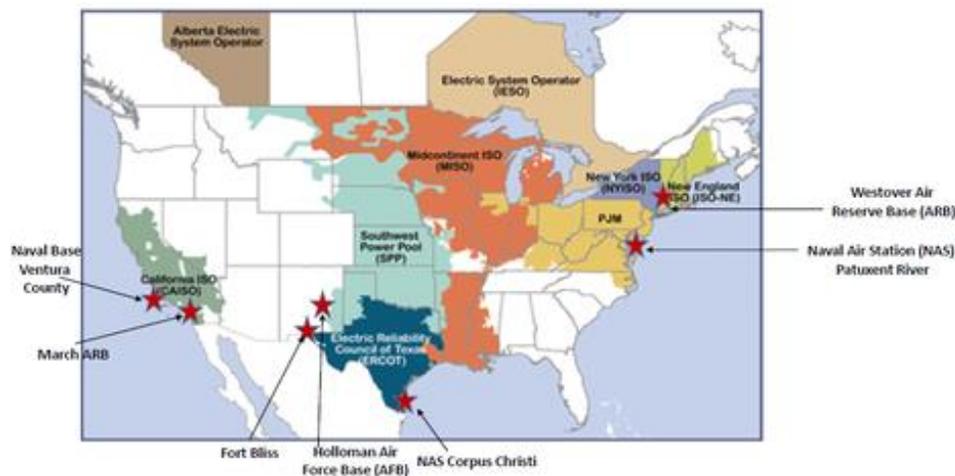




UPDATES

Welcome to our bi-annual Installation Energy and Water newsletter, where we'll be providing periodic updates about new information & products available from the Installation Energy and Water Program Area.

Isolating the Resilience Contribution of Electricity Storage: An Update



The exceptional versatility of electricity storage is a double-edged sword for military microgrids.

Storage, in its various battery chemistries and non-battery forms, can perform more functions and respond more quickly than any other power asset in a microgrid. Storage is increasingly deployed on military installations, in a variety of scales and for a range of resilience, renewable energy integration, and cost saving uses. That, along with improving technology cost and performance, is its positive.

However, the same versatility brings challenges in answering fundamental questions - Is electricity storage a more cost-effective and robust way to provide back-up power than other assets? If so, what types of storage, in what configurations, in what locations, and with what operational rules perform best? I.e., how can its energy security contributions be isolated and replicated for tech transfer?

Those are the questions addressed by ESTCP's "Large Scale Energy Storage and Microgrids" R&D topic. Six project teams, each with a different analytic and operational approach and often with different storage technologies, began work on these questions in late 2018. They are nearing finalization of their Phase I results in what is intended to be a three-phase effort for the most promising teams.

To create a rich data set of results applicable to military installations of various sizes, missions, locations, and Services, the project teams utilized a common set of representative hourly electricity data from the seven installations pictured below, along with actual utility rate and electricity market price data for the respective locations.

The project teams are expected to publish their Phase I findings on ESTCP's website late in 2019, and the initial results have been extremely useful. They point to several types of electricity storage and operational patterns that can be included in microgrids to both lower lifecycle microgrid costs and enhance reliability performance during utility outages ranging from 1 hour to 1 week, compared to microgrids relying exclusively on diesel generators and uninterruptible power supply (UPS). Just as importantly, the results highlight where storage assets make less valuable and more costly contributions to resilience.

To yield results applicable to a wide cross-section of installations and to focus investment dollars on the most promising resilience uses of storage, ESTCP structured this effort in three phases as shown at right. Phase I involves detailed hourly simulation of storage-enabled microgrid performance over a 20-year period compared to an ESTCP-provided baseline microgrid model without storage.

Phase II is likely to include testing of key storage system components and their integration with actual microgrid controllers in specialized, government-sponsored "hardware-in-the-loop" test facilities to validate or expose weaknesses of key simulation factors. As Phase II results warrant, field tests at one or more military installations will occur in Phase III to reach full fidelity in the technology validation process.

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Recently Released Documents Available for Download

- EW-201345 - "Climate Management System for Corrosion Control Facilities" - [Executive Summary, Final Report, and Completed Project Overview](#)
- EW-201407 - "Demonstration of a Building Automation System Embedded Performance Degradation Detector Using Virtual Water/Air Flow Meters" - [Executive Summary, Final Report, and Completed Project Overview](#)
- EW-201518 - "Energy and Water Efficiency Improvements for Dishrooms in Military Dining Facilities" - [Executive Summary, Final Report, and Guidance Document](#)
- EW-201155 - "Integrated Water Planning through Building Level Cascade of Water Use" - [Final Report](#)

Key Events and Meetings

December 3rd-5th 2019 - SERDP and ESTCP 2019 Symposium

At this year's SERDP & ESTCP Symposium, EW will showcase successful technologies at its technical sessions and short courses. The program will present two technical sessions: Energy Resilience Session 1: Outlook and Applications of Distributed Energy Resources, and Energy Resilience Session 2: Building Energy and Water Efficiency Solutions as well as two short courses on the cybersecurity Risk Management Framework (RMF). [MORE](#)



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