

**RECORD VERSION**

**STATEMENT BY  
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**BEFORE THE**

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**RESILIENCY OF MILITARY INSTALLATIONS TO EMERGING THREATS**

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## **Introduction**

Chairman Langevin, Chairman Garamendi, Ranking Member Stefanik, Ranking Member Lamborn, and distinguished members of the Committees, thank you for this opportunity to testify on “Resiliency of Military Installations to Emerging Threats” and answer any questions you may have. I begin by thanking the committees for the continued support and commitment to our Soldiers, Families, and Civilians. Your leadership and guidance are instrumental to our successful ability to defend our nation and its interests, and I look forward to working with the Committees to achieve our mutual goals of ensuring resiliency at military installations, while supporting readiness, modernization, and reform. The Army seeks to enhance readiness by strengthening our installation resilience, which is vital to accomplish our mission of protecting U.S. national security interests at home and abroad; to modernize our installations to build a more lethal force; and to reform our installation management business processes to maintain effective warfighting operations.

### **Emerging Threats to Army Installation Readiness and Modernization**

The Army Vision states that, “the Army of 2028 will be ready to deploy, fight and win decisively, against any adversary, in a joint, multi-domain, high-intensity conflict. Army will maintain its ability to conduct irregular warfare while simultaneously deterring adversaries anytime, anywhere.” The Army’s concept of Multi-Domain Operations includes the Strategic Support Area, which is the home of Army installations. The Strategic Support Area includes cross-communications and coordination between warfighting commanders and numerous supporting agencies. Forces operating in the Strategic Support Area are never out of contact, and constantly subjected to the possibility of both lethal and non-lethal attacks. The Strategic Support Area is the home to many essential warfighting components, such as cyber, space, command and control, and sustainment capabilities. The battlefield framework has changed, and the Strategic Support Area must have installations that are ready, modern, and able to project lethal power wherever and whenever called upon.

As our installations evolve and rise in their importance to operations, emerging threats have simultaneously presented additional challenges to our installations and national infrastructure that need to be addressed. We generally categorize these threats to our installations under three broad headings: cyber, physical, and natural. As the 2018 U.S. National Defense Strategy states, “[i]t is now undeniable that the homeland is no longer a sanctuary....During conflict, attacks against our critical defense, government, and economic infrastructure must be anticipated.” While our installations have for decades prepared for the possibility of physical attacks, our surrounding and supporting private and public infrastructure are likely far less prepared to prevent or mitigate against that possibility. While we remain vigilant in protecting assets within the Army fence line, we are reliant upon other parties to protect the support infrastructure we rely on for many of our installations. Not just roads and buildings, but water sources and related infrastructure, energy infrastructure, and other supply chains that keep our installations ready to support operations.

There is also the rapidly expanding concern for cybersecurity for our systems and networked infrastructure, both on-and-off installations. In the Worldwide Threat Assessment of the U.S. Intelligence Community, submitted to the Senate Select Committee on Intelligence on 29 January 2019, it was stated that, “China has the ability to launch cyber-attacks that cause localized, temporary disruptive effects on critical infrastructure—such as disruption of a natural gas pipeline for days to weeks—in the United States,” and further stated that, “Russia has the ability to execute cyber-attacks in the United States that generate localized, temporary disruptive effects on critical infrastructure—such as disrupting an electrical distribution network for at least a few hours—similar to those demonstrated in Ukraine in 2015 and 2016.” The assessment went further to state that, “Moscow is mapping our critical infrastructure with the long-term goal of being able to cause substantial damage.”

Meanwhile, I am greatly concerned about the potential consequences of the increased frequency and severity of extreme weather events. The same Worldwide Threat Assessment states that, “[e]xtreme weather events, many worsened by accelerating sea

level rise, will particularly affect urban coastal areas in South Asia, Southeast Asia, and the Western Hemisphere. Damage to communication, energy, and transportation infrastructure could affect low-lying military bases, inflict economic costs, and cause human displacement and loss of life.” Meanwhile, it is also highly likely that the Army will be called upon to assist in a greater number of humanitarian and disaster response events while we are simultaneously impacted.

### **Army Actions Being Taken to Address Emerging Threats to Installations**

A multitude of actions and policies have been put into motion by the Army to address the aforementioned threats to installation resilience. However, I want to be clear that we know we have great challenges ahead of us, to include defining the expanding scope and magnitude of the problems which these threats present. I will now highlight three areas where we have placed particular focus for our installations: cybersecurity of facility-related control systems (FRCSs), resilience of installations energy, and planning for extreme weather.

#### **Cybersecurity of Facility-Related Control Systems**

Army facilities can serve as critical nodes for projecting and sustaining power from our installations. Accordingly, the Army is improving the cybersecurity of FRCS to ensure reliable power for critical missions. This effort will enhance the Army’s ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from utility disruptions that critically impact operations on military installations. In addition, this increased security will improve the sustainability of critical Army missions, provide installation support to operational warfighters, and ensure Army readiness.

To improve FRCS defense posture, Army installations are developing cybersecurity plans to account for the capabilities and resources required to implement controls on their highest prioritized assets and systems. The Army is in the process of integrating

cybersecurity into its overall installation management plans and guidance. For example, our installations now include cybersecurity considerations in the planning, design, construction, operation and maintenance of Army-owned installation FRCS, as well as FRCS associated with infrastructure obtained with alternative finance authorities that may be owned or operated by private parties but in service to Army installations. Specifically, FRCS considerations are now integral to utility privatization agreements, energy savings performance contracts, and utility energy service contracts.

The Army installation enterprise is working closely with LTG Crawford, the Army's Chief Information Officer, LTG Fogarty the Army's Cyber Commander, and GEN Funk, the Army's Chief of Operations, Plans and Training, toward developing solutions and resources ensuring that our FRCS are defensible, survivable, and resilient to operate and sustain critical functions in a cyber-contested environment. A key accomplishment of this collaboration has been establishment of standard benchmarks for assessing cybersecurity risk of control systems and identifying vulnerabilities. The results of these assessments are being used to inform mitigation prioritization efforts and help ensure that infrastructure, facilities, and related services are available when needed.

In addition, the Army is working with interagency partners as well as private sector transportation providers to maintain and improve security—to include cybersecurity—of commercial transportation assets when being use by the military. Further, to ensure that we remain synchronized with local law enforcement and commercial transportation providers we periodically conduct exercises and reviews to identify and reduce friction points to achieve and maintain the required force flow.

### **Installations Energy Resilience**

Energy resilience, or secure, uninterrupted access to energy, is essential for the Army to accomplish its mission. Supplying energy to Army installations has become increasingly challenging as vulnerabilities in interdependent electric power grids, natural gas pipelines, and water resources potentially jeopardize mission capabilities and

security. Data shows that Army installations reported approximately 22,000 combined hours of utility outages in FY 2018 (including Puerto Rico outages). This is a two-fold increase since FY 2017 and an eight-fold increase since FY 2016.

To drive energy resilience more proactively, the Army has refined the processes for assessing energy and water risks and opportunities by utilizing Installation Energy and Water Plans to identify the needs of critical missions and address vulnerabilities. These comprehensive plans are being developed across Army installations in a prioritized fashion, with the first set being completed in the coming months. Installations and commands will use these plans to identify critical requirements for energy, identify energy resilience gaps, develop potential courses of action to fill these gaps, and identify and recommend solutions that are most viable for the installations. Additionally, the Army has undertaken large-scale installation energy disruption exercises in conjunction with the Office of the Secretary of Defense and Massachusetts Institute of Technology's Lincoln Laboratory. The Army has conducted large-scale exercises at four Army installations: Fort Greeley, Alaska; Fort Stewart, Georgia; Fort Knox, Kentucky; and Fort Bragg, North Carolina. These exercises disconnect Army installations from the local power grid to evaluate installations' energy posture, identify capability gaps, and prioritize mission-critical projects. These exercises have revealed capability gaps related to infrastructure, operations and maintenance; the requirement for the identification of critical loads ensuring configuration to appropriate backup generation; and better communications with the wide variety of mission, garrison, and support staff owners. Further, the exercises highlighted that "table top" exercises do not sufficiently identify all energy resilience capability gaps. The Army anticipates doing several more such exercises over the coming year.

The Army is the largest consumer of electricity and installation energy in the Federal government, and spends more than \$1.1B annually. Congressional appropriations, third-party financing, and direct private investments enable the Army to undertake energy infrastructure projects to modernize and diversify on-site generation sources, and repair aging infrastructure to reduce impacts of grid outages and enhance energy

resilience. The Army seeks to develop energy resilience projects with on-site energy generation, energy storage, and energy controls to create "islandable" capabilities to provide the energy necessary to sustain critical missions in the event of a major disruption in supply.

### **Congressional Appropriations**

The Army utilizes the Energy Resilience and Conservation Investment Program (ERCIP), DoD's only direct-funded program targeted for energy resilience. The Army has been focusing on ERCIP projects to incorporate resilience attributes, conserve energy and water, reduce reliance on the grid, and construct on-site power generation and associated infrastructure. In FY 2019, the Army competed for, and received, approximately \$40.5M out of \$193M for eight projects that included some energy resilience capability. While many Army ERCIP projects enhance an installation's energy security, projects must strictly meet the language in the FY 2017 National Defense Authorization Act to compete in the energy resilience category: "enhance mission assurance, support mission critical functions, and address known vulnerabilities." We look forward to continued congressional support of the ERCIP program in FY 2020.

### **Third-Party Financing**

Energy Savings Performance Contracts (ESPC) and Utility Energy Service Contracts (UESC) utilize third-party financing to fund energy resilience approaches. The Army leverages private sector expertise through ESPCs and UESCs to enhance resilience, and improve efficiency. ESPCs and UESCs allow companies and utilities to provide the initial capital investment to design, implement, and maintain energy and water conservation measures, the cost of which is paid back over the course of the contract. These projects address maintenance backlogs and repair or replace aged and failing

equipment using private sector capital repaid from savings realized over the contract term. The Army has the largest ESPC program in the Federal government and the second largest UESC program. Across the board, the Army has awarded more than \$2.9B in ESPCs and UESCs to leverage third-party financing, increase resilience, modernize Army infrastructure, and reduce operating costs. Funding from these sources are instrumental in building energy-resilient solutions at Army installations. One example project is the battery energy storage system at Fort Carson, Colorado. This battery energy storage system is the DoD's largest peak-shaving battery storage project, with 8.5 megawatt hours of storage capacity, which will save Fort Carson approximately \$500,000 annually on its electric bill. This ESPC project, funded by energy cost savings, reduces peak electric demand and increases the resilience of Fort Carson's grid.

### **Direct Private Investments**

The Army's Office of Energy Initiatives (OEI), within my office, specializes in attracting direct private investment for projects that are privately funded, constructed, owned and operated, and typically sited on land leased from the Army that can also provide an energy resilience benefit back to the Army. The OEI serves as the Army's central program management office for the development, implementation, and oversight of privately financed, large-scale energy projects focused on enhancing energy resilience on Army installations. The OEI portfolio includes 11 already operational projects that deliver 325 megawatts of onsite generation capacity. Further, for the total current projects portfolio, 17 of 21 projects bring some "islandable" capability for critical missions for a minimum of 14 days. This office's efforts have attracted an estimated \$627M in direct private capital investment for installations in Georgia, Texas, Alabama, Oklahoma, New York, California, Maryland, and Louisiana among others, to the benefit of the private investors and the Army.

One example of a direct private investment project is located on Schofield Barracks, on the Hawaiian island of Oahu. This energy resilience project is a utility funded, owned

and operated 50 megawatt Multi-Fuel Power Generation Plant, located above the tsunami inundation zone, which provides peaking power capability to the Oahu power grid, to the benefit of the utility's power consumers. In the event of a long-term grid power outage or emergency, the plant is capable of providing the Army's Schofield Barracks, Field Station Kunia, and Wheeler Army Airfield with secure, resilient energy generation for weeks, if necessary. It has been operational since May 2018.

In addition, the Army continues to collaborate with the Department of Defense and the other military services, industry, utility partners, and other Federal agencies, working along with the Department of Energy (DOE) to strengthen our Nation's energy resilience and build a stronger America. In particular, the Army has collaborated with the DOE in evaluating Army energy resilience and to reduce energy costs. The critical topics of the evaluation include: increasing resilience, adopting energy management system standards, and utilization of combined heat and power technologies.

As part of this evaluation, DOE completed a review of Army energy resilience efforts for lessons learned that could be deployed among additional Army installations as well as other Federal agencies. DOE identified energy best practices, key objectives, policy drivers, and ways to improve the alignment between policy drivers and mission-critical capacity metrics. In addition to making recommendations for Army consideration, these inputs were used in development of a DOE comprehensive framework for energy resilience planning and implementation across the Federal government. The evaluation will identify opportunities for energy performance contracting to better include resilience measures. The evaluation began in July of 2018 and will conclude in early 2020.

In addition, DOE and Army worked together to screen 92 Army installations for potential application of combined heat and power systems, and used the results to help inform energy project priorities.

Finally, in collaboration with DOE, Army is piloting the International Organization for Standardization's 50001 energy management system standard, to standardize energy management procedures potentially across 156 Army installations. The benefits of

standardization include: persistent energy & cost reductions, improved strategic energy security/resilience planning, and improved preventative maintenance for continuity of operations and readiness.

### **Planning for Extreme Weather**

The 2018 National Defense Authorization Act, Section 335 requires the Department of Defense to conduct specific vulnerability assessments and develop mitigation plans to address the national security threat posed to installations by climate-related threats, including extreme weather events. In response, the Army worked with the U.S. Army Corps of Engineers (USACE) to develop an interactive climate vulnerability assessment tool to evaluate the near-term vulnerability of Army installations, located in the U.S., to six climate-related threats: coastal and riverine flooding, drought, desertification, wildfire, and permafrost thaw. This tool is based on validated climate data from government agencies and will be available to Army installations in early 2020. The intention is to provide installation managers with a method to identify critical climate hazards and incorporate climate resilience measures into their installation master plans.

The Army accounts for potential natural disaster impacts in the site selection stage of project planning and in applying seismic and hurricane criteria during the design phase of each construction project. A good example of such effort is a major modernization project for the Army's Powertrain Facility at Corpus Christi Army Depot in Texas where the project site was changed to an elevation of 25 feet above sea level to protect it from a Category 3 level hurricane storm surge.

### **Conclusion**

Readiness is, and must continue to be, the Army's number one priority. While our attention is on the increasing threats to Army installations and supporting infrastructure,

we remain aligned with the Secretary of Defense and the Secretary of the Army's efforts to build, sustain, and ensure warfighting capabilities. As outlined in the National Defense Strategy, Army modernization efforts support our readiness priority, in order to meet current and future threats. Army installations are readiness platforms where our Soldiers live, train, and work. Attaining desired readiness levels requires both a system-wide assessment of current conditions and a modernization effort that seeks to mitigate risk, while setting conditions to meet all threats. The Army's 156 installations must be ready, secure, and capable of deploying and sustaining forces in contested environments, anytime and anywhere the Army may be called upon to fight and win our Nation's wars.

We greatly appreciate the flexible authorities and funding provided by the Congress in FY 2019, and commit to continue being responsible stewards of the resources and responsibilities entrusted to us. On behalf of the Soldiers, Civilians, and Families, I am proud to serve, appreciate the opportunity to present this testimony, and thank you for your continued support of the United States Army.