THE OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION
AND SUSTAINMENT

May 20, 2021

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS ENERGY, AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (ENERGY, INSTALLATIONS, AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (INSTALLATION, ENVIRONMENT AND ENERGY)
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Metrics and Standards for Energy Resilience at Military Installations

This memorandum implements the requirements of title 10, U.S.C., section 2911(a), by establishing metrics and standards for the assessment of energy resilience pursuant to section 2911(b)(1). The purpose of these metrics and standards is to ensure the energy resilience of Department of Defense (DoD) military installations. It fulfills, in part, the responsibility of the Secretary under section 2911 and incorporates the new requirements within title 10, U.S.C., section 2920, which was added by the National Defense Authorization Act for Fiscal Year 2021.

As discussed in the 2018 National Defense Strategy, the variety and velocity of global threats continue to rapidly evolve. The homeland is no longer a sanctuary, and we must anticipate potential attacks and mitigate risks to our critical defense, government, and economic infrastructure. In this environment, maintaining secure access to energy resources is critical to the execution of DoD missions, and ensuring energy resilience at our installations is a top priority.

DoD Instruction (DoDI) 4170.11, Installation Energy Management, requires DoD components to take necessary steps to plan and have the capability to ensure available, reliable, and quality power to continuously accomplish critical DoD missions from our installations. To that end, the attachment to this memorandum provides metrics and standards for assessing energy resilience, and includes supporting policy, guidance, and reporting requirements. This memorandum and its attachment apply to all permanent and enduring installations worldwide.

This memorandum replaces and cancels a memorandum of the same title dated February 25, 2020. The provisions of this memorandum and its attachment will be incorporated into the relevant DoD issuances at their next revision, such as DoDI 4170.11. The DoD Components shall take immediate action to implement this memorandum and its attachment.

My point of contact to implement this memorandum and for questions is Dr. Ariel Castillo, 571-372-6830.

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Stacy A. Cummings
Principal Deputy Assistant Secretary of Defense
(Acquisition)
Performing the Duties of the Under Secretary of
Defense for Acquisition and Sustainment

Attachment:
As stated

cc.
Chairman of the Joint Chiefs of Staff
Under Secretary of Defense for Research and Engineering
Under Secretary of Defense for Policy
U.S. Army Corps of Engineers (USACE)
Naval Facilities Engineering Systems Command (NAVFAC)
Air Force Civil Engineer Center (AFCEC)
Defense Advanced Research Projects Agency (DARPA)

METRICS AND STANDARDS FOR ASSESSMENT OF ENERGY RESILIENCE, SUPPORTING POLICY, GUIDANCE, AND REPORTING REQUIREMENTS

I. POLICY

It is DoD policy that:

- Pursuant to 10 U.S.C. § 2911(a), the DoD Components shall plan and program for the provision of energy resilience and energy security for DoD installations.

- Pursuant to 10 U.S.C. § 2911(a), the DoD Components shall, by the end of fiscal year 2030, provide that 100 percent of the energy load required to maintain the critical missions of each DoD installation have a minimum level of availability of at least 99.9 percent per fiscal year, or higher availability as this memorandum provides.

- The DoD Components shall perform energy resilience assessments of energy systems for critical missions and supporting infrastructure in support of mission readiness on all permanent and enduring installations.

II. METRICS AND STANDARDS.

The following requirements constitute the metrics and standards for the achievement of energy resilience at permanent and enduring installations:

- Planning and programming for energy resilience and energy security shall —
  - promote the use of multiple and diverse sources of energy, with an emphasis favoring energy resources originating on the installation such as modular generation;
  - promote the installation of cyber-resilient microgrids to ensure the energy security and energy resilience of critical missions;
  - favor the use of full-time, installed energy sources rather than emergency generation;
  - by the end of fiscal year 2030, provide that 100 percent of the energy load required to maintain the critical missions of each DoD installation have a minimum level of availability of 99.9 percent per fiscal year, or higher availability as this memorandum provides;
  - provide for a minimum of 14 days of energy disruption, unless otherwise prescribed by the military department or other departmental guidance;
  - ensure the minimum level of energy availability standards within this policy are applied to both steady state operations and for the purposes of energy resilience during a disruption to operations;
  - ensure mission and economic trade off analyses are conducted to prioritize technology solutions based on the requirements set forth in this policy;
  - include black start exercises as required by law and policy;
  - include adequate sustainment resources to maintain real property investments and ensure the safe operation and testing of energy infrastructure;
  - promote regular maintenance, testing, and disruption prevention practices related to onsite energy systems, including backup generators;

- identify different time horizons for different phases of planning; and
- base decisions on a risk analyses of threats and hazards to meet mission needs.

- Planning and programming shall identify each of the following for each DoD installation based on the installation's own determination using an operational risk management framework to assess hazard probability and severity:
  - The critical missions of and supported by the installation.
  - The energy requirements of those critical missions located on, or supported by, the installation.
  - The duration those energy requirements are likely to be needed in the event of a disruption or emergency.
  - The current source of primary energy provided to those critical missions.
  - The duration that the currently provided energy would likely be available in the event of a disruption or emergency.
  - Any currently available sources of energy that would provide uninterrupted energy to critical missions in the event of a disruption or emergency, and the likely duration those sources would be available.
  - Documentation that available energy sources have been adjudicated and prioritized for use among dependent missions.
  - Alternative sources of energy that are not currently available but could be developed to provide uninterrupted energy to critical missions in the event of a disruption or emergency.
  - Alternative means of executing the mission as needed.

- Energy resilience assessments shall utilize the information developed for planning and programming and apply the other metrics and standards provided in section III to determine whether the installation meets the standards and requirements established in DoD Instruction 4170.11 and this memorandum for energy resilience.
  - Such assessments shall either demonstrate compliance with the standards and requirements or identify where, and under what circumstances, the installation's energy and power systems are not in compliance.
  - Such assessments shall include black start exercises that test installation energy systems by completely separating the installation from the primary source of power for periods designed to evaluate the ability of the installation to perform critical missions without such resources. Such exercises and tests may exclude, if technically feasible, housing areas, commissaries, exchanges, and morale, welfare, and recreation facilities.

- At the installation level, DoD Components shall identify (1) any risks of noncompliance identified during the assessments, (2) the costs projected to remediate such risks, and (3) progress to remediate risks that have been identified during assessments.

- 10 U.S.C. § 2920(a)(2) provides that the Secretary of Defense shall issue standards establishing levels of availability relative to specific critical missions, with such standards providing a range of not less than 99.9 percent availability per fiscal year and not more than 99.9999 percent availability per fiscal year, depending on the criticality of the mission. Pursuant to 10 U.S.C. § 2920, energy availability standards for DoD installations are

established as follows:

- For any operational headquarters facility, airfield and supporting infrastructure, harbor facility supporting naval vessels, munitions production and storage facility, radar, space launch facility, or operational communications facility that is determined to be a critical mission, the minimum level of availability shall be 99.999 percent per fiscal year.
- For any missile field, ballistic missile early warning radar, satellite control facility, cyber operations facility, or biological defense facility that is determined to be a critical mission, the minimum level of availability shall be 99.9999 percent per fiscal year.

- In applying the minimum energy availability standards in this policy memorandum, DoD Components should consider their unique operational requirements to ensure the cost effectiveness of meeting mission requirements. For example, considerations should include whether a facility or infrastructure is performing the critical mission specified or if the critical mission will be performed at an alternative location when an energy disruption occurs. If the critical mission will be performed at the alternative location, the minimum energy availability standards shall apply to those alternative locations.

III. DETAILED PROCEDURES FOR DEVELOPING ENERGY RESILIENCE ASSESSMENTS

The following constitute additional metrics and standards for developing energy resilience assessments in order to comply with the metrics and standards set forth in Section II.

A. Critical energy load requirements.

DoD Components shall clearly define, identify, and update critical energy loads that align to critical missions. Critical energy loads shall be developed in collaboration with operators, tenants, and critical mission owners on military installations. Per DoDI 4170.11, Components shall incorporate defense critical infrastructure (DCI)[1] and supporting infrastructure when developing critical energy loads to ensure compliance with this memorandum. Components can compute their critical energy loads through an engineering facility energy load analysis or from metering data. Load assessments also should include time-derived requirements as appropriate to support mission changes in contingency situations. Critical energy requirements, to include critical energy loads, shall be reviewed and updated on an annual basis through the Annual Energy Management Resilience Report (AEMRR) reporting process in accordance with 10 U.S.C. § 2925(a).

Unified Facilities Criteria (UFC) specifications[2] provide definitions and guidance to assist in the determination of critical electric and thermal energy loads and to conduct facility energy load analyses. The critical energy requirements identified by DoD Components shall be

[1] For further guidance, see DCI Level of Effort (LOE) Security Classification Guide (SCG) and Baseline Elements of Information for Missions Assurance. DCI includes defense critical assets and task critical assets.

[2] See UFC 3-501-01, *Electrical Engineering* and UFC 3-540-01, *Engine-Driven Generator Systems for Backup Power Applications* for electrical loads, and UFC 3-401-01, *Mechanical Engineering*, UFC 3-410-01, *HVAC*, UFC 3-420-01, *Plumbing*, UFC 3-430-08N, *Central Boiler Plants,* and 3-400-02, *Engineering Weather Data* for calculating non-electric energy loads (steam, hot water, water and wastewater) for specific systems.

used to determine energy generation systems, infrastructure, equipment, fuel, testing, and exercising requirements for successful achievement of energy resilience.

Metered data may be available in varying degrees of accuracy to construct critical energy load profiles. In the event that critical energy loads are centralized on a DoD installation (e.g., main feeder), an aggregate reading of critical loads can be used to determine the projected and actual (i.e., tested) requirements of the loads in island mode.

If metered data is unavailable or incomplete, energy load analysis procedures are provided within UFC and Institute of Electrical and Electronics Engineers (IEEE) guidance. For example, UFC 3-501-01[3] provides demand data tables in its Appendix D, which can be used to calculate an original basis of design.

However, this initial basis of design may not be sufficient for energy load analysis in island mode. Energy load analysis for islanded operations should be conducted in accordance with IEEE 1547.4,[4] Clause 5. The energy load analysis should evaluate historical demand profiles in order to identify step loads, motor loads, and the projected and actual (i.e., tested) requirements in island mode. Additionally, it is important that energy load analysis be conducted for both grid-connected and island modes.

B. Energy availability calculation.

Availability refers to the availability of required energy at a stated instant of time or over a stated period of time for a specific purpose. A stated period of time should align to the DoD Component's mission, such as annually for steady state operations or over 14 days for the purposes of providing energy resilience when operations are disrupted.

Availability is measured as follows:

$$Availability = \frac{Uptime}{Uptime + Downtime}$$

Uptime is the length of time the critical mission operation requires energy throughout the year, and downtime is the length of time the critical mission operation can tolerate before mission failure occurs. The uptime and downtime hours based on mission risk are metrics to help determine mission availability.

For modern critical facilities, the typical benchmark availability ranges from 99.999% ("five nines") to 99.9999% ("six nines")[5]. Table 1 shows mission availability associated with different downtimes, assuming total mission time over the course of one year is 8,760 hours (24

[3] UFC 3-501-01, *Electrical Engineering.*
[4] IEEE 1547.4, *Standard for Interconnecting Distributed Resources with Electric Power Systems.*
[5] *BITS Guide to Business-Critical Power*, Business Innovation Technology and Security (BITS) Division, Bank Policy Institute, September, 2006.

hrs. x 365 days). In order to achieve five-nines level of availability, mission downtime cannot exceed approximately five minutes per year. For a six-nines level of availability, that number is approximately 30 seconds per year.

Table 1: Mission availability for different down times (annual)

Uptime (hrs)	Downtime (Days:Hrs:Mins:Sec)	Mission Availability (%)
8751.24	0:8:45:36	99.9%
8759.12	0:0:52:34	99.99%
8759.91	0:0:5:15	99.999%
8759.99	0:0:0:31	99.9999%

Similarly, Table 2 shows mission availability associated with downtimes over a 14-day period (or total mission time of 336 hours). In order to achieve five-nines level of availability, mission downtime cannot exceed approximately 12 seconds over 14 days. For a six-nines level of availability, that number is approximately 1 second over 14 days.

Table 2: Mission availability for different down times (14 days)

Uptime (hrs)	Downtime (Mins:Sec)	Mission Availability (%)
335.664	20:09	99.9%
335.9664	2:01	99.99%
335.9966	0:12	99.999%
335.9997	0:01	99.9999%

C. Energy reliability.

Energy reliability refers to the ability of a component or system to perform required functions under stated conditions for a stated period of time. Institute of Electrical and Electronics Engineers (IEEE) Standard 3006.8-2018[6] contains reliability data for equipment used in power systems which can help inform reporting on mission availability. However, while reliability data for equipment is associated with system reliability metrics, system reliability metrics do not take into account mission-based risks. DoD installations shall consider mission-based risks in their downtime measures when developing critical energy requirements. Of special importance, the calculation of reliability will consider the volume over length of time required of supporting fuels; even the best infrastructure can adequately address risk only if the supporting fuel supply is both secure and available from both a cyber and physical perspective.

Energy reliability and power quality impact DoD installations and help determine mission availability for energy resilience measurement. Both power quality and reliability affect energy resilience and mission availability. Further, outage information and data provide an avenue to

[6] IEEE Standard 3006.8-2018: *Recommended Practice for Analyzing Reliability Data for Equipment Used in Industrial and Commercial Power System*s.

help capture energy resilience performance to determine mission availability. Therefore, it is important for military installations to provide accurate outage data through the AEMRR data call to ensure energy resilience at DoD installations. Table 2 provides details and describes the differences between energy reliability and energy resilience (mission availability).

Table 3: Energy reliability and mission availability comparison

Measurement Area	Metric / Measure/ Requirement
Energy Reliability	• System availability o Planned versus unplanned outages • Reliability response time • Condition assessment (life safety) • Inventory changes
Energy Resilience	Mission Availability* = $\frac{\text{Uptime}}{\text{Uptime + Downtime}}$ **This metric does not constitute a "system" availability metric; rather it should represent a mission requirement (critical load) that identifies an energy capability metric. Uptime and Downtime are measured at the critical energy load level vice the utility system level.*

D. Systems design for energy resilience.

DoD Components shall identify, design, and install primary and backup power, to include emergency, standby, and critical operations power systems, as well as infrastructure, equipment, and fuel to support critical energy requirements.

Energy resilience solutions are not limited to traditional backup power systems or generators, nor are those traditional backup systems or generators favored. Energy resilience solutions can and should include integrated, distributed, renewable energy sources, energy storage, generation capable of accepting multiple fuel sources, quick connects for portable generation, and microgrids and centralized generation; diversified or alternative fuel supplies; relocating missions to alternative locations; and upgrading, replacing, and maintaining current energy systems, infrastructure, and equipment on DoD installations. Alternative locations that require energy in the event of an energy disruption or emergency also shall be subject to energy resilience requirements, to include minimum energy availability standards.

When selecting distributed or renewable energy systems and backup generators for energy resilience, they shall be properly designed to have the ability to prepare for and recover from energy disruptions that degrade mission readiness. Their design should include automatic, cyber-resilient transfer switching, inverters, and black start capabilities to minimize energy resilience risks. DoD Components shall also determine fueling or storage requirements for the selected energy generation systems. DoD Components shall follow relevant UFCs for safe and cost effective designs of energy generation systems that minimize energy resilience risks when

complying with requirements stated in this memorandum.

DoD Components shall ensure that primary power and backup power systems, infrastructure, equipment, and fuel that support their critical energy requirements receive the necessary maintenance. At a minimum, DoD Components shall maintain primary power and backup power systems according to their technical specifications and ensure that there is a trained operator assigned to maintain the energy generation system, infrastructure, equipment, and fuel. DoD Components shall ensure that trained operators have the appropriate credentials to operate unclassified and classified energy systems, infrastructure, equipment, and fuel. DoD Components also shall develop and update fueling plans and ensure that fueling contracts are in place. DoD Components shall consult the Defense Logistics Agency Energy (DLA) or local service providers when determining their fueling requirements.

E. Testing and Exercising.

The Military Departments and Defense Agencies shall comply with 10 U.S.C. § 2920(d)(2) requirements for black start exercises, with each Military Department and Defense Agency scheduled to conduct such an exercise on a number of installations each year sufficient to allow that Military Department or Defense Agency to meet the goals of 10 U.S.C. § 2920(d)(2), but in any event not fewer than five installations each year for each Military Department through fiscal year 2027. The Assistant Secretary of Defense for Sustainment will establish a schedule for performance of black start exercises in collaboration with the Military Departments and Defense Agencies. Black start exercises shall be conducted in accordance with the schedule, notwithstanding any other provision of law. No such exercise shall last longer than five days. Military Departments and Defense Agencies shall coordinate on any black start exercise prior to its occurrence.

DoD Components shall conduct black start exercises, and full-scale and routine testing of backup generators, energy generation systems, infrastructure, equipment, and fuel that support their critical energy requirements, in accordance with DoD Instruction 4170.11, Installation Energy Management. Additional guidance for table-top and black start exercises is provided in Deputy Assistant Secretary of Defense (Environment and Energy Resilience) (DASD(E&ER)) guidance, *A Framework for Planning and Executing Black Start Exercises* and *Energy Resilience Tabletop Exercise (ERTTX) Framework.*

F. Execution and implementation of energy resilience.

DoD Components shall review and assess the vulnerability of their installations to energy disruptions as outlined in this document, and implement remedial actions to remove unacceptable energy resilience risks. The types of assessments and tools DoD Components can use to identify and remediate risks, include, but are not limited to, installation energy plans, energy resilience assessments, tabletop exercises, and black start exercises. As a result of these reviews and assessments, DoD Components shall provide energy projects which remediate energy resilience risks during the planning, programming, budgeting, and execution (PPBE) process. These energy projects shall be pursued based on life cycle cost effectiveness, whether they remove unacceptable energy resilience risks or accelerate adoption of low-carbon alternative energy.

Additionally, DoD Components shall ensure energy resilience projects have been coordinated with Federal, State, and local community partners to consider the impacts of and advance energy resilience priorities. In accordance with available statutory authority, DoD Components also are encouraged to use alternative financing in the pursuit of energy resilience projects, when it is life cycle cost effective. DoD Components should review existing DoD policy and guidance in the pursuit of alternatively financed projects. Per DoD Instruction 4170.11, DoD Components shall also use National Institute of Standards and Technology Handbook 135, Life Cycle Costing Manual to determine life cycle cost effectiveness.

Further, DoD Components shall review and consider their real property inventory submissions for alignment to 10 U.S.C. § 2911 and § 2920 energy resilience requirements. DoD Components shall ensure that real property inventory energy resilience investments are consistent with Title 10 requirements for sustainment funding and facility sustainment model (FSM) resourcing considerations. DoD Components also shall ensure alignment of critical missions, facilities, generation systems, infrastructure, equipment, and fuel requirements to Title 10 requirements in their real property submissions to ensure energy resilience risks are remediated. For example, facility asset code (FAC) 8112 is for stand-by/emergency power. Other important FACs such as 8111 (electric power generation plant), 8113 (hydroelectric plant), 8114 (wind generation), and 8115 (photovoltaic generation) from the Real Property Classification System can be used to inform reporting. DoD installations should note that information and data must be reported into the real property inventory for consideration of FSM and sustainment funding.

Per DoD Instruction 4170.11, the Assistant Secretary of Defense for Sustainment shall issue supporting implementing, technical, or budgetary guidance to assist DoD Components to prioritize energy resilience, and shall update and provide energy resilience guidance, as needed.

IV. ENERGY RESILIENCE REPORTING

A. Reporting.

Reporting shall be conducted for all permanent and enduring installations as part of the AEMRR data call. Data and information will be included in the AEMRR and shall be submitted to the Office of the Secretary of Defense (OSD) through routine DoD Component AEMRR submissions. Detailed installation energy resilience information should be documented in Installation Energy Plans (IEPs) required by the Assistant Secretary of Defense for Energy, Installations, and Environment Memorandum: "*Installation Energy Plans – Energy Resilience and Cybersecurity Update and Expansion of the Requirement to All DoD Installations*," dated May 30, 2018. In addition, pursuant to 10 U.S.C. § 2920(d)(1)(B), any data to conduct monitoring, measuring, and testing of energy resilience shall be made available to the Assistant Secretary of Defense for Sustainment upon request.

B. Protecting classified and controlled unclassified information (CUI).

To the maximum extent practicable, DoD Components should submit unclassified information and data the Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience (ODASD(E&ER)). Authority is provided under 10 U.S.C. § 2925(a) to

submit classified information and data to the congressional defense committees. If DoD Components submit classified information or data, they shall coordinate the classified submission with their operations security manager and the OSD point of contact.

The submitting point of contact or office of primary responsibility shall ensure all energy resilience data and related information are properly marked and protected in accordance with DCI SCG, DoD operations security directives, instructions, and manuals, including DoD Directive 5205.02E; DoD Instructions 3020.45, 5200.01, and 5230.24; and DoD Manual 5205.02-M.

DoD Instruction 5230.24 allows for limited distribution markings to protect information and technical data that provide insight into vulnerabilities of U.S. critical infrastructure, including DoD warfighting capabilities vital to national security that are otherwise not publicly available. DoD Components shall consider the appropriate uses of limited distribution markings on their submission in accordance with DoD security guidance.

There are six relevant categories of CUI data defined by the National Archives and Records Administration (NARA): Controlled Technical Information (CTI), Critical Infrastructure (CRIT), DoD Critical Infrastructure Security Information (DCRIT), Critical Energy Infrastructure Information (CEII), Physical Security (PHYS), and Protected Critical Infrastructure Information (PCII).

V. DEFINITIONS

In this attachment, the following definitions apply:

availability. The availability of required energy at a stated instant of time or over a stated period of time for a specific purpose (10 U.S.C. § 2920(h)(1)).

backup power system or generator. For purposes of this guidance, the term backup power system or generator is used to ensure that installations encompass all of the necessary power systems or generators necessary when complying with energy resilience requirements, to include emergency, standby, and critical operations power systems.

black start exercise. An exercise in which delivery of energy provided from off an installation is terminated before backup generation assets on the installation are turned on. Such an exercise shall – (a) determine the ability of the backup systems to start independently, transfer the load, and carry the load until energy from off the installation is restored; (b) align organizations with critical missions to coordinate in meeting critical mission requirements; (c) validate mission operation plans, such as continuity of operations plans; (d) identify infrastructure interdependencies; and (e) verify backup electric power system performance (10 U.S.C. § 2920(h)(2)).

critical energy loads. Energy loads for critical missions on DoD installations that require energy resilience and energy security, which are defined in 10 U.S.C. § 101(e)(6) and (e)(7).

critical energy requirements. Critical energy loads, duration, availability, and other measures that

ensure critical missions and their supporting infrastructure on DoD installations continue to operate in the event of a loss of power.

critical mission. The term 'critical mission' – (A) means those aspects of the missions of an installation, including mission essential operations, that are critical to successful performance of the strategic national defense mission; (B) may include operational headquarters facilities, airfields and supporting infrastructure, harbor facilities supporting naval vessels, munitions production and storage facilities, missile fields, radars, satellite control facilities, cyber operations facilities, space launch facilities, operational communications facilities, and biological defense facilities; (C) does not include military housing (including privatized military housing), morale, welfare, and recreation facilities, exchanges, commissaries, or privately owned facilities (10 U.S.C. §2920(h)(3)).

critical operations power systems. Those systems so classed by municipal, state, federal or other codes by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such as system. These systems include but are not limited to power systems, HVAC, fire alarm, security, communications, and signaling for designated critical operations areas. COPS includes power systems for facilities or parts of facilities that require continuous operation for the reasons of public safety, emergency management, national security, or business continuity (NFPA 70, National Electrical Code, Article 708).

emergency systems. Those systems that are legally required and classed as emergency systems by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure to the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life (NFPA 70, National Electrical Code, Article 700).

enduring location. A main operating base, forward operating site, or cooperative security location designated by the Department of Defense for strategic access and use to support United States security interests for the foreseeable future (Joint Publication 4-04).

energy. Electricity, natural gas, steam, chilled water, and heated water (10 U.S.C. § 2920(h)(4)).

full-scale system testing. Operation of all associated emergency and standby energy generation systems, infrastructure, equipment and fuel at full operational loads while completely separated from the primary source of power.

military installation. A base, camp, post, station, yard, center, or other activity under the jurisdiction of the Secretary of a military department or, in the case of an activity in a foreign country, under the operational control of the Secretary of a military department or the Secretary of Defense, without regard to the duration of operational control (10 U.S.C. § 2801(c)(4)).

modular generation. Distribution connected energy generation systems that may either be connected to the local installation energy grid during normal operations or that has the ability to isolate to continue operations in the event of an energy disruption. Modular generation may include

distributed energy resources (renewable or fossil fuels), storage, portable generation, or centralized generation that can be incorporated into an integrated energy system (e.g., energy and backup systems configured in a microgrid).

standby systems. Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by any governmental agency having jurisdiction. These systems are intended to automatically supply power to selected loads (other than those classed as emergency systems) in the event of failure of the normal source (NFPA 70, National Electrical Code, Article 701).

permanent installation. 'Permanent installation' has the same meaning as provided for 'military installation' in 10 U.S.C. § 2801(c)(4).

VI. POINTS OF CONTACT

A. Office of Deputy Assistant Secretary of Defense for Environment and Energy Resilience.

Points of Contact:

Ariel Castillo, Ph.D.
571-372-6830
ariel.s.castillo.civ@mail.mil

B. U.S. Army Corps of Engineers (USACE), Power Reliability Enhancement Program (PREP).

PREP provides electrical and mechanical engineering support to assess resiliency of critical power systems for command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) facilities. PREP provides these services through direct funding for specific DoD organizations, and on a reimbursable basis for other critical facilities.

Engineering support includes data collection, testing, design analysis, and project planning activities, such as availability/reliability studies, condition assessments, conceptual designs, fault current/protection coordination/arc flash analyses (a.k.a. short-circuit studies) and development of scopes of work and cost estimates. PREP can also make connections with the contracting, design, and construction services provided by the USACE.

PREP maintains a reliability database of electrical and mechanical equipment, published in Army Technical Manual 5-698-5, National Fire Protection Association Recommended Practice for Electrical Equipment Maintenance 70B, and Institute of Electrical and Electronic Engineers Standard 3006.8-2018, Recommended Practice for Analyzing Reliability Data for Equipment Used in Industrial and Commercial Power Systems. These technical manuals are informed by PREP's analyses and subject matter experts who serve on several standards and criteria

development committees.

Installations may contact PREP directly to request assistance.

Point of Contact:

Ms. Martha Kiene
703-704-2764
martha.e.kiene.civ@mail.mil

C. U.S. Army Corps of Engineers (USACE), 249th Engineer Battalion (Prime Power).

The 249th Engineer Battalion (Prime Power) provides prime electrical power, power distribution, and technical expertise to specific theater missions including strategic sites. It provides comprehensive technical and subject matter expertise for the analysis, construction, testing, repair, and sustainment of electrical systems ranging between tactical and commercial power systems including critical infrastructure. Examples of the work provided are lightning protection testing and analysis, ground grid testing, substation maintenance, and electrical systems analysis for back-up generation. All work is conducted or analyzed against industry standards and best practices. The 249th provides these services through customer provided funding.

Installations may contact the 249th directly to request assistance.

Point of Contact:

249th Engineer Battalion (Prime Power) Operations
usarmy.belvoir.usace.list.249-eoc@mail.mil