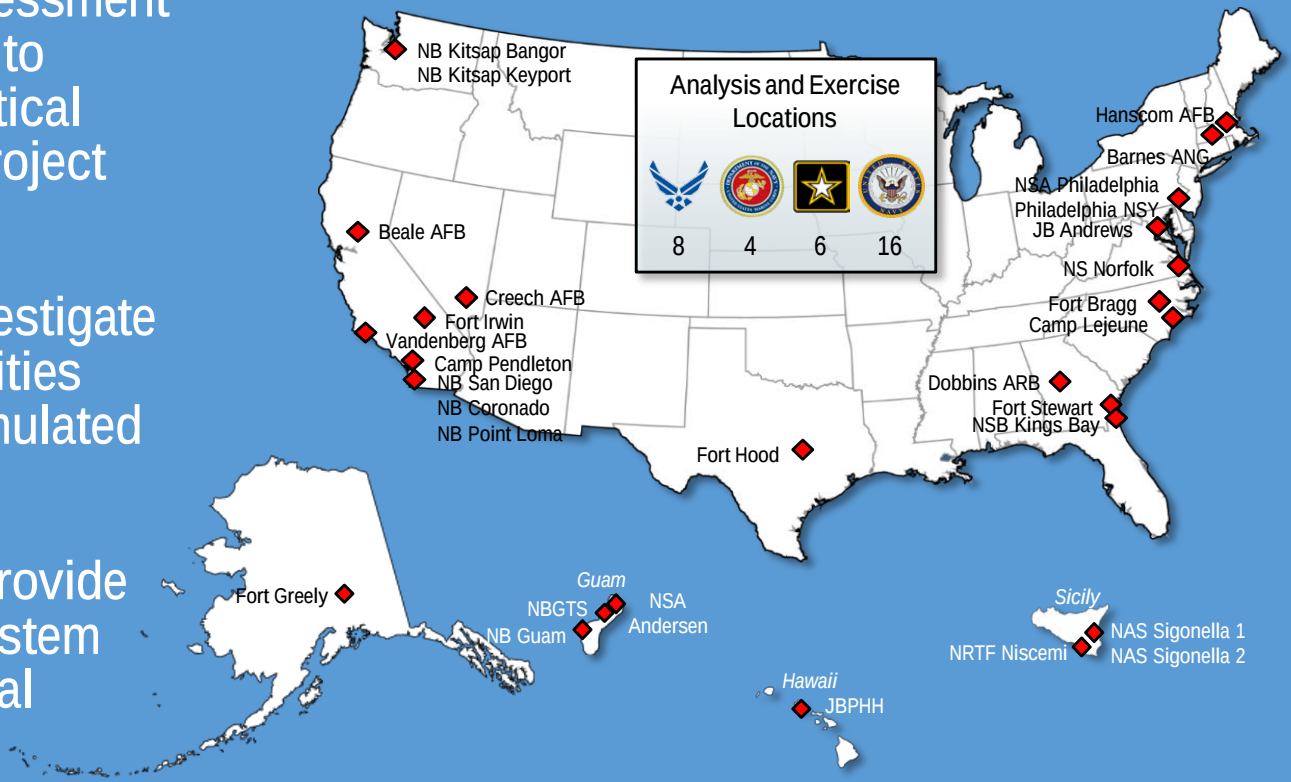
- Defines availability metrics for critical energy loads (99.99 to 99.9999 availability)
- Defines critical missions
- Expands annual requirement for black start exercises to five per Military Department

DoD Energy Resilience

Tools, Assessments and Exercises

Acquisition & Sustainment

- Energy Resilience Assessment (ERA) tool allows sites to understand risks to critical systems and inform project development
- Tabletop exercises investigate responses and capabilities during an extended simulated outage
- Black start exercises provide awareness of actual system capabilities during a real outage



>30 energy resilience base assessments and exercises completed

- *~1/5 of the Department's electricity consumption*
- *> $450 million in electricity costs*

- Adverse weather events are damaging our electrical infrastructure
- Downstream effects may cause outages on DoD installations
- Real-world exercises ensures preparedness for an outage scenario

Black Start Exercises

Acquisition & Sustainment

- DoD exercises and tools are driven by user / base requirements
- Tests existing energy resilience and backup systems on full operational load (i.e., microgrids, generators, UPS, fuel, etc.)
- Black start exercises assess performance of electric power infrastructure and provide numerous benefits
- Project opportunities and actions from exercises to ensure resilience
- Next step is to integrate cyber into black start exercises

Black start exercises are driven by national security and mission requirements

Similar to findings from ERA tool and assessments

Sample Integrated ER Projects

Energy Resilience Assessment (ERA) Tool

Acquisition & Sustainment

- Consolidated generation at the substation / critical feeder level
  - Large emergency diesel generators or natural gas cogeneration with dual fuel capability
  - Improvements in infrastructure for a reliable distribution system on the base requires consideration
  - Reduces the maintenance burden on base personnel and could improve the reliability to operate during an outage
- Solar PV through alternative financing could (in the appropriate region) provide electricity to the installation at below market rates
  - For islanded operation the appropriate inverter functionality and costs would need to be considered in requirements
  - Potential to offset fuel requirements during grid outages (technical and cost tradeoffs must also be considered)
- Installation of targeted microgrids at identified critical loads could improve resilience
  - Must consider technical and economics of incorporating additional infrastructure

All ERA tool, assessments, and project recommendations driven by national security and mission requirements

ERA tool required for ERCIP investment decisions

Summary

- Policy and requirements
  - Sustained policy focus over the course of many years
  - Shift focus to execution, funding, and resourcing policy and requirements
- Implementing installation energy resilience
  - Holistic energy planning through IEPs
  - Identify energy resilience gaps and vulnerabilities
    - Black start exercises, energy resilience assessments, etc.
  - Program and fund mitigation actions to close gaps
    - Prioritize military construction and O&M appropriations
    - Leverage alternative financing for energy resilience project development
  - Measure and verify sustained energy resilience
    - Metrics and standards
    - Verify success by continuous and sustained exercises and assessments