U.S. DEPARTMENT OF
ENERGY

Office of
ENERGY EFFICIENCY & RENEWABLE ENERGY

An Integrated Approach to Resilience

The Federal Energy Management Program's (FEMP) Energy and Water Resilience Program assists agencies, both at the portfolio and site level, in developing a strategic approach to resilience planning.

FEMP's strategic energy management assistance helps federal agencies accomplish their missions, enhance the resilience of Federal infrastructure and operations, and reduce costs and waste. With increased interest in enhancing resilience, FEMP's resources can help agencies develop comprehensive and strategic approaches to energy and water resilience planning.

Energy and water resilience is the ability for optimized operations to withstand, adapt, and recover from disruption as required. A resilient site also requires trained personnel and capabilities as well as sufficient resources and sound infrastructure to support essential functions during normal and disrupted operations. Resilience requires diverse solutions that address both resource and infrastructure needs and interdependencies to minimize interruptions of energy and water services.

Strategic Planning

FEMP's expertise helps agencies address all aspects of energy and water resilience to ensure optimized facilities, trained personnel, and sufficient resources to ensure reliability and help support critical missions.

Energy and Water Resilience is a part of FEMP's overall strategy to reduce energy and water waste across federal facilities

By working closely with strategic partners, FEMP validates its tools, resources, and use cases to support the development of agency-neutral resources that can be leveraged and shared across the federal government for replicability

Technical Resilience Navigator

FEMP's new Technical Resilience Navigator (TRN) is based on that commitment to developing and sharing systematic, agency-neutral approaches. The TRN provides agency-neutral information that guide staff through the process of developing, assessing, and implementing projects to enhance site and agency resilience. Its modules cover key topics such as tailoring planning efforts for agency priorities and site constraints, how to identify and quantify resilience metrics appropriate for federal agencies and sites (see sidebar), and how to account for the interactions of the energy and water systems with other critical systems.

The worksheets and additional information included within each module of the TRN provide agencies with actionable resources to go through the process of resilience planning. From guidance on the questions agencies need to answer to understand their critical systems to linked publicly available tools that can help agencies identify hazards and threats. This resource is expected to be public in late 2019.

FEMP Program Areas Support Resilience

Planning for resilience is only the first step: FEMP's focus areas provide the key tools and resources necessary for enhancing federal energy and water resilience. FEMP resources help identify potential failures and interdependencies, ensuring continuity of operations, and help facilities respond and recover from hazards and threats. FEMP also offers tools that help agencies and sites capture recurring energy, water, and resilience needs and requirements. Step-wise guidance helps federal agencies prioritize and integrate technology solutions.

FEMP resources help ensure agencies and facilities meet all aspects required for resilience: optimized facilities, procurement support to ensure necessary project funding, and a trained workforce.

Energy & Water Resilience Metrics

Resilience metrics provide a way to measure the ability of a site's infrastructure to meet specific resilience goals against a defined standard. They also help to reevaluate the site's readiness status after projects and practices have been implemented. Questions that impact a site's resilience which metrics can help answer include:

- **Water Source Redundancy:** How many potable and non-potable water sources are available to the site?
- **Facility Fuel Storage Capacity:** Does the site store adequate energy fuels required to provide needed energy to fully support critical operations in accordance with agency requirements?
- **Water/Energy Interdependency:** Does the site have onsite water supplies available for energy systems supporting critical missions?

Optimizing Facilities

A site that is energy and water resilient proactively optimizes operations that reduce energy and water demand as the "first line of defense" to enable the site to meet energy and water requirements.

FEMP maintains a resource center of tools that can complement resilience planning efforts. These resources provide technical guidance on project identification and development, including metrics, risk assessments, and economic prioritization tools.

For example, REopt can help buildings, campuses, and communities find an optimal mix of renewable energy, convention generation, and energy storage to meet cost savings and energy performance goals.

FEMP's facility cybersecurity tools help identify and develop a cybersecurity risk management strategy and provide insight into common vulnerabilities, threats, and potential impacts from cyber-attacks.

Another tool that provides a holistic and consistent approach to tracking and managing energy use is DOE's 50001 Ready, an energy management system that also supports resiliency through structured maintenance and failure contingency planning.

FEMP also offers factsheets and replicable solution sets focusing on site implementation of technical solutions and best practices, legal drivers, and financing options to help agencies leverage lessons learned across the federal government.

Project Procurement

Once agencies have utilized FEMP resources to identify and prioritize resilience projects, finding the right funding stream or hybrid of appropriated funds and third-party financing is key. FEMP offers support for a variety of performance contracting financing and appropriations options for agencies to implement energy and water efficiency and resilience projects.

In fiscal year 2018, for example, ten federal agencies used FEMP's indefinite-delivery, indefinite-quantity (IDIQ) energy savings performance contract (ESPC) to pursue energy efficiency and water conservation projects. These projects support resilience efforts by reducing demand across federal facilities by replacing aging infrastructure with new, highly efficient equipment. Additionally, these contracts can support the incorporation of combined heat and power (CHP), microgrids, and battery storage which improve site and facility resilience.

Training and Guidance

Resilient sites have the capabilities and trained personnel to anticipate, prepare for, adapt, withstand, respond to, and recover rapidly from energy and water disruption due to planned and unplanned events. Similarly, these sites have sufficient resources and sound infrastructure to supply the required energy and water to essential functions during normal and disrupted operations.

The energy and water management community can utilize FEMP's training program to better understand new technologies and approaches for optimization, energy and water management, and financing. FEMP is developing on-demand energy and water resilience-specific trainings, which are supplemented by accredited, in-person resilience-topics trainings, such as those offered at FEMP's Energy Exchange training event.

Looking Forward

FEMP is partnering with agencies to validate the resources contained within the Technical Resilience Navigator web application. ■

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FEMP Federal Energy Management Program

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