



# Navy Energy Security Metric Development and Evaluation

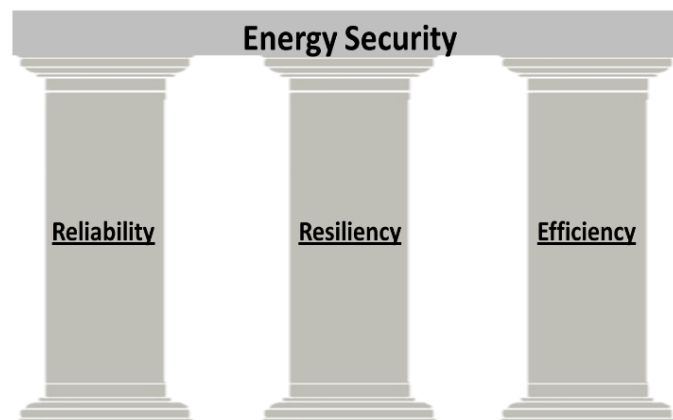
Energy Planning for Resilient Military Installations

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# ESF Background

- Focus has changed from energy conservation and renewables to:
  - Comprehensive and integrated Energy Security Framework (ESF)
    1. Benchmark installation energy security performance
    2. Assess installation performance against benchmarks
    3. Prioritize energy security improvements based on gap analysis
- Implementation of ESF is the foundation for DON's execution of directives from Congress and DoD
- Benchmarks established in NAVFAC 3 Pillars of Energy Security (P-602) and the Energy Security Assessment Tool





# Reliability Benchmarks



Primary Threshold	Threshold Reference
Is Installation Commercial SAIDI $\leq 60$ (Shipyards*) or $\leq 120$ (Non-Shipyards)?	EIA 2015; IEEE Standard 1366; P-602
Is Installation Commercial SAIFI $\leq 1$ (Shipyards*) or $\leq 2$ (Non-Shipyards)?	EIA 2015; IEEE Standard 1366; P-602
Does the Installation have $> 1$ commercial electric feeder lines supplying the Main Base?	
Is Installation internal SAIDI $\leq 60$ (Shipyards*) or $\leq 120$ (Non-Shipyards)?	EIA 2015; IEEE Standard 1366; P-602
Is Installation internal SAIFI $\leq 1$ (Shipyards*) or $\leq 2$ (Non-Shipyards)?	EIA 2015; IEEE Standard 1366; P-602
Is average Installation Electric Utility Condition Index $> 50$ ?	
Is average Installation Electric Utility Facility Condition Index $> 80$ ?	Facility Sustainment and Recapitalization Policy April 2014
Does Installation utilize an electric distribution system configuration other than radial?	
Is the electric distribution system underground?	
Is average Installation electric utility infrastructure age $< 40$ years?	

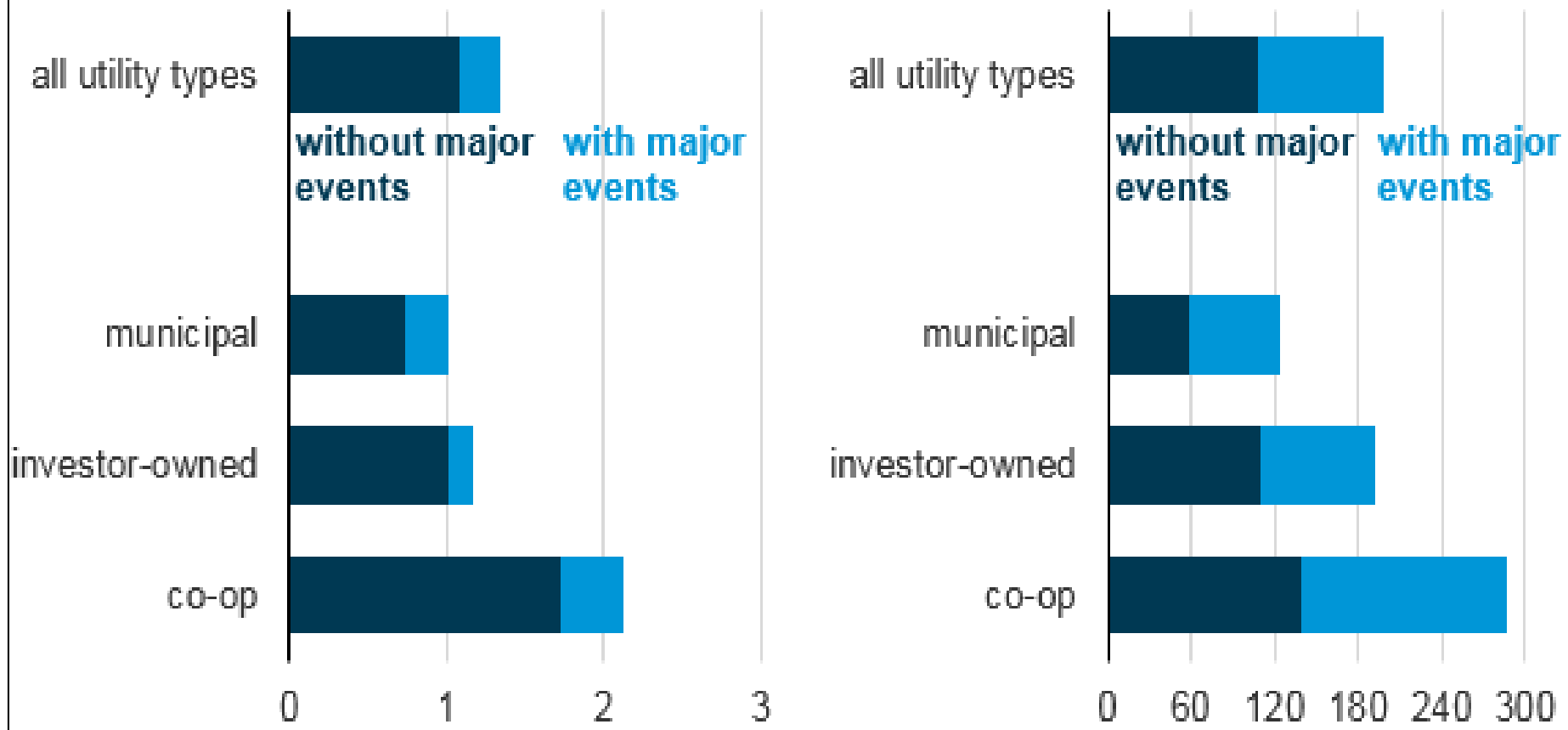
\*For shipyards, requirement increased based on historical patterns and large labor workforce that is displaced for outages



# EIA Average SAIFI/SAIDI



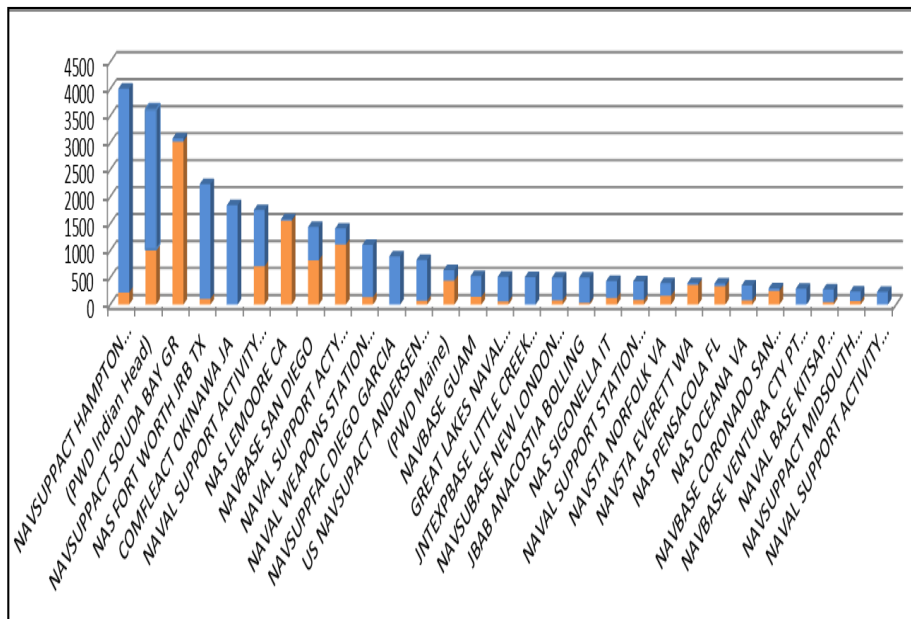
Average electric power service interruptions per customer by utility type, 2015  
frequency (number of instances)      total duration (minutes)





# Reliability Comparison

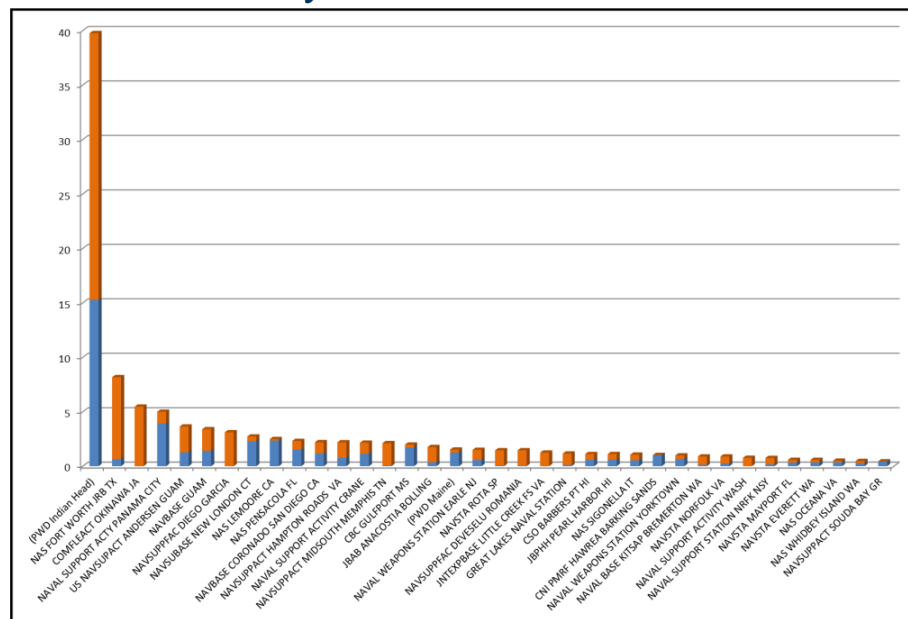
## SAIDI at Navy Installations



## Reliability Benchmarks\*

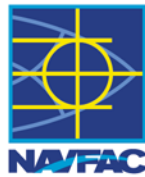
- SAIDI - 60 min Shipyards, 120 min all others
  - SAIFI - 1 for Shipyards, 2 for all others
- \*Based on UNPLANNED outages only*

## SAIFI at Navy Installations





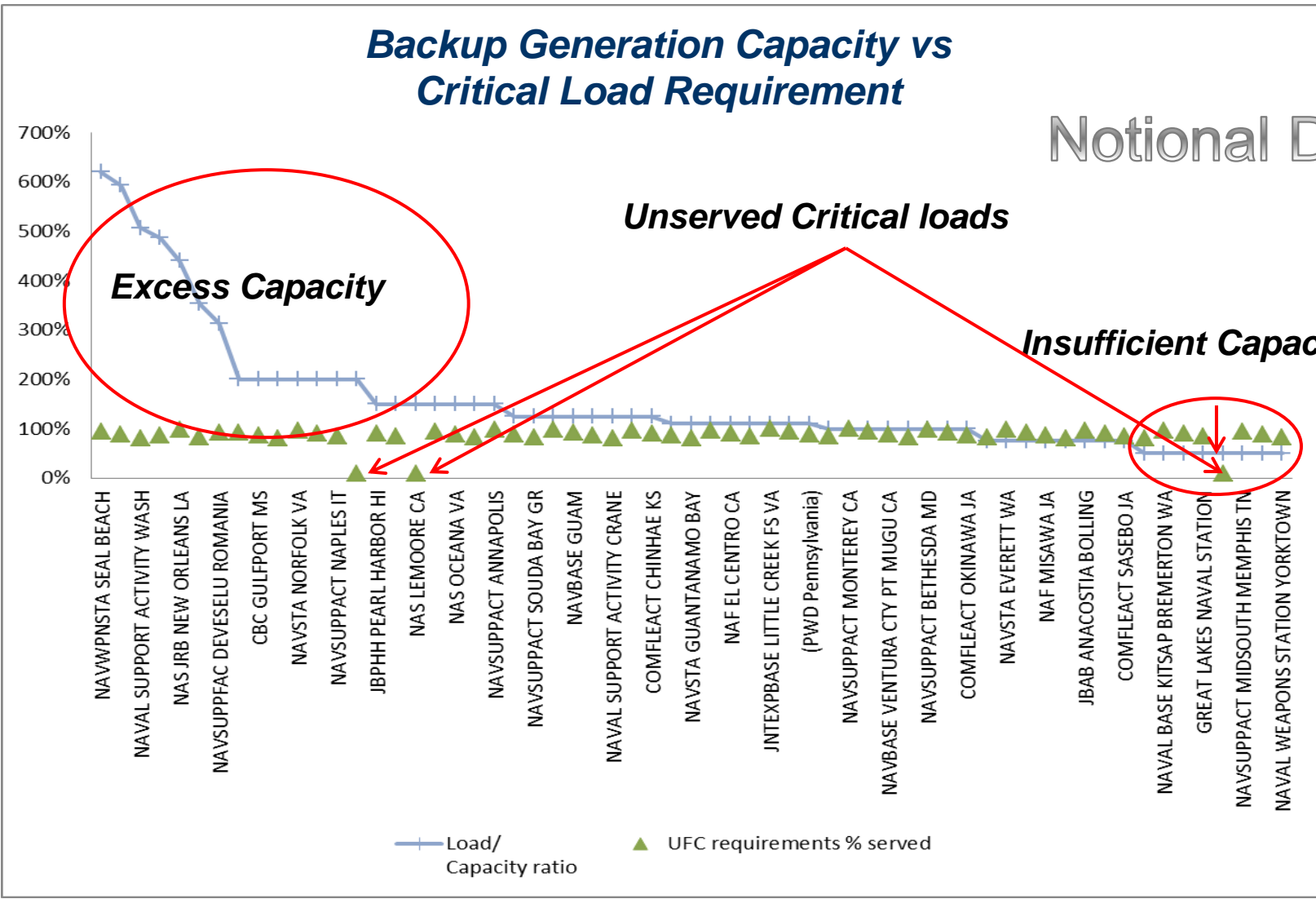
# Resiliency Benchmarks



Primary Threshold	Threshold Reference
Do 100% of facilities with backup generation requirements have sufficient EGEN capacity to meet critical load?	P-602; Unified Facilities Criteria
Is the average backup generator maintenance, testing, and condition score > 3?	Energy Security Assessment Tool
Is percent of peak critical load met by EGEN > 130%?	P-602; Unified Facilities Criteria
Do 100% of critical facilities meet requirements for fuel sourcing?	P-602; Unified Facilities Criteria
Do 100% of facilities with UPS requirements have requisite systems?	P-602; Unified Facilities Criteria
Is average UPS maintenance, testing, and condition score > 3?	Energy Security Assessment Tool



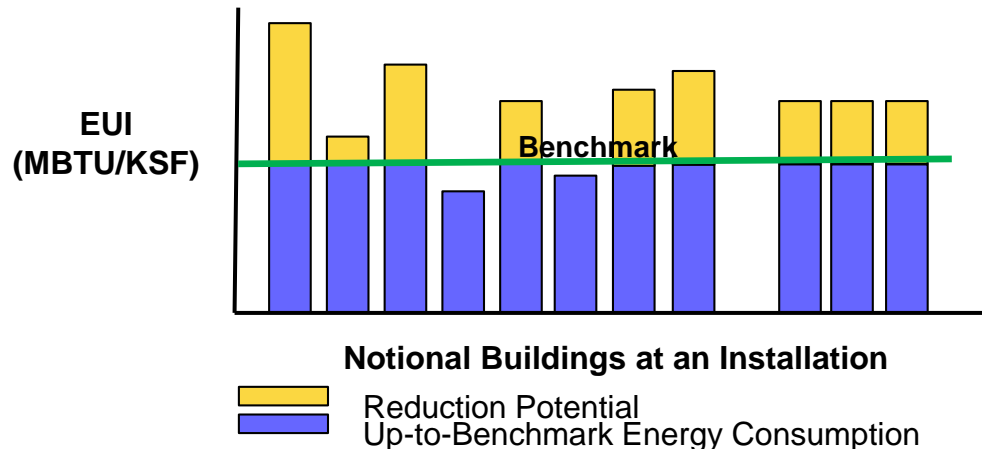
# Resiliency Comparison





# Efficiency Benchmarks

Primary Threshold	Threshold Reference
Does the Installation have a SECNAV award level of > blue?	P-602
Is the performance of Goal Subject Facilities against the benchmark < 50%?	P-602; ASHRAE 90.1
Is the Installation EUI reduction against the 2003 Baseline $\geq$ 30%?	CNO Energy Vision 2010
Is the Installation EUI reduction against the 2015 Baseline $\geq$ 5% (2.5%/year)?	EO 13693
Is percent of Covered Facilities metered > 50?	DoD Utilities Meter Policy Memo 2013





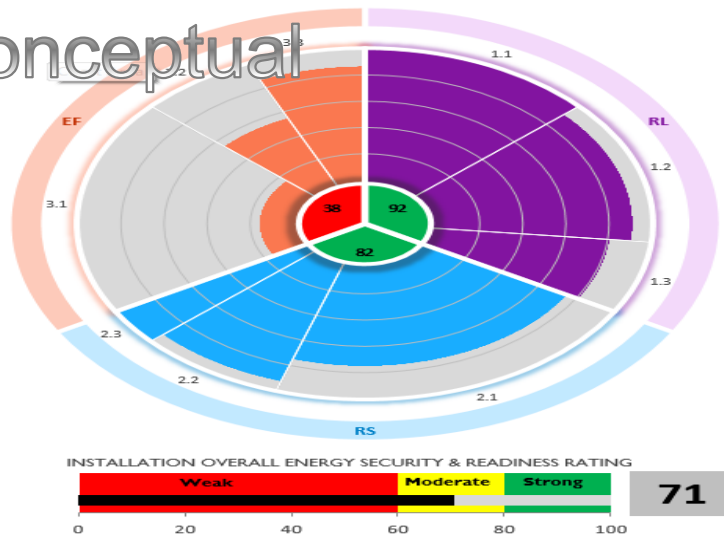


# Installation ESF Scorecard

## Sample Quad Chart



Conceptual



## Reliability

Metric	Value
External/Commercial SAIDI	70.58
External/Commercial SAIFI	1.1
Internal SAIDI	123.2
Internal SAIFI	.47
Condition Assessment	74
System Age	38
System Characteristics	Radial

## Resiliency

Metric	Value
EGEN requirement met	98%
EGEN condition average	3.2
Fuel sourcing requirement	97%
Excess Capacity	10%
UPS requirement met	95%

## Efficiency

Metric	Value
SECNAV Award level	Blue
EUI reduction since 2003	20%
EUI reduction since 2015	4.2%
Facility Benchmark Performance	62%
Meter Status	40%



# Questions



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