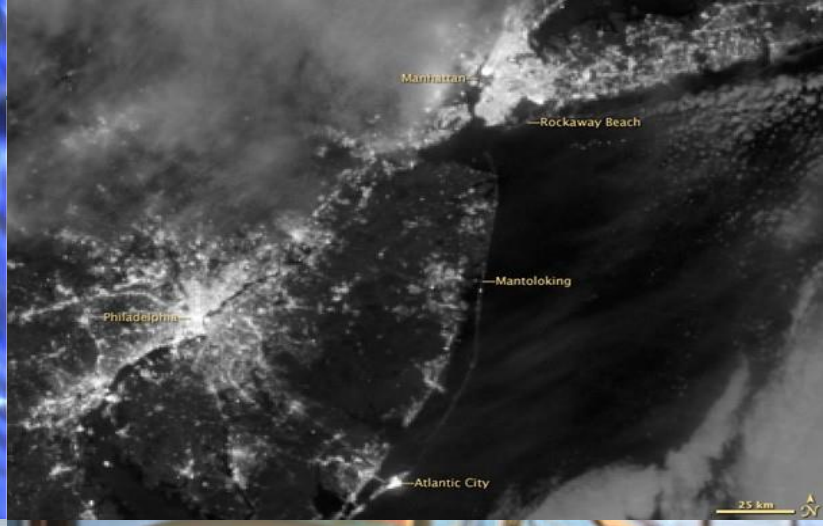

Power Outage Incident Annex to the Response and Recovery Federal Interagency Operational Plan

January 2025

Homeland Security

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Handling Instructions

Distribution, transmission, and destruction of this annex is in accordance with Department of Homeland Security Management Directive 11042.1.[1] Submit questions pertaining to the distribution, transmission, or destruction of this annex to the Planning and Exercise Division, National Planning Branch.

Intended Audience

The primary audience for this annex is federal departments and agencies with a role in emergency management. However, state, local, Tribal Nations, and territorial (SLTT) officials, as well as private sector and non-government partners with roles and responsibilities for responding to and/or recovering from long-term power outages, will also benefit from the material in this annex.

[1] https://www.dhs.gov/xlibrary/assets/foia/mgmt_directive_110421_safeguarding_sensitive_but_unclassified_information.pdf

Document Change Control

Version	Date	Summary of Changes	Name

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Overview

Introduction

Response to a long-term power outage will involve two major concurrent operational efforts: the restoration of power and lifesaving and life-sustaining efforts. Restoration of power will remain within the purview of the utility companies. If a need for federal engagement for energy restoration efforts arises, the Department of Energy (DOE), as the sector risk management agency (SRMA) as well as the lead federal agency for the energy sector, coordinates federal support of those efforts. The utility companies maintain operational control over restoration efforts.

Concurrently, the Department of Homeland Security (DHS), through the Federal Emergency Management Agency (FEMA), will coordinate lifesaving and life-sustaining efforts. FEMA will use the Response and Recovery Federal Interagency Operational Plan (FIOP) to integrate and deliver response and recovery functions and core capabilities identified within the National Response Framework (NRF) and the National Disaster Recovery Framework (NDRF). The federal government shall coordinate and integrate its efforts with the appropriate SLTT, private sector, and non-profit partners.

The nation's energy sector consists of thousands of geographically dispersed, yet connected, electricity, oil, and natural gas assets positioned throughout the United States (U.S.). The energy sector provides for, and relies upon, other critical infrastructure (CI) systems such as transportation, water, communications, and financial. The private sector owns and operates most of the nation's energy infrastructure. For this reason, private sector energy asset owners and operators are responsible for developing their own emergency plans and conducting training and exercises to validate and test their procedures. In most cases, energy asset owners and operators are also responsible for the stabilization, restoration, and reestablishment of normal operations at their facilities following a disruption. Electric companies in the United States have well-developed protocols that address business continuity, and they are subject to mandatory federal reliability standards to ensure operational reliability. Although utilities operate under different business models and ownership structures, asset owners and operators function in a relatively integrated manner.

Electricity has become critical for modern daily life in the United States and around the world. Basic functions, including communication, transportation, food, housing, water, and healthcare, are dependent upon electricity, and a significant disruption to the electric grid may put lives, the economy, and the environment in danger.

The sampling of incidents below illustrates how power outages have previously affected services requiring additional response and recovery assets:

- **August Northeast Blackout, 2003** – Over 50 million people were without power for up to 4 days in the Midwest and Northeastern United States. Parts of the Province of Ontario, Canada, suffered rolling blackouts for more than a week before power was fully restored.

- **Hurricane Katrina, 2005** – In August, Hurricane Katrina left an estimated 2.7 million customers without power across Alabama (AL), Florida (FL), Louisiana

(LA), Mississippi (MS), and Texas (TX). Within 2 weeks, power was restored in AL, FL, and MS, yet full restoration in LA took almost another month due to extensive flooding and hurricane damage that required reconstruction of energy and other supporting infrastructure.

- **Derecho, 2012** – This June storm resulted in power outages for 4.2 million people in 11 states and the District of Columbia. Power was restored within one week. Restoration took longer than anticipated because new follow-on storms affected the region during the second day of restoration, causing additional outages, slowing restoration, and setting back original estimates. Extreme temperatures that followed the 2012 derecho may also have complicated restoration efforts for many utilities, as the high heat posed a safety risk to utility crews and lowered restoration effectiveness.

- **Hurricane Sandy, 2012** – In October 2012, 20 states plus the District of Columbia experienced significant power outages because of Hurricane Sandy. Over 8.5 million customers lost electric power and significant damage occurred to the energy infrastructure. Within two weeks of Sandy's landfall, power was restored to 99 percent of customers.

- **Hurricane Maria, 2017** – In September, Maria landed just south of the U.S. Virgin Islands (USVI) as a Category 5 hurricane before arriving to Puerto Rico as a slightly weakened but much larger storm. In the aftermath of the storm, 3.7 million Puerto Ricans were without electricity. The devastation resulted in the longest sustained air mission of food and water delivery in FEMA history.

As shown in the above examples, utilities are fully prepared to respond quickly to restore power for most disruptions that occur by using existing processes and agreements. However, there is a potential for large-scale damage to the power infrastructure that may cause a long-term (+72 hours) interruption for a large portion of the country. Any prolonged interruption of the supply of basic energy, particularly electricity, would do considerable harm to the U.S. economy and the American people. A long-term outage could leave the population in need of lifesaving and life-sustaining efforts.

When a power outage is of such significance and scope that it is beyond the ability of utility companies to restore power in a timely manner, the federal government may be requested to aid jurisdictional response and recovery capabilities. A situation that may trigger the need for SLTT to request federal assistance discussed in this annex will likely possess some or all the following characteristics:

- The outage covers multiple states/FEMA regions and leaves millions of citizens without power for an extended period.

- A significant portion of the population in the affected area warrants prolonged mass care and emergency assistance support.

- A loss of critical lifeline functions (e.g., energy – electric, energy – gas/oil, water, communication, and transportation) results in risks to health, personal safety, national security, and economic viability.

- Impacts to other CI sectors result in significant loss of services or functions if the duration of the power outage is for an extended period.

Purpose

The *Power Outage Incident Annex* (POIA) provides guidance for federal-level responders to provide response and recovery support to SLTT efforts regarding the unique qualities of a power outage response. This annex provides incident-specific supplemental information to the basic concept of operations described in the Response and Recovery FIOP.

The POIA details the federal government's communication and coordination structures that will be implemented to execute survivor-centric response and recovery operations in the wake of a long-term power outage. The POIA is not an electricity restoration plan, although the federal government may provide the appropriate supplemental federal assistance and resources to enable the restoration process in a timely manner. It outlines the types of federal support available to CI stakeholders in restoration activities. This document also identifies potential critical information requirements and unique considerations that could hinder the federal government's ability to provide mission-essential services to areas impacted by a power outage.

The POIA does not alter or impede the ability of any governmental department or agency to execute its authorities or meet its responsibilities under applicable laws, executive orders, and directives.

Scope

This annex applies to response and recovery capabilities of the federal government if a long-term power outage occurs in which the cascading impacts are so severe that federal assistance is required. Potential actions listed in this annex include providing support to SLTT entities. This annex does not focus on restoration efforts conducted by utility companies but addresses the communication and coordination capabilities of the federal government to support the sector in their restoration efforts.

Incident-specific response and recovery activities were determined based on the identified interdependencies and cascading impacts a long-term power outage would have on CI sectors and core capabilities and the relevant responsibilities and legal authorities of federal agencies.

Background

The electric power industry is the backbone of America's economic sectors, supplying the energy required for all industries and sectors in the United States. Reliance on the electric grid is a key interdependency (and vulnerability) among all CI sectors and supporting infrastructures, making grid reliability and resilience a fundamental need for national safety and security. This document provides a basic understanding of the roles and responsibilities of electricity providers to set expectations of potential federal support.[2] See Annex A: Electricity Delivery for more information on the electricity subsector and electricity delivery.

[2] While the intent is not to use this annex for every incident in which there is a power outage, elements of this annex may be selectively used (e.g., critical information requirements) consistent with the principles in the NRF.

Over 3,200 electric companies in the United States generate, transmit, and distribute electricity for sale to customers. There are two types of utilities—for-profit and not-for-profit, as identified below.

For-Profit Utilities

- Investor-Owned Utilities (IOUs) – IOUs are utilities operated as private businesses whose management is not associated with any government agency. Private citizens or private investment groups hold financial securities or assets and the stock is publicly traded. IOUs may have service territories in one or more states. State commissions grant IOUs their licenses to operate in specific areas of the state under certain terms and conditions. The Federal Energy Regulatory Commission (FERC) regulates IOU interstate generation, transmission, and power sales. A state commission or public utility commission regulates IOU distribution systems and retail sales. While IOUs comprise only a small portion of the total number of utility companies in the United States, they serve more than two-thirds of the nation's population.

- **Independent Power Producer** – Often called non-utility generators, independent power producers are entities that own or operate an electricity-generating facility that is not included in an electric utility's rate base. They include, but are not limited to, cogenerators, small power producers, and all other non-utility electricity producers (such as exempt wholesale generators) who sell electricity.

Not-For-Profit Utilities

- **Public Power Utilities**– Public power utilities are not-for-profit utilities owned and operated by state or local governments or by agencies, authorities, or instrumentalities of such governments. City-owned utilities are also known as municipal utilities (munis). Public power utilities are regulated and governed by locally elected or appointed officials and are thus directly accountable to the communities they serve. Within the United States, more than 2,000 community-owned electric companies serve more than 48 million people, or about 14 percent of the nation's electric companies.[3]

- **Rural Electric Cooperatives (Co-Ops)** – Electric co-ops are private, independent, not-for-profit electric utilities owned by the customers they serve. They are incorporated under the laws of the states in which they operate and are generally exempt from federal income tax laws. Established to provide at-cost electric service, co-ops are governed by a board of directors elected from the membership, which sets policies and procedures that the co-op's management implements. Distribution cooperatives deliver electricity to retail customers, while generation and transmission cooperatives provide wholesale power to distribution co-ops through their own generation or by purchasing power on behalf of the distribution members. Co-ops tend to provide service in rural areas that are not served by other utilities. Most electric cooperatives were initially financed by the Rural Utilities Service (formerly known as the Rural Electrification Administration) within the

[3] American Public Power Association website. http://publicpower.org/.

United States Department of Agriculture (USDA).

- **Federal Power Program** – This program includes the Tennessee Valley Authority (TVA), the Bonneville Power Administration (BPA), the Southeastern Power Administration (SEPA), the Southwestern Power Administration (SWPA), and the Western Area Power Administration (WAPA). TVA is a corporate agency of the United States that sells electricity to business customers and local power distributors serving 9 million people in parts of 7 southeastern states. BPA, SEPA, SWPA, and WAPA are Power Marketing Administrations (PMAs). PMAs are federal agencies within DOE that market hydropower primarily from multiple-purpose water projects operated by the Bureau of Reclamation, the U.S. Army Corps of Engineers (USACE), and the International Boundary and Water Commission.

Interdependencies

Key interdependencies exist among the 16 CI sectors, as denoted in Table 1. The energy sector provides essential power and fuels upon which all other CI sectors depend. In turn, the energy sector depends upon other CI sectors, such as transportation, information technology (IT), communications, water, and government facilities, to help provide its services. For example, the transportation sector relies upon fuel for its operation and the energy sector relies upon transportation for fuel delivery.

In addition to multiple cross-sector interdependencies, interdependencies also exist within the energy sector itself, which can further complicate the restoration of power. For instance, the increasing demand for natural gas to generate power has served to heighten the interdependence between gas and electric systems. Natural gas is used heavily in electricity generation and electricity is necessary throughout the natural gas supply chain, including at production, pipeline, processing, and distribution facilities. In addition, supervisory control, and data acquisition systems (SCADAs) and energy management systems which provide data, monitor, and control equipment and processes essential to energy industry operations, both require reliable power supplies to function.

Since energy systems and networks also transcend national boundaries, cross-border collaboration, information sharing, mutual assistance, and other agreements are necessary to ensure reliable operations. For additional information on these relationships, impacts from a power outage, critical information requirements, and potential decisions for each CI sector, refer to Appendix 2: Critical Infrastructure Sector Interdependencies.

Table 1: CI Sector Interdependencies

Critical Infrastructure Sector	Energy Sector Reliance on CI Sector	CI Sector Reliance on Energy Sector
Chemical	Chemical products to extract coal or perforate gas and oil wells; petrochemicals	Chemical manufacturing
Communications	Voice and data services for management, response, and restoration activities	Facility power for voice and data services and distributed in-line network equipment

Critical Infrastructure Sector	Energy Sector Reliance on CI Sector	CI Sector Reliance on Energy Sector
Commercial Facilities	Lodging and feeding of restoration workers	Facility service
Critical Manufacturing	Manufacturing and control logistics; transportation; supply chain integrity	Supply chain
Dams (hydroelectric)	Energy source	Station service
Defense Industrial Base	Manufacturing and control logistics; transportation; supply chain integrity	Military bases and defense production facilities
Emergency Services	Facility security and incident management	Facility power; communications; database use
Energy	Electricity generation fuel source; backup generators; service vehicle fuel; station service	Fuel production and transportation (pumping); station service
Financial Services	Financial institutions, funds transfers	Deposits; consumer credit; payment systems products
Food and Agriculture	Retail food and food service	Agricultural production; food manufacturing, processing, distribution, storage, transportation, retail, and food service
Government Facilities	Government functions	Facility service
Healthcare and Public Health	Facility and community-based patient and staff well being	Facility service; community-based individuals with power dependent durable medical equipment or devices
Information Technology	Automated tools	Facility service
Nuclear Reactors, Materials, and Waste	Electricity generation fuel sources	Station service, including safety systems
Transportation Systems	Fuel sources; equipment transportation	Communications; control systems; operations
Water and Wastewater	Electricity generation cooling	Water treatment; pumping and distribution

Power Outage Hazards and Threats

Power outages of this magnitude may be the result of a natural disaster, space weather, large near-earth object, accident, terrorist acts such as an electromagnetic pulse (EMP) or significant cyber incident.[4] This annex remains source agnostic as to the cause of the power outage and focuses on consequence management of post-power outage lifesaving and life-sustaining actions. This annex may be implemented in conjunction with other incident annexes, and when appropriate, counterterrorism and law enforcement operations are conducted in coordination with federal incident response and recovery operations.

[4] Pursuant to *Presidential Policy Directive 41, United States Cyber Incident Coordination*, a significant cyber incident is a cyber incident that is (or group of related cyber incidents that together are) likely to result in demonstrable harm to the national security interests, foreign relations, or economy of the United States or to the public confidence, civil liberties, or public health and safety of the American people.

Facts, Planning Assumptions, and Critical Considerations

In addition to the hazards and threats posed to critical lifeline sectors in the event of a significant grid disruption, it's vital to consider how a prolonged power outage would affect those living in and around the impacted areas due to cascading effects. These issues must be factored into the planning assumptions and critical considerations specific to a long-term power outage and are intended to supplement those listed in the Response and Recovery FIOP.

Facts

If a power outage affects the United States for an extended period, the following facts drive planning:

- The private sector owns and operates most of the national power system.
- The implications of prolonged power loss leads to cascading secondary and tertiary effects, like increasing suffering on survivors and causing increased complexity of restoration efforts for responders.
- All utilities, regardless of ownership, size, or structure, have emergency plans and contingency plans for short-term power outages.
- Damage to energy generation capabilities will result in a longer restoration timeframe than if there is just damage to certain transmission or distribution capabilities.
- Damage to components of the electric transmission system could delay power restoration efforts and cause longer estimated restoration timelines than a loss of a generation asset, especially if the damaged component is limited in supply or requires time-consuming logistical support and installation.
- The Federal Power Act provides regulatory jurisdiction over wholesale bulk power whereas states regulate the retail sale of power to customers at the distribution level.
- Lack of power will create challenges to providing consistent heat or air conditioning and sufficient sanitation/hygiene in shelter or other mass care facilities.
- People with disabilities comprise about 20 percent of the national population, and people with access and functional needs generally comprise about 30 to 50 percent of the population.
- The availability or shortage of redundant, accessible, and diverse communications will affect response and recovery operations.
- The federal government has a limited organic generator capability.

Planning Assumptions

In absence of fact, planning assumptions represent information presumed to be true and are necessary to facilitate planning. Assumptions are a baseline for planning purposes and they do not replace specific activities or decision points that would occur during an incident. During response and recovery operations, assumptions may become facts.

Certain assumptions pertaining to a long-term power outage are predicated on historical experiences or modeling. They include, but are not limited to the following:

General Assumptions

- Due to the duration of the outage, normal resources and processes for support to impacted populations are not sufficient.
- A large-scale or long-term power outage with significant consequences requiring interagency coordination is likely to be caused from a Stafford Act incident.
- Millions of customers and/or multiple states or FEMA regions may be impacted.
- If an additional incident occurs during a long-term power outage, it will compound the effects of a power outage and the timeline for restoration of power.
- Federal response and recovery capabilities will be in limited supply, forcing resource prioritization decisions.

International Assumptions

- Due to the United States' dependency on cross-border flows of energy resources to meet its total energy requirements and global flows of information, knowledge, and investment capital, a long-term power outage will have international implications.[5]
- A detailed description of the unique attributes of an international, or outside the contiguous United States (OCONUS) response is detailed in the OCONUS Appendix.

Mass Care/Emergency Services Assumptions

- Transportation limitations and supply chain disruptions make it difficult to open shelters, prepare food, distribute food and emergency supplies, and provide means for reunification services.
- Relocation of populations may occur if the power outage lasts for a significant period.
- A portion of the population has access and functional needs and is power dependent on medical equipment, devices, and services outside hospital settings and must be supported during outages.

[5] *Energy Sector-Specific Plan*, 2015, pg. 22.

- Extremely hot or cold weather conditions will greatly increase the number of survivors unable to shelter at home during a prolonged outage.

Power Restoration Assumptions

- Physical damage to electricity infrastructure may not be the primary hindrance to the restoration of power (e.g., power generation capabilities may be impaired due to a cyber incident).

Public Health and Medical Assumptions

- Critical healthcare facilities and sites such as hospitals may have difficulty maintaining sufficient temporary emergency power and will face stress from a surge in care needs and potential degradation of services.

Supply Chain Assumptions

- Supply chains will be disrupted, affecting availability of resources.
- The Defense Production Act (DPA) may be used at the discretion of federal agencies with the appropriate authority to expedite procurement and allocation of critical materials, services, and facilities as needed or appropriate to respond to or recover from a power outage.

Critical Considerations (for Crisis Action Planning)

Critical considerations pertaining to the unique circumstances of a long-term power outage include, but are not limited to the following:

General Considerations

- Power operations outside the outage areas may be limited or degraded.
- Impacts to tribal lands and access for restoration activities may present unique challenges that require understanding of specialized authorities or approaches.
- The U.S. government and states interconnected and affected by the power outages must coordinate restoration efforts as well as the issuance of emergency orders to the electric industry and utilities based on jurisdictional boundaries and limitations within the federal and state laws.
- Mutual aid resources among investor-owned, public power, and cooperative utilities may be overextended.
- Water and wastewater operations will be hindered and affect the delivery of some key services.
- Lack of preparation for people who depend on power to sustain life or to maintain quality of life, health, safety, and independence unnecessarily places people who need assistance in a higher category of risk and increases likely rescue and response requirements.

Agriculture and Natural Resources Considerations

- Animal and agriculture operations (including agriculture, aquaculture, zoos, aquariums, animal research facilities, and animal breeding and sheltering facilities) rely on power for the provision of food and water to animals and to ventilate, maintain inside temperature, and remove waste products from animal housing areas.

Continuity of Operations and Government

- Robust continuity programs and capabilities mitigate impacts to the performance of essential functions, core capabilities, and critical services, as well as expedite the recovery and full resumption of impacted operations.
- Public and private sector organizations impacted by long-term power outages will require the activation of continuity plans to sustain essential functions and provide critical services to the affected population and to ensure continuity of government at all levels.
- Federal or state, local, Tribal Nations, territorial government essential functions performed from primary or alternate locations will rely on backup power support, which may be limited.
- Decision-making and coordination processes among government officials and with the heads of public and private critical infrastructure sectors and other non-government organizations are necessary to ensure support to response and recovery efforts. This coordination will require resilient communications capabilities.

Economic Considerations

- Economic impacts may not be initially apparent but may appear over a longer period and last for months or years. As a result, the federal government may provide long-term recovery assistance for months or years at an enormous cost. (Refer to the NDRF for specific types of long-term recovery assistance that may be available.)
- Individuals affected by the incident and by evacuation orders may be cut off from income and will need social services support.

Fuel/Generator Considerations

- Fuel will need to be prioritized for distribution and use based on requirements, such as the number of available generators, number of CI facilities requiring fuel or generators, and fuel consumption.
- The provision of temporary emergency power to a CI facility is not the sole factor in returning the facility to normal operating status (e.g., lack of supplies, time to restart operations).
- Even with adequate fuel stocks, distribution and delivery shortfalls may still limit the ability to refuel in place.

- The failure rate of backup generators will increase to approximately 15 percent after 24 hours of continuous use.
- Backup generators at some CI facilities may not be tested frequently or maintained consistently, which may result in equipment failures.
- Diesel fuel stored for more than 12 months begins to form sediments and gums. Diesel fuel used after it has exceeded its shelf life will increase the likelihood of damage to the generator.
- Use of points of distribution (PODs) may not be a feasible approach for providing fuel to critical CI facilities at fixed locations. As a result, a fuel delivery strategy will need to consider daily fuel transportation requirements.

Mass Care/Emergency Services Considerations

- Power support will be needed for selective delivery of emergency services to high-density areas or populations of people who need assistance evacuating.
- The public may have difficulty reaching 9-1-1 emergency services if communications backup battery-powered systems fail due to an extended loss of electricity.
- Large numbers of survivors in areas where power outages are projected to be long term may relocate to areas where power and resources are available. Therefore, people whose homes are not damaged may require housing assistance and coordination with the private sector for innovative accessible housing solutions.
- A decision to evacuate large populations to an area out of the impacted area could require significant resources.
- Temporary housing assistance may be required for essential personnel in impacted areas who cannot stay in their own homes.

Public Health and Medical Considerations

- Healthcare services typically operate on just-in-time inventory, which may adversely affect patient care.
- Individuals who rely on durable medical equipment and implantable devices requiring either electric power or battery recharging may lose their life-sustaining independence and overwhelm healthcare facilities if the power is out for more than a few days.
- Dialysis centers generally do not have backup generators, but often operate within a network and may shift patients to other local network facilities if they have power, essential medical staff and patient public and accessible transportation services are available, and costs are not prohibitive.
- Health systems must plan for crisis standards of care and scarce resource utilization during mass power outages.

- A segment of the population in the United States operates power-dependent durable medical equipment and, as a result, is unable to self-relocate during a mass power outage.

Law Enforcement Considerations

- Actual criminal activities and rumored lawlessness will contribute to public safety fears, which may affect response and recovery efforts.
- The loss of power and impacts on communications, financial services, food, and water will attract certain criminal activities (i.e., theft and looting). Law enforcement officers will need to establish and visibly demonstrate a robust law enforcement presence.

Mission

The desired end state for response and recovery during a long-term power outage includes the following:

- Federal lifesaving and life-sustaining assistance to SLTT entities is completed.
- Basic services, public safety, and community functionality are restored, and long-term recovery measures are in place to enable full restoration of power and the economy.
- Displaced populations have returned home or have been relocated to permanent accessible housing.
- The logistics supply chain for mass care/emergency assistance and life-sustaining support to survivors and infrastructure restoration missions can meet demand.
- Measures are in place to enable full revitalization of power systems, to include sustainability and resilience enhancements, where feasible.
- Economic and business activities are returned to a healthy state.
- Health and social services systems are restored to promote the resilience, health (including behavioral health), independence, and well-being of the whole community.
- Public safety and health protection assurances have been made.
- Environmental impacts are mitigated.
- National essential functions and all primary mission essential functions are restored.[6]
- Resource requirements for sustainable asset owner CI operations have been sufficiently met for reliable power delivery.
- Management of federal long-term recovery support shifts to the appropriate steady state managers (e.g., regional, district, or similar local office).

[6] Per *Presidential Policy Directive 40, National Continuity Policy*, National Essential Functions (NEFs) refer to the subset of national functions that are necessary to lead and sustain the nation during a catastrophic emergency. Primary Mission Essential Functions refer to those federal government functions that must be performed to support or implement the performance of NEFs before, during, and in the aftermath of an emergency.

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Execution

When the overall coordination of federal incident response and recovery activities is required, per Homeland Security Presidential Directive 5 (HSPD-5), the Secretary of Homeland Security coordinates with federal entities to provide for federal unity of efforts for domestic incident management. The FEMA Administrator, as the principal advisor to the President, the Secretary of Homeland Security, and the Homeland Security Council regarding emergency management, assists the Secretary in carrying out Stafford Act response and recovery operations. Other federal departments and agencies carry out their responsibilities consistent with applicable policy and statutory authorities.

Concept of Operations

Federal response and recovery support for a long-term power outage will require a coordinated effort involving SLTTs, infrastructure private partners, and non-profit entities. State and local governments are encouraged to coordinate with federal efforts, yet maintain their own logistical support when possible in accordance with applicable authorities and requirements. The concept of support is consistent with Response and Recovery FIOP principles.

The premise for this annex is that a power outage affects multiple areas and leaves millions of citizens without power for an extended period. Some areas are more likely to get power restored in a few weeks, but the overall outage will last much longer in other areas.

Therefore, federal support to SLTT governments in a long-term power outage will follow a triage approach, applying limited resources to achieve the most positive impact for the largest number of people.

- Resources will maintain infrastructure in areas where power is expected to be restored in 2 weeks or less. This will reduce the cascading impacts of power loss, maintain, or facilitate quicker restoration of essential services, and prepare regions to accept survivors self-evacuating from areas suffering long-duration outages.

- In tandem with these activities, emergency resources and services will be selectively delivered to areas with the longest projected duration of power loss that have a high population density or a significant number of survivors who either choose not to self-evacuate or need assistance with evacuating.

For most incidents meeting the assumptions of this annex, federal government core capabilities and resources will be initially prioritized to meet following objectives:

- Facilitate power restoration and maintain other CIs within geographic regions where it is anticipated that power will be restored in 2 weeks or less.

- Stabilize and sustain CIs in geographic regions that suffer the next shortest duration of power outages.

- Provide mass care services and resources to support states and Tribal Nations conducting the mass evacuation of survivors, including people with disabilities and those with access and functional needs.[7]
- Provide mass care/emergency assistance services to those self-evacuating.
- Selectively deliver emergency services to high-density areas or vulnerable populations who are unable to evacuate.
- Provide law enforcement support to establish and maintain public safety and security to ensure a safe environment for infrastructure restoration.

As part of the crisis action planning process during an actual long-term power outage, this course of action and these priority objectives will be reviewed and refined based on the particulars of the incident.

Tiered Response

This annex is founded on the principle of tiered response or the understanding that most incidents are handled at the lowest possible jurisdictional level. As resources and capabilities are exceeded, additional SLTT and federal assets are applied. In the case of the electricity industry, restoration starts with the electric companies.

A key component of tiered response is mutual aid and assistance. Local communities and states have mutual aid compacts in place to share critical resources across jurisdictional boundaries in a timely manner. Likewise, companies in the electric industry have formal agreements with one another to share resources as the capabilities are exceeded.

Private and Public-Sector Utility Assistance

Each segment of the electric industry is prepared to assist for national-level catastrophic incidents. As such, the electric industry has a tiered response structure that evolves from small, localized incidents to larger incidents requiring support from neighboring or regional utilities to incidents that require national support and oversight. For example, Edison Electric Institute (EEI), an association of investor-owned electric companies, has developed a formal designation of National Response Event (NRE) to explain a natural or man-made event that is forecasted to cause or that causes long-term power outages affecting a significant population or several regions across the United States and requires resources from multiple regional mutual assistance groups. The term NRE is unique to the members of EEI, but the general principle of regional mutual aid and the elevation of incidents applies across the various utility companies, municipally owned electric systems, and co-ops.

Top priorities for the electricity subsector include:

- Identifying and leveraging mutual aid resources.
- Coordinating and deploying response resources in a safe, efficient, and equitable manner.

[7] It is important for preparedness planning to account for inclusive accessible transportation for evacuation and to ensure individuals with communications and physical access barriers are taken into consideration.

- Providing public messaging (in accessible and alternate formats, when possible).
- Responding with unity of effort.

When there is an electrical outage that affects large portions of the nation, the utility companies use their internal coordination mechanisms to identify requirements and organize mutual aid.

Mutual assistance is an essential part of the electric power industry's service restoration process and contingency planning. Electric companies impacted by a major outage event can increase the size of their workforce by "borrowing" restoration workers from other utilities.

Below are some examples of mutual aid assistance compacts and national programs to assist energy sector owners and operators in sharing or procuring equipment and assistance in a disaster.

- **American Public Power Association (APPA) Mutual Aid Network** – Formalized in 2013, APPA leads the Mutual Aid Network for public power utilities, state associations, and joint action agencies. The Public Power Mutual Aid Playbook includes a national mutual aid agreement signed by more than 2,000 public power utilities and rural electric cooperatives, connecting utilities so they can help each other in times of need. Each of the 10 APPA regions, which match the 10 FEMA regions, has appointed a Public Power Network Coordinator to each state who works with utilities in relevant regions on coordinating support. The network ensures a coordinated response with state and federal government officials and outlines roles and responsibilities of utilities, Network Coordinators, and National Coordinators. In steady state, APPA's Mutual Aid Working Group (MAWG) works to refine plans and procedures to enhance preparedness response.
- **Investor-Owned Electric Company Mutual Assistance** – The nation's investor-owned utilities, who are members of EEI, coordinate their mutual assistance efforts at a regional level through seven Regional Mutual Assistance Groups (RMAGs). Some RMAGs also have municipal and cooperative utilities as members. When a member determines that it needs restoration assistance, it initiates a request through an RMAG. When an RMAG is unable to meet its resource needs, it can coordinate with adjacent RMAGs to obtain additional mutual assistance restoration resources. Following a power outage that requires a national response and upon request from an EEI chief executive officer, all RMAGs are activated and all of the available resources will be allocated at the national level using EEI's NRE Framework.[8] A National Response Executive Committee, consisting of senior-level member company executives from all regions of the country, will determine if an NRE activation is warranted and will activate EEI's National Mutual Assistance Resource Team (NMART). The NMART evaluates mutual assistance requests and assigns available resources to affected companies in coordination with the RMAGs.

[8] https://www.eei.org/issues-and-policy/reliability-emergency-response

- **Electric Cooperative Mutual Assistance Network** – Rural electric cooperatives adhere to the principal of Cooperation Among Cooperatives.[9] The backbone of the Electric Cooperative Mutual Assistance Network is the collective of statewide organizations that operate in virtually all 47 states in which electric cooperatives serve. The statewide organizations are the conduit through which individual electric cooperatives request and receive help, as well as make offers of assistance to their fellow cooperatives. The National Rural Electric Cooperative Association (NRECA), the national organization representing electric cooperatives on federal regulatory and legislative issues, developed a Mutual Assistance Agreement in collaboration with APPA. This document forms the basis for providing mutual assistance between and among electric cooperatives and municipally owned electric systems. As needed, the statewide organizations activate the Cooperative Mutual Assistance Network and conduct conference calls to discuss requirements and mutual aid support.

- In 2006, the FERC approved the **Spare Transformer Equipment Program (STEP)**, an electric industry program that strengthens the sector's ability to restore the nation's transmission system more quickly in the event of a terrorist attack. Any electric utility that owns transformers in the United States or Canada, including an investor-owned utility, a government-owned utility, or a rural electric utility, is eligible to participate in the program.[10] Under the program, each participating electric company is required to maintain a specific number of transformers. STEP requires each participating utility to sell its spare transformers to any participating utility that suffers a "triggering event" (such as an act of terrorism that destroys or disables one or more substations and results in the declared state of emergency by the President of the United States). In addition to the investor-owned STEP program, several other spare transformer programs and many bilateral and multilateral agreements are in place between utilities for spare transformer sharing and leveraging.

- **SpareConnect** – The SpareConnect Program provides an additional mechanism for Bulk Power System (BPS) asset owners and operators to network with other SpareConnect participants concerning the possible sharing of transmission and generation step-up transformers and related equipment. SpareConnect establishes a confidential, unified platform for the entire electric industry to communicate equipment needs. This program does not create or manage a central database of spare equipment; it provides decentralized access to points of contact at power companies to enhance cooperation and resiliency.

- **GridAssurance™** is an independent organization formed by six energy companies that provides subscribers with a readily available inventory of equipment at secure, strategically located warehouses in the United States. The company also offers logistics support to facilitate expedited delivery of the equipment to affected sites

[9] The Seven Cooperative Principals are Voluntary and Open Membership; Democratic Member Control; Members' Economic Participation; Autonomy and Independence; Education, Training, and Information; Cooperation Among Cooperatives; and Concern for Community.

[10] *Order on Application for Blanket Authorization for Transfers of Jurisdictional Facilities and Petition for Declaratory Order*, September 22, 2006.

following a qualifying event. Subscription to GridAssurance's inventory and services is open to all transmission owners.

State-to-State Assistance

State and local governments have a unique role in energy assurance because they represent the front lines of protection and the face of public services to citizens during an emergency. They also have a primary responsibility to coordinate with and make recommendations or requests to industry partners on prioritizing restoration of electric service to critical facilities. Public power utilities have local, state, and regional contracts and agreements to render mutual aid. If additional state-level resources are required, the state will generally request assistance from other states by using interstate mutual aid and assistance agreements such as the Emergency Management Assistance Compact. The governor of any state impacted directly or indirectly by the consequences of a long-term power outage may activate elements of the National Guard to support state domestic civil support functions and activities.

Requesting Federal Assistance

When an incident overwhelms or is anticipated to overwhelm state resources, the governor or chief tribal executive may request federal assistance from the President. In such cases, the affected SLTT area and the federal government will collaborate to provide the necessary assistance.

Federal Support

Federal support for the impacts from a long-term power outage depends on a variety of factors including, but not limited to, the following:

- Whether a major disaster or emergency declaration has been issued by the President.
- The capability and resources of public and private utilities, as well as SLTT governments in the affected areas.
- Federal agency operational agreements with states.
- Availability of organic federal resources and private sector resources which the federal government relies upon.
- Statutory authorities and parameters consistent with the adjudication process (case-by-case basis).
- Magnitude and duration of the outage (e.g., number of persons affected combined with length of time without power, number and type of CI affected, projected length of outage).
- Specific federal department and agency roles and statutory authorities.

When a long-term power outage occurs and exceeds SLTT capacities, it is anticipated that SLTT executives will seek federal assistance under the Stafford Act. The Stafford Act authorizes the President to provide financial and other disaster and emergency assistance to

SLTT governments. The specific types of assistance under the Stafford Act that the Federal Government may provide depend on a variety of factors, including whether utilities are publicly or privately owned within the impacted communities.

- **Investor-Owned or For-Profit Utilities** – The private sector owner and operator is the primary entity responsible for all power restoration requirements. The federal government does not provide support to investor-owned for-profit utilities under the Stafford Act. However, in rare instances and on a case-by-case basis, the federal government may provide certain support to investor-owned for-profit entities for an exceptionally limited period for lifesaving or life-sustaining missions at the request of an SLTT government. The federal government may consider regulatory relief for private institutions and should synchronize its operations to enable, support, and otherwise not contradict private sector restoration operations.

- **Municipal, Cooperative, or Not-For-Profit Utilities** – In addition to federal support to survivors and their communities, the federal government may aid the public utility through the applicable SLTT to enable its power generation and distribution requirements and support restoration operations. These utilities are eligible for public assistance under the Stafford Act. While restoration of power is the responsibility of electric companies, the federal government may be requested to provide services to enable the power restoration process, as well as the delivery of essential services, through the facilitation of policy decisions and resource prioritization. Examples of federal support that may be provided include, but is not limited to, the following:

    - Enforcement of road closures, public safety, and security at access points.
    - Debris removal (if warranted) to enable utility companies to access damaged equipment more quickly.
    - Coordination with all CI sectors to understand the interdependencies with the electricity subsector and resulting cascading effects on other sectors and businesses.
    - Logistical support for mass care and emergency assistance services and power generation equipment to enable continuity of essential services.
    - Employment of the DPA, as required.

Coordination of Federal Support

The principles in the NRF and NDRF, and the actions in the Response and Recovery FIOP, are the primary mechanisms to coordinate the federal government's response and recovery to terrorist attacks, major disasters, and other emergencies. As such, they form the basis of federal support to the impacts from a power outage. Nothing in these documents alters or impedes the ability of government departments and agencies to carry out their specific authorities or perform their responsibilities under all applicable laws, executive orders, and directives. Individual federal departments and agencies have responsibilities for various aspects of a coordinated federal response to a power outage.

- **Department of Homeland Security** – The Secretary of Homeland Security is the principal federal official for domestic incident management. Pursuant to the Homeland Security Act of 2002, the Secretary is responsible for coordinating federal operations within the United States to prepare for, respond to, and recovery from terrorist attacks, major disasters, and other emergencies. The Secretary coordinates with federal entities to provide for federal unity of efforts for domestic incident management.

The FEMA Administrator is the principal advisor to the President, the Secretary of Homeland Security, and the Homeland Security Council regarding emergency management. The FEMA Administrator's duties include assisting the President, through the Secretary, in carrying out the Stafford Act; operating the National Response Coordination Center (NRCC); effectively supporting all Emergency Support Functions (ESFs) and Recovery Support Functions (RSFs); and, more generally, preparing for, protecting against, responding to, and recovering from all-hazards incidents.

- Within DHS, the Cybersecurity and Infrastructure Security Agency (CISA) serves as the federal coordinator of SRMAs and CI.

- **Department of Energy** – DOE is the SRMA and lead federal agency for the energy sector. DOE is also responsible for coordinating the energy sector's emergency preparedness requirements. Under the authority of the Secretary of Energy, DOE directs ESF #12 – Energy activities for the energy sector under the NRF. Additionally, DOE is responsible for leading, facilitating, or supporting the security and resilience programs and associated activities of the energy sector in the all-hazards environment and coordinating the preparation and implementation of the Energy Sector-Specific Plan as an annex to the National Infrastructure Protection Plan (NIPP). The Secretary of Energy is responsible for helping to acquire equipment and trained personnel for the energy sector from other nations as appropriate and for sector coordination with North American partners in Canada and Mexico. Under the 2015 Fixing America's Surface Transportation (FAST) Act (Public Law [P.L.] 114-94), the Secretary of Energy is authorized to order emergency measures to protect or restore the reliability of critical electrical infrastructure or of defense critical electric infrastructure upon a presidential finding of a Grid Security Emergency. This authority allows DOE to support the energy sector for and respond to cyber, electromagnetic pulse, geomagnetic disturbance, and physical attack threats.

- **Department of State (DOS)** – DOS is responsible for all communication and coordination between the U.S. government and other nations regarding the response to a domestic crisis. Consistent with the International Coordination Support Annex to the NRF, DOS may also be required to assist private industry during a domestic incident by expediting specifically requested equipment, goods, or trained personnel to enter the United States and assist with non-energy related assistance.

- **Department of Defense (DOD)** – DOD is responsible for providing military forces and certain intelligence capabilities to deter war and to protect the security

and national interests of the United States. The Secretary of Defense may assist in the support of domestic infrastructure and essential government services or, at the direction of the president and in coordination with the attorney general, the maintenance of civil order or law enforcement in accordance with applicable law. The Secretary of Defense will retain command of Title X military forces providing support.

- **Other Federal Departments and Agencies** – Various federal departments or agencies have primary, coordinating, or support roles in delivering response and recovery core capabilities. Some departments also serve as SRMAs for a CI sector. In some circumstances, other federal agencies may have a lead or support role in coordinating operations, or elements of operations, consistent with applicable legal authorities. For all incidents, to include a long-term power outage, federal department and agency heads serve as advisors for the Executive Branch relative to their areas of responsibility.

- Several federal departments and agencies have authorities to respond to and declare specific types of disasters or emergencies. These authorities may be exercised independently of, concurrently with, or become part of a federal response coordinated by the Secretary of Homeland Security.

Appendix 4: Roles and Responsibilities provides a detailed list of unique power-related responsibilities for all members of the whole community.

International Support

The energy sector relies on the import of critical technologies and equipment, such as large power transformers (LPTs), as well as many key raw materials that are essential to the manufacturing of certain electrical infrastructure. As such, a long-term power outage will have international implications that may include, but are not limited to, travel restrictions into and out of the United States, processing of visas or other immigration documents, customs and border security, and support to United States citizens living abroad.

DOS is responsible for communication and coordination between the federal government and other nations regarding the response to a domestic crisis. Consistent with the NRF and Response FIOP, DOS coordinates with foreign governments concerning travel restrictions or issues, facilitates offers of assistance from foreign governments through the International Assistance System, and coordinates assistance to cross-border communities. DOS also maintains communication with the Electricity Information Sharing and Analysis Center (E-ISAC), the North American Electric Reliability Corporation (NERC), DOE's Office of Intelligence and Counterintelligence and Office of International Affairs, and the National Council of ISACs to share cyber and physical threats, vulnerabilities, and incidents for the electricity subsector which involve international dimensions or elements.

Agencies other than DOS do have authorities pertaining to international partners. For example, DOE, FERC, NERC, and North America's Electric Reliability Organization (ERO) have authorities and responsibilities outside of the United States involving energy infrastructure and resources with Canada and Mexico. When there is a domestic crisis resulting in international energy-related impacts, these entities coordinate and consult with DOS to ensure consistent messaging.

Operational Coordination

Several support and operational coordination elements facilitate operational coordination and information sharing during a power outage incident. Depending on the cause of the outage, this construct is scalable and flexible. As a result, scenario-specific coordinating structures may be used in addition to the entities listed below. For example, if the outage is a result of a significant cyber incident, the federal government organizes coordinating structures three ways: national policy-level coordination through a cyber response group, operational coordination through the DHS CISA Operations Center and Federal Cyber Centers, and sector coordination through the DHS CISA Infrastructure Security Division (ISD) and SRMAs. In these situations, additional coordination structures are integrated into a unified coordination construct as necessary.

Unified Coordination

A long-term power outage may involve many states or FEMA regions and require coordination and prioritization of national-level resources. This annex applies the concept of unified coordination at the NRCC and among federal departments and agencies to coordinate federal support to multiple Unified Coordination Groups (UCGs) at Joint Field Offices (JFOs) established for this incident. The unified coordination approach helps various levels of government and the private sector supporting the incident to work together to establish a common set of priorities, objectives, and strategies, and ensure the coordination and allocation of scarce resources. It also enables effective coordination across restoration activities led by DOE and incident response activities led by FEMA, as depicted in Figure 1.

A significant power outage will affect all CI sectors, requiring public-private partnerships with their respective owners and operators to prioritize and enable the restoration process, manage cascading impacts, and mitigate future risks. The appropriate ESF and RSF shall facilitate coordination with each sector, often through the relevant SRMA, and using existing public-private partnerships to the greatest extent possible.

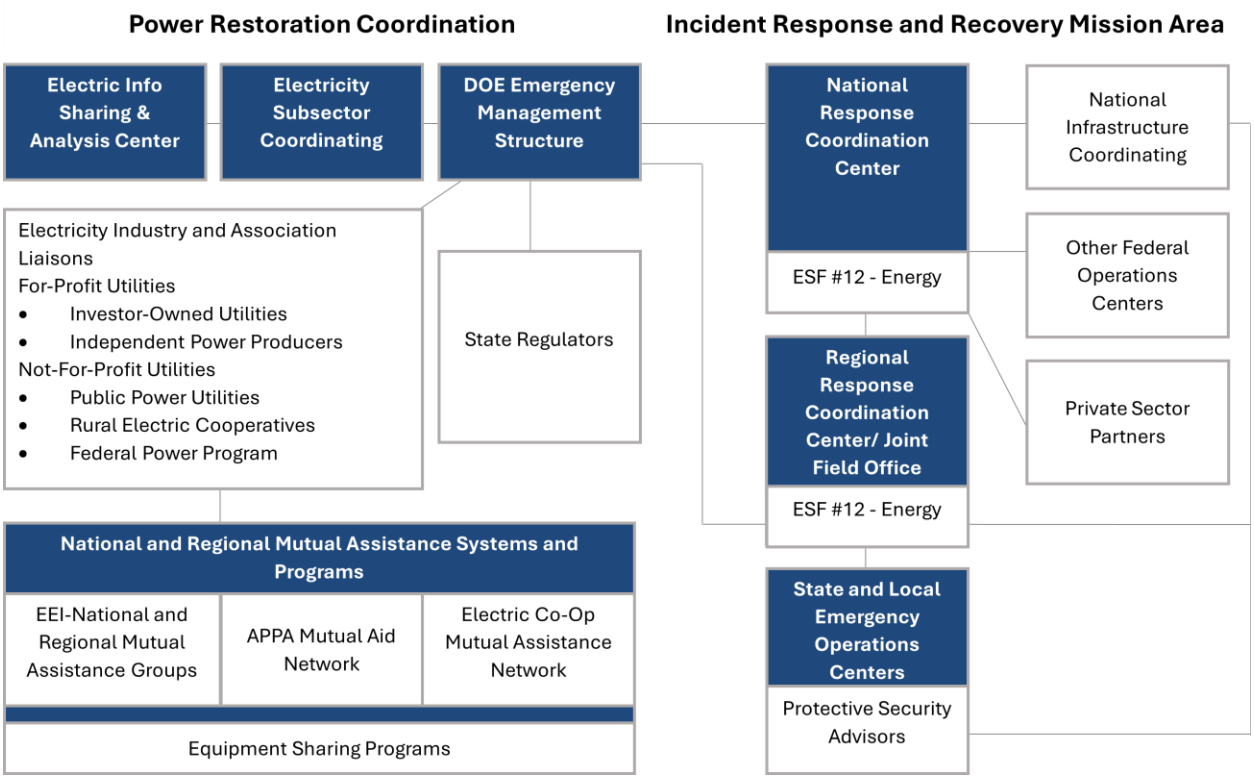

Figure 1: Unified Coordination Between Power Restoration and Incident Response and Recovery Mission Area

Power Restoration Coordination

Federal Power Restoration Coordination

DOE uses established processes and structures unique to the energy sector as the lead for restoration. Restoration is the primary responsibility of the utility industry. However, coordination between the restoration and incident response and recovery components is critical for success. For information on the restoration process, refer to DOE's United States Electricity Industry Primer.

Department of Energy Emergency Management Structure – Similar to the UCG concept in the NRF, DOE uses a department-wide coordination structure to address major, energy incidents across all its programs and stakeholders. The DOE emergency management structure directs operational activities across the department to ensure DOE uses existing resources, expertise, authorities, and directives. Should a resource or restoration prioritization issue need to be resolved, the Secretary of Energy will make that decision in close coordination with the NRCC and in consultation with the electricity industry. The DOE emergency management structure also provides situational awareness to energy sector owner/operators, SLTT governments, DOE leadership, other federal interagency partners, and the White House.

Energy Incident Management Council – The Secretary of Energy directs the establishment of the Energy Incident Management Council to increase cooperation and coordination across the department to prepare for, mitigate, respond to, and recover from major disruptions to energy systems (including infrastructure, supply, and services). The council uses the

authorities and expertise from across the department to anticipate impacted and future requirements, provide a rapid, integrated DOE assessment of an incident, adjudicate conflicting views or information, enable an effective response by the sector, develop mitigation options for decision-makers, and provide a unified, comprehensive voice and set of actions for the department. The DOE Internal Unified Coordination Structure is displayed in Figure 2.

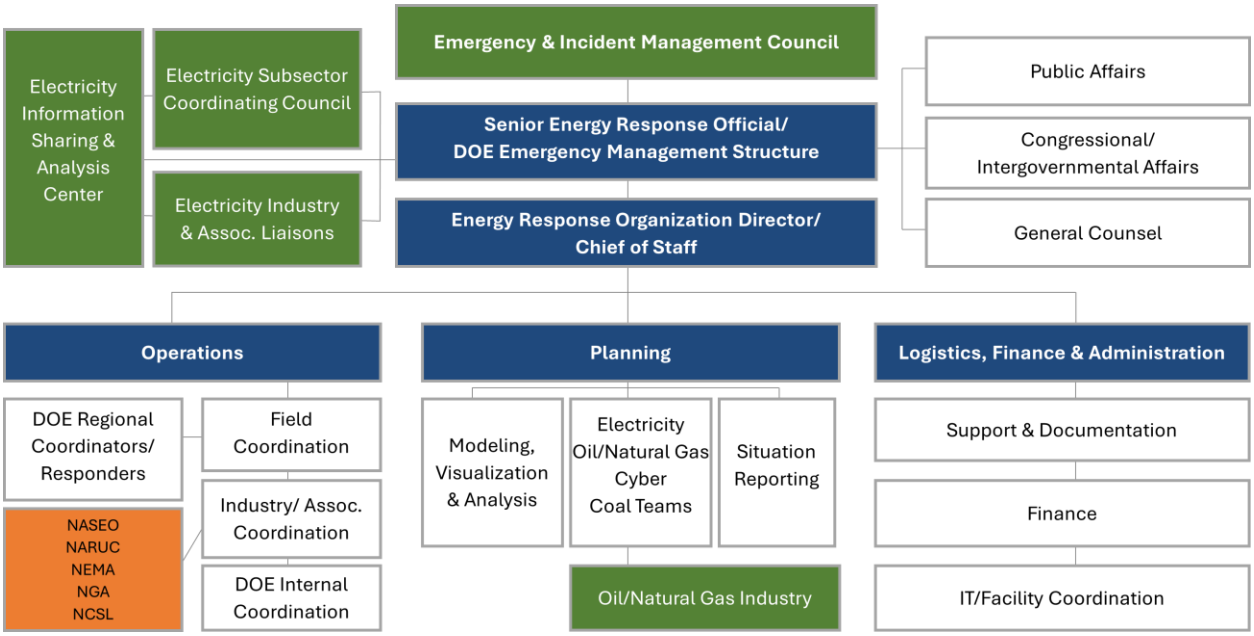

Figure 2: DOE Internal Unified Coordination Structure

The council will serve as the primary DOE coordination mechanism for senior department leadership during an energy emergency. Energy emergencies include any potential or actual disruption to energy infrastructure by a natural disaster, an industrial accident, a threat actor (cyber or physical), or an energy crisis or shortage.

National-Level Industry Power Restoration Coordination

Electricity Subsector Coordinating Council

The Electricity Subsector Coordinating Council (ESCC) facilitates and supports the coordination of subsector-wide, policy-related activities and initiatives to improve the reliability and resilience of the electricity subsector, including physical and cybersecurity infrastructure and emergency preparedness. It serves as the principal liaison with the Government Coordinating Council (GCC) for energy and its member federal agencies (including DOE as the SRMA for the energy sector) and federal utilities on issues pertaining to joint planning, preparedness, resilience, and recovery related to incidents that may affect the secure and resilient supply and delivery of electricity. The ESCC's role during its "crisis state" is to provide the mechanism for executive coordination and communication between the electric power industry and government during the response to and recovery from an

event of regional or national significance.[11]

The ESCC Secretariat communicates with ESCC leadership, the ESCC Steering Committee, and the E-ISAC, as well as with government liaisons, to request activation of a federal government-industry coordination group.

Electricity Information Sharing and Analysis Center

The E-ISAC, operated by the NERC, establishes situational awareness, incident management, coordination, and communication capabilities within the electricity sector through timely, reliable, and secure information exchange. The E-ISAC, in collaboration with the DOE and the ESCC, serves as the primary security communications channel for the electricity sector and enhances the sector's ability to prepare for and respond to cyber and physical threats, vulnerabilities, and incidents. The E-ISAC coordinates with the Electric Subsector Coordinating Council made up of industry trade associations such as EEI, APPA, and NRECA, as well as other industry groups.

During a long-term power outage, the E-ISAC:

- Closely aligns with the ESCC to keep it informed and help implement sector response and coordination intent with unity of effort and message.
- Provides representatives to the NRCC and UCG.
- Receives incident data from private and public entities.
- Coordinates with member companies.
- Identifies, prioritizes, and coordinates the protection of critical power services, infrastructure service, and key resources.
- Assists DOE, the FERC, and DHS in analyzing event data to determine threats, vulnerabilities, trends, and impacts for the sector, as well as interdependencies with other CI entities.
- Analyzes incident data and prepares reports based on subject matter expertise in security and the BPS and grid system.
- Shares threat alerts, warnings, advisories, notices, and vulnerability assessments with the industry subject to prior notification to FERC, as appropriate.
- Coordinates with other ISACs, SLTTs, federal, and international partners on incident-specific issues.
- Develops and maintains an awareness of private and governmental infrastructure interdependencies.

[11] The ESCC defines a crisis state when an incident possesses the following three characteristics. (1) National engagement by the industry and federal government is needed to respond to (2) an event of regional or national significance that (3) exceeds established private or public subsector capabilities (e.g., resources, communication, coordination).

- Provides an electronic, secure capability for E-ISAC participants to exchange and share information.
- Provide technical sector coordination support aligned to ESCC intent.

Energy Emergency Assurance Coordinators

Established in 1996, the Energy Emergency Assurance Coordinators (EEAC) Program is a cooperative effort among DOE, the National Association of State Energy Officials, the National Association of Regulatory Utility Commissioners, the National Emergency Management Association, and the National Governors Association. The program facilitates coordination and communication between states, industry, and DOE and provides states and local communities access to information on energy supply, demand, pricing, and infrastructure (e.g., petroleum, electricity, natural gas, and heating oil). Administered by DOE, the EEAC establishes a secure communications environment that consists of a restricted access website, database, and distribution list for state government personnel. During a power disruption, the EEAC provides points of contact to share energy-related information. In addition, states can also use the EEAC regional distribution list to send information to their counterparts within the region (or different regions) to exchange information and share best practices, as well as request information.

Regional/Local-Level Industry Power Restoration Coordination

As noted in the Private and Public-Sector Utility Assistance section, public and private utility associations have established regional mutual aid groups and compacts. The regional footprint of each of these groups is unique based on their stakeholders. Appendix 4: Roles and Responsibilities provides more information on these associations. As the energy sector SRMA, DOE communicates with individual utilities and associations through various mechanisms and provides utility assessments and the status of their activities and resources to the Regional Response Coordination Center (RRCC), NRCC, and CISA Operations, as appropriate, and through DOE Situation Reports.

Headquarters-Level Operational Coordination

The responsibilities of various government agencies under the NRF are an important element of intra-governmental cooperation during an energy emergency or other significant event. The coordination of federal incident response and recovery support to SLTTs is led by FEMA during Stafford Act incidents.

Interagency Response and Recovery Coordination

This section describes the coordinating structures that the federal government uses to provide response and recovery support to SLTTs to deal with the consequences of a long-term power outage.

National Response Coordination Center

The NRCC at FEMA Headquarters serves as the national incident response and recovery coordination center, collecting and reviewing all source information across all threats and all hazards information during a long-term power outage. The National Response Coordination Staff (NRCS) is the headquarters-level entity through which federal response and recovery

support is initiated and through which national-level response and recovery resource decisions are made. Figure 3 portrays the coordination within the NRCC.

- **Emergency Support Functions/Recovery Support Functions** – The federal government organizes response resources capabilities under the ESF construct denoted in the NRF and Response and Recovery FIOP. The ESFs are the primary, but not exclusive, federal coordinating structures for building, sustaining, and delivering response core capabilities.

Consistent with the NDRF and the Response and Recovery FIOP, the federal government uses RSFs to coordinate key functional areas of recovery support. The synchronization of federal response and recovery support operations and facilitation of restoration efforts with the private sector is facilitated through each of the 16 CI sectors in coordination with the relevant ESF or RSF, as required.

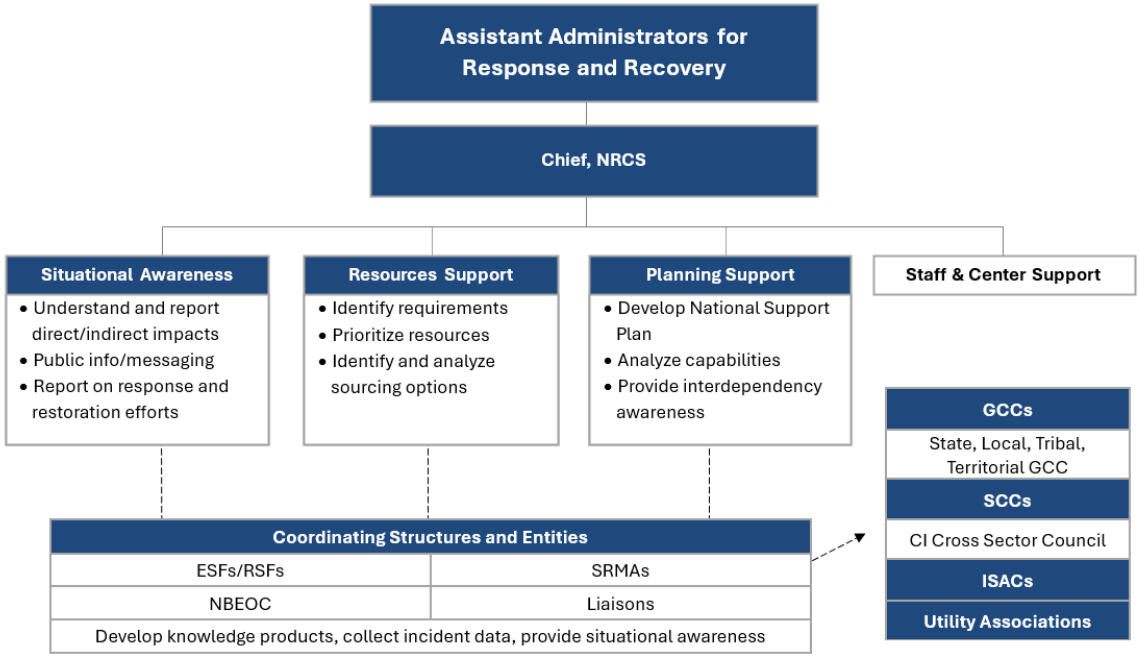

Figure 3: Coordination Within the NRCC for Cascading Impacts from a Long-Term Power Outage

- **Future Planning Cell** – The FEMA Administrator may establish a planning cell within the NRCS Planning Support Section to forecast incident support functions needed to handle cascading impacts to survivors resulting from the outage. Planning cells serve as a decision support entity to senior policy makers or to NRCC leadership by developing future courses of action or recommendations on strategic emergency management issues. The cell is ideally composed of subject matter experts (SMEs) representing key core capabilities and agencies who can advise and develop recommendations on federal response and recovery efforts based on the regional and national impacts from the long-term power outage on health, safety, and security. Given the resource demands on many entities during a large-scale incident, if SMEs themselves are not available, staff with the ability to contact appropriate SMEs within their organizations may be asked to participate. The cell does not have an operational

role during power outage response/recovery operations and will not be in direct contact with on-the-ground personnel in the incident command. It also does not direct or provide guidance for energy restoration efforts. The cell augments ESF and RSF capabilities by providing an integration and decision-support function for leadership to help synchronize federal response and recovery operations to support sector restoration efforts and lifesaving and life-sustaining actions.

The planning cell's membership will vary depending upon the location, scope, and complexity of the event and may occur virtually. The members may include representatives from the following entities:

- Department of Commerce (DOC)
- DOD
- National Guard
- DOE
- DHS
  - FEMA
  - CISA
- Department of the Interior (DOI)
- Department of Labor (DOL)
- DOS
- Department of Transportation (DOT)
- Department of Health and Human Services (HHS)
- Environmental Protection Agency (EPA)
- FERC
- General Services Administration (GSA)
- Nuclear Regulatory Commission (NRC)
- USDA

Based on the specificities of the incident, requests for agency representatives will be based on the expertise required and will be appropriately communicated to the agencies (e.g., full time or part time, subject matter areas, desired level of expertise or seniority). National-level electric industry association representatives (e.g., APPA, EEI, ESCC, and NRECA) or representatives from PMAs may be asked to participate in the cell on an ad hoc basis depending on their availability and upon the Secretary of Energy's determination that their assistance is required.

Critical Infrastructure Planning Cell

The NRCC is the mechanism through which federal response and recovery activities are coordinated. Among the mechanisms are dedicated planning cells that may or may not stand up based on the complexity and scope of the power outage.

The NRCC may choose to stand up a critical infrastructure planning cell. The critical infrastructure planning cell would serve as a decision support entity to senior policy makers or to the leadership of the NRCC by developing future courses of action or recommendations to mitigate the ongoing cascading effects of the incident to other CI sectors. The critical infrastructure planning cell may include representatives from each of the SRMAs as well as other SMEs.

National Business Emergency Operations Center – Within the NRCC, the National Business Emergency Operations Center (NBEOC) coordinates with national companies and private sector organizations to obtain situational awareness of the impacts of a long-term power outage on these businesses. Consisting of over 500 private sector companies of national scale, the NBEOC serves as the central clearinghouse of situational awareness for the private sector at large and complements the efforts of CISA Operations and SRMAs.

Additionally, the NBEOC coordinates with state BEOCs and other operational private sector coordinating functions at the state or regional levels. The NBEOC conducts scheduled conference calls during a long-term power outage and invites state public utility commissions, appropriate ESFs/RSFs, FEMA regions, CISA Operations, DOE, and CISA liaisons to the NRCC. During these calls, the private sector obtains an understanding of the response and recovery priorities and needs of survivors, as well as provides the government with an understanding of the private sector's impacts, needs, and available capabilities and resources to support business continuity. This ensures that the federal government is aware of the cascading impacts on businesses and works collaboratively with the private sector at large.

CISA Operations

CISA Operations is the simplest way for critical infrastructure partners and stakeholders to engage with CISA, request assistance, and get the information they need to understand the constantly evolving risk landscape.

CISA works closely with public sector, private sector, and international partners, offering technical assistance, information security, and education to protect our nation's critical infrastructure from a broad range of threats. Through CISA Central, CISA coordinates situational awareness and response to current cyber, communications, and physical incidents.

CI Sector Coordination

Coordination across the CI sectors and with ESFs and RSFs provides a mechanism to:

- Understand cascading impacts of a long-term outage.
- Identify opportunities for federal response and recovery operations to enable restoration of CI.
- Synchronize operational priorities and targets.

Table 2: CI Sector Coordination Relationships

CI Sector	SRMA Coordinating Entity	SCC[12]	GCC[13]	ISAC	ESFs	RSFs
Chemical	CISA	X	X	Chemical ISAC	None	Infrastructure Systems
Commercial Facilities	CISA	X	X	Real Estate ISAC	#5, #7	Infrastructure Systems

[12] Critical Infrastructure Cross Sector Council

[13] State, Local, Tribal Nations and Territorial Government Coordination Council & Federal Senior Leadership Council

CI Sector	SRMA Coordinating Entity	SCC[12]	GCC[13]	ISAC	ESFs	RSFs
Communications	CISA/ESF-2	X	X	Communications ISAC	#2	Infrastructure Systems
Critical Manufacturing	CISA	X	X	None	None	Infrastructure Systems
Dams	CISA	X	X	None	#3	Infrastructure Systems
Defense Industrial Base	DOD	X	X	Defense Industrial Base (DIB) Collaborative Information Sharing Environment (DCISE)	None	Infrastructure Systems
Emergency Services	CISA	X	X	Emergency Management and Response ISAC	#3, #4, #5, #13	Infrastructure Systems
Energy	DOE Office of Electricity Delivery and Energy Reliability/ Infrastructure Security and Energy Restoration	X	X	Electricity Sector ISAC, Oil and Natural Gas ISAC, Downstream Natural Gas ISAC, NERC	#3, #12	Infrastructure Systems
Financial Services	Department of the Treasury (TREAS) Office of Critical Infrastructure Protection and Compliance Policy		X	Financial Services ISAC	None	Infrastructure Systems
Food and Agriculture	USDA Office of Homeland Security and Emergency Coordination; Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Analytics and Outreach	X	X	None	#8, #11	Infrastructure Systems
Government Facilities	GSA Office of Mission Assurance, Security and Special Programs Division/DHS Federal Protective Service		X	None	#7	Infrastructure Systems

CI Sector	SRMA Coordinating Entity	SCC[12]	GCC[13]	ISAC	ESFs	RSFs
Healthcare and Public Health	DHS Office of the Assistant Secretary for Preparedness and Response (ASPR)	X		National Healthcare ISAC and Healthcare Ready	#6, #8	Infrastructure Systems/ Health and Social Services
Information Technology	CISA		X	Information Technology ISAC	None	Infrastructure Systems
Nuclear Reactors, Materials, and Waste	CISA	X		None	#12	
Transportation Systems	DHS (Transportation Security Administration [TSA] Office of Security Policy and Industry Engagement and United States Coast Guard [USCG] Office of Port and Facility Compliance); DOT Office of Intelligence, Security and Emergency Response	X		Surface Transportation ISAC, Public Transportation ISAC, Aviation ISAC, Maritime ISAC, Oil and Natural Gas ISAC	#1	
Water and Wastewater Systems	EPA Water Security Division	X		Water ISAC	#3, #8, #10	Infrastructure Systems/ Health and Social Services

Cybersecurity and Infrastructure Security Agency Incident Coordination Framework

- This framework outlines the coordination constructs that support CISA strategic intent when an incident or event requires operational actions by the agency. The primary focus of the CISA Incident Coordination Framework is to define agency structures and resources that can be activated during an incident or event. The CISA Incident Coordination Framework, for which Integrated Operations Division (IOD) serves as the steward, identifies the tiered incident coordination structures, responsibilities, and procedures implemented during CISA incident coordination operations. The framework also provides guidance for the planning, training, and execution by CISA Divisions and Mission Enabling Offices (MEOs). The CISA Incident Coordination Framework ensures a common, shared, and modifiable approach to coordinating operations that support the unity of effort, coordination, and collaboration across all CISA organizational elements.

Other National-Level Response and Recovery Coordination

In addition, agencies may also activate their own operations centers such as the National Military Command Center, the Strategic Information and Operations Center, or the HHS

Secretary's Operations Center. Depending on the international impact, the DOS Executive Secretariat and its Operations Center may establish a DOS Task Force for a power outage if there are major international implications.

Regional-Level Operational Coordination

Responsibilities of an RRCC are consistent with the NRF, NDRF, and Response and Recovery FIOP. The RRCC coordinates assignments, actions, and other support until a JFO is established and mission-execution responsibilities are transferred to the appropriate team leaders. While the assumption is that a long-term power outage would result in a Stafford Act declaration, in a circumstance where it does not, federal incident management activities will be coordinated out of the applicable RRCC.

NERC Regional Entities

NERC, as the ERO for North America, assures the reliability of the BPS. NERC delegates its authority to monitor and enforce compliance to 8 regional entities whose members come from all segments of the electric industry: investor-owned utilities; federal power agencies; co-ops; state, municipal, and provincial utilities; independent power producers; power marketers; and end-use customers. These entities account for virtually all the electricity supplied in the United States, Canada, and Mexico. The NERC coordinates with federal agency leadership, including DOE, FERC, DHS, and others as appropriate.

See Appendix 8: Acronyms for undefined acronyms in Figure 4.

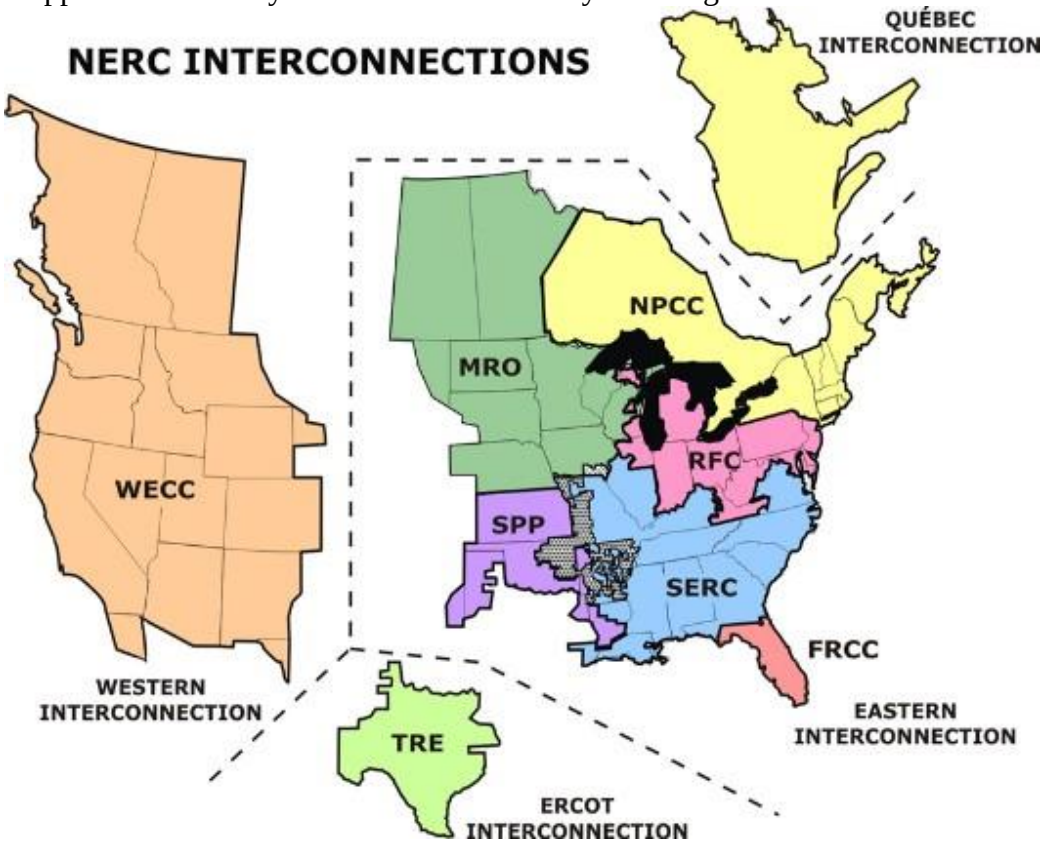

Figure 4: NERC Regions

Field-Level Operational Coordination

Joint Field Office or Regional Response Coordination Center

The UCG in a JFO/RRCC is flexible and scalable depending on the specific incident. For a power outage, representatives from affected utilities or the regional utility association may participate as members of the UCG to assist in decision-making to prioritize resources.

The JFO/RRCC coordinates with state and local emergency operations centers (EOCs), as well as with industry-specific EOCs that are supporting the response and recovery of a power outage. It incorporates appropriate ESF and RSF structures. As the federal focus shifts toward long-term recovery, a plan between the Federal Coordinating Officer and Federal Disaster Recovery Coordinator will be developed to ensure a seamless transition.

Joint Operations Center

If the cause of the power outage is an actual or suspected terrorist attack, the Attorney General, acting through the Federal Bureau of Investigation (FBI) Director, leads and coordinates the operational law enforcement response, on-scene law enforcement, and related investigative and appropriate intelligence activities related to terrorist threats and incidents. As noted in the Response FIOP, the FBI may establish an FBI Command Post or Joint Operations Center (JOC) for the purpose of managing the investigation, and leading and coordinating the law enforcement response to resolve terrorist threats or incidents. If established, the JOC coordinates with the JFO.

State/Local Emergency Operations Centers

As necessary, the state and local EOCs incorporate representatives from impacted utilities and other CI sectors to ensure that the appropriate SMEs are involved in decision-making for state support. Working with the state EOCs, representatives from state public utility commissions or other electricity/utility SMEs advise and assist in decision-making to prioritize state resources for the restoration process (e.g., public safety officers to assist with access points, fuel, and logistics).

In the case of tribal lands, tribal governments have a special relationship with the U.S. government, and local, state, and federal governments may have limited or no authority on tribal lands. The NRF's Tribal Relations Support Annex provides further guidance. Many states involve their tribal counterparts in their EOCs.

- **Protective Security Advisors** – Protective Security Advisors (PSAs) are field-deployed CISA experts who serve as liaisons in state and local EOCs and coordinate the provision of situational awareness and analytical support. During incidents, the PSAs report to the Infrastructure Liaison in the JFO.

Operational Phases

The operational phases for providing coordinated federal support to SLTT governments are identified in the Response and Recovery FIOP. While individual partners may not use the same phasing for their internal operations, for the purpose of a coordinated federal response, the following phasing applies. Response and recovery operations run concurrently and the actions will overlap to an extent.

Table 3 and Table 4 depict the relationship and overlap between the response and recovery operational phases. The actions associated with this annex are focused on Phase 2c (Sustained Response) and Phase 3a (Recovery) in the response phases and Intermediate and Long-Term phases in the recovery phases.

Table 3: Operational Response Phases

	Federal Government Response Phases—Defined
Phase 1a	Normal operations
Phase 1b	Elevated threat/enhanced steady state
Phase 1c	Credible threat assessment/alert, stage, and deploy
Phase 2a	Awareness, situational assessment, pre-declaration planning and coordination, stage and deployment of response/scoping recovery requirements
Phase 2b	Initial employment of resources and stabilization/deliver recovery support
Phase 2c	Intermediate and sustained operations
Phase 3a	Deliver recovery support
Phase 3b	Grant administration and closeout

Table 4: Operational Recovery Phases

	Federal Government Recovery Phases—Defined
Immediate/ Short-Term (Days)	Addresses the health and safety needs beyond rescue, the assessment of the scope of damages and needs, the restoration of basic infrastructure, and the mobilization of recovery organizations and resources, including restarting and/or restoring essential services (e.g., gas, water, electricity) for recovery decision-making
Intermediate (Weeks–Months)	Involves returning individuals, families, CI, and essential government or commercial services to a functional, if not pre-disaster, state; such activities are often characterized by temporary actions that provide a bridge to permanent measures
Long-Term (Months–Years)	Addresses complete redevelopment and revitalization of the impacted area; rebuilding or relocating damaged or destroyed social, economic, natural, and built environments; and a move to self-sufficiency, sustainability, and resilience

The concept of operations of this annex focuses on power outages with long-term impacts. While many incidents such as severe weather result in some type of short-term power outage, the actions in this annex assume that initial response and power restoration activities (e.g., activation of operations centers, deployment of response teams) to support immediate life-saving actions have occurred. The actions in this annex focus on only unique activities for a long-term power outage and those activities undertaken by those entities responsible for the energy sector.

Phase 1a – Normal Operations

The federal government coordinates with all stakeholders to develop and validate plans to deal with long-term power outages and continues situational awareness monitoring. Refer to the Response and Recovery FIOP for a list of all-hazards preparedness actions for the federal government in this phase.

DOE, as the SRMA and lead federal agency for the energy sector, coordinates the following preparedness actions within the energy sector:

- Coordinates with the public/private energy sector, the Electricity and the Oil and Natural Gas SCCs, the ERO, and various associations that represent portions of the energy sector, as well as with SLTT and federal entities.
- Assists the states in preparing state energy assurance plans to improve the reliability and resiliency of the nation's energy systems, and maintains the EEAC Program, contact list, and database.
- Conducts national security emergency preparedness planning, including capabilities development, administering operational programs for all energy resources, and conducting energy emergency exercises with the energy industry, federal partners, and SLTT governments.
- Develops, tests, trains, and exercises continuity programs and plans coordinating with whole community partners and stakeholders.

DOE coordinates the following activities with SLTT governments:

- Conducts preparedness activities that support response and recovery to power outages, such as exercises, training, and plan development, consistent with their emergency operations and continuity plans.
- Involves local disability stakeholders in emergency planning to accurately and adequately incorporate considerations of people with disabilities during a long-term power outage.
- Develops inclusive engagement strategies with the public and private utility companies in their state or jurisdiction.[14]
- Ensures local and state emergency operations plans include fuel action plans that identify priority users, staging areas, and daily fuel consumption by type of critical facility.

In preparation for power outages, utilities participate in preparedness activities such as:

- Contingency and continuity planning and exercises for restoration.
- Educating state EOC personnel on energy restoration and importance of right-of-way programs.
- Validating contact information for SLTT partners.
- Hardening of infrastructure, inspections, and assessments.
- Ensuring that they have standing contracts with diesel fuel suppliers.

[14] Jurisdictions with emergency operations plans that are inclusive of people with disabilities and others with access and functional needs are better prepared to meet or quickly identify and mitigate mass care needs of all whole community members.

- Developing restoration priorities.
- Developing smart grids and micro grids.
- Developing contracts (e.g., for fuel).
- Improving resiliency.
- Developing mutual assistance agreements.

Phase 1b and 1c – Elevated and Credible Threats

Long-term power outages cannot always be predicted; however, certain threats such as severe weather are a common cause. Certain scenarios such as winter storms or hurricanes often cause power outages. The intelligence community may identify and communicate potential or credible threats to the electric grid. In situations with an elevated or credible threat of disruption to the energy sector, government agencies and utility owners and operators will take certain preventative actions.

The federal government:

- Analyzes and models the potential impacts to the electric power, oil, natural gas, and coal infrastructures; analyzes the market impacts to the economy; and determines the disruption's effect on other CI sectors.
- Through DOE, conducts coordination calls and initiates situational reporting with electric industry representatives, regions, and states.
- Through CISA Operations and E-ISAC, provides threat information and alert products.

SLTT governments:

- Coordinate with their public utility commissions.
- Identify potential waivers that may be required to expedite disaster response.
- Review local and state plans for energy restoration and prioritization.

Utility owners and operators also take preventative actions depending on the credibility and likelihood of a threat to the electric grid. They:

- Appoint coordinators or leads for various functions (e.g., live wires down, restoration, vegetation management, communications) if not already identified as part of their emergency plans.
- Review and reassess their critical asset list and rank assets for restoration priority.
- Initiate communications with SLTT, federal officials and members of mutual assistance groups.
- Share information with industry and government through ISACs.

- Identify and position resources to respond to an outage and implement a plan to prioritize response actions (i.e., those that have immediate threat to life or property loss such as downed live wires, and restoration of emergency and hospital services).
- As needed, communicate with their customers on preventative measures and expectations of consequences.
- Commence industry-government coordination through the ESCC and aligned E-ISAC support.
- Alert regional mutual assistance programs.

Phase 2a and 2b – Immediate Response and Deployment

Immediate response includes actions taken within 72 hours of a notice or no-notice incident resulting in a power outage. Actions focus on saving lives; protecting properties and the environment; rapidly meeting basic human needs; preserving the social, economic, and political structure of the jurisdiction; and supporting the transition to recovery.

During this phase, the federal government and utilities undertake certain actions such as activating and deploying specialized teams and assets (if not already done in Phase 1), conducting damage assessments, and sharing information on outages.

Specific federal actions are detailed in the ESF and RSF annexes, as well as in the Response and Recovery FIOP. The following section focuses on power-specific activities of the electric industry.

SLTT governments:

- Through the public utility commissions or other appropriate state agencies, require the reporting of outages and other events that disrupt power systems.
- Activate the State Energy Operation Center if one exists.
- Conduct damage assessments.
- If required, develop governor directives authorizing counties to use available in-state fuel supplies to perform initial life safety missions.
- Coordinate with the federal government for waivers necessary to expedite lifesaving or life-sustaining missions.
- Coordinate delivery of in-state bulk fuel supplies into impacted areas.
- Review pre-designated state staging areas and fuel PODs.
- Develop prioritized lists of CI for temporary emergency power.

During these sub-phases, public and private electric companies:

- Initiate actions consistent with company emergency plans and the ESCC Playbook

and in coordination with the E-ISAC to provide support, information, and advice to the federal government and sector stakeholders on incident response.

- Coordinate mutual aid through their regional energy-specific associations and inform federal agencies and other organizations of mutual aid status; if warranted, they activate their national-level frameworks.
- Request assistance from local or state governments, health and human services, including disability, stakeholders who can provide immediate real-time information and situational awareness about people with disabilities and others with access and functional needs who may depend on power for life maintenance and/or to mitigate personal health and safety issues (such as those living independently and or group or some facility settings).
- Maintain open communication channels with customers to inform them of safety measures, impact assessments, and restoration estimates.
- Prioritize plans and actions to restore energy during response and recovery operations.
- Assess, isolate, and restore undamaged areas of the BPS.
- Assess the state of the power grid to determine restoration priorities and strategies.
- Employ "black start" generators to restore generating stations if power is unavailable from the transmission network.
- Synchronize re-energized sections of the BPS.

Many of the actions performed by electric companies will continue through various phases until restoration is complete.

Restoration Priorities

Typically, utilities adhere to the following repair and restoration sequencing:

- Power Plants
- Startup Power
- Large Transmission Lines/Sub-Stations
- Distribution Sub-Stations and Feeder Lines
- Restoration to CI Facilities
- Residential Areas.

Phase 2c – Sustained Response

Phase 2c of the power outage covers a period of 2 weeks to 30 days following the incident, when response operations will transition from Initial Operating Facilities to JFOs (if not already established). In addition to the actions identified in the Response and Recovery FIOP, the federal government:

- Coordinates with utilities and CI sectors and identifies cascading impacts from the outage.
- Supports interdependencies with other sectors and identifies actions needed to enable the restoration process in other sectors.
- Communicates critical information to the public, including estimated time of restoration as provided by industry.
- Identifies and communicates opportunities to mitigate or safeguard against risks.

SLTT governments:

- Confirm that pre-designated state staging areas and fuel PODs align with state lifeline routes.
- Ensure that pre-designated fuel points align with local priority routes with adequate storage and dispensing capabilities.

Public and private electric companies:

- Assess and isolate damaged areas of the bulk power grid and determine remediation plans.
- Activate their mutual aid networks through their respective electricity associations (if not done so in earlier phases).
- Monitor requests for mutual aid and responses through their respective mutual assistance programs.
- If warranted, activate transmission equipment sharing programs (e.g., STEP, SpareConnect) to help restore the BPS.
- Continue to execute emergency operating procedures such as:
    - Cancelling or recalling prior-scheduled transmission and generation outages.
    - Managing the generating resources to address fuel supply and inventory concerns.
    - Requesting waivers or other regulatory relief from environmental requirements as appropriate.
    - Using curtailable load and demand response.
    - Loading management procedures including rotating blackouts, as needed.

An increasing number of short-term and intermediate recovery and mitigation activities will occur during this sub-phase.

Phase 3 – Recovery

Recovery planning and coordination for all phases of recovery (short-term, intermediate, and long-term) begin with the event and response. Short-term recovery actions occur within the response mission space (Phase 3a) to address health and safety needs beyond rescue, assess the scope of damages and needs, restore basic infrastructure, and fully mobilize recovery organizations and resources. Intermediate and long-term recovery activities can extend much longer when there is a continued need for federal assistance by impacted states.

Each community, state, Tribal Nation, or territory defines successful recovery outcomes differently based on its circumstances, challenges, recovery vision, and priorities. In general, the goal of recovery following a long-term power outage includes ensuring the return of individuals and families and to reestablish essential government and/or commercial services to support the physical, emotional, and financial well-being of impacted community members. Recovery activities also include incorporating health and social services and strengthening key systems and resource assets that are critical to the economic stability, vitality, and long-term sustainability of the communities themselves.

Critical Information Requirements

Critical information requirements (CIRs) facilitate timely command, control, and coordination of decisions during disaster operations. They provide insight into important details and essential elements of information that response personnel need to effectively make decisions and execute their operations.

CIRs may vary based on the specifics of the power outage. The UCG will define what information is required, and the CIRs are incorporated into the JFO's Information Collection Plan. The following CIRs are supplemental to those outlined in the Response and Recovery FIOP and are linked to key decisions where appropriate.

Incident Characterization

- The most critical information element *is the estimated duration of outage*.
    - Less than 7 days does not trigger the unique considerations of a long-term power outage.
    - > 7 but < 14 is location dependent – urban population sustainment degrades faster than rural.
    - > 30 triggers full consequence management activities including relocation.
- Demographic information of the affected population, including vulnerable positions on utility registries that may need assistance.
- Population density maps with overlay of power outage areas.

Utility and Restoration Information (Coordinated through DOE)

- Power outage statistics organized by state, county, or parish.
- Customers impacted/without power.

- Damage assessment and estimates of duration of power outages, and status of restoration.
- State of utility systems, current limitations and capabilities, resource requirements, and recovery strategy.
- Status of all types of fuel, status of generation, substation, line facilities.
- Limiting factors/barriers (e.g., transportation, housing) for utility restoration efforts.

Resource Availability

- Availability of backup power and restoration assets within the impacted area that will affect response and recovery options.
- Fuel status for public consumption.
- Fuel status for public safety and security services.
- Generator/fuel status for critical assets across each of the 16 CI sectors and any additional interagency needs to support essential functions and services.

Sheltering, Feeding, and Distribution of Emergency Supplies

- Status of evacuations and locations of evacuees or shelters.
- Location of actual or potential impacts to CI sectors other than the energy sector.
- Name and status of healthcare facilities (including nursing homes, dialysis facilities) in the impacted area for restoration prioritization.
- Forecasted and cascading impacts to CI, which may affect mobility within the area for an extended period (e.g., bridges, roads, major highways, railways, and airports).
- Water treatment plant operational status.
- Wastewater treatment plant operational status.

State and Local Plans/Agreements

- State-identified priorities for restoration.

Essential Elements of Information

Essential elements of information support the CIRs by providing more detail for situational awareness and decision-making. Essential elements of information must be verified and include specific details. Examples of potential essential elements include but are not limited to the following items.

Essential Elements of Information for Government

- Maps/information on CI specific to the incident area.
- Identification of frequency and command structure for operational communications.
- Name of power utilities impacted.
- Updates on restoration progress.
- Critical needs of materials, transportation, and physical access restrictions per sector.
- Status of state and local response and recovery resources.
- Number of potential evacuees, and locations of host communities with concentrations of evacuees, whether in state or out of state.
- Location and status of critical healthcare facilities and services (hospitals, nursing homes, dialysis) and information on at-risk populations with access and functional needs and their medical and social service needs.
- Long-term evacuee/displaced person status tracking data (e.g., employment, temporary housing, preferences for permanent relocation versus return, if applicable).
- Location and accessibility of open or planned shelters, fixed and mobile feeding sites, and sites for distribution of emergency supplies (e.g., PODs).
- Limiting factors or obstacles for each sector's restoration of functions (sequencing of activities).
- Requirements for federal assistance (if any) to enable sector continuity or restoration efforts.
- Status of sector mutual assistance, major restoration efforts underway, and estimated times for restoration.
- Private association/nonprofit association requests for assistance.
- Contaminated waste management and potential sites for temporary debris/waste storage.
- Host community agreements to support displaced populations.

Essential Elements of Information for the Electricity Subsector

- Situational awareness:
    - Reports provided through DOE.
    - Information and intelligence on incident characterization.

  - Status on emergency declarations.
  - Command structure.

- Prioritization for restoration and resource allocation:

  - List of critical facilities to use in prioritizing restoration.
  - Priorities for SLTT or federal government.
  - Identification of critical needs to aid in prioritizing restoration efforts (e.g., water, emergency services, hospitals, shelters).
  - Deployment and location status of federal assets.
  - Lists of designated staging sites.
  - Status of generator packs in relation to affected utilities and estimates on arrival times.
  - Status and availability of airport, seaport, and other transportation infrastructure and access route status.
  - Status of U.S. border crossing processes with Canada and Mexico to ensure expedited crossing to support restoration.

- Coordination and communication with government (through DOE):

  - Communication of waivers to utilities, including the status and a central point of contact for information on waivers.
  - List(s) of applicable key decisions involving utility resources and/or assets.
  - Information on security concerns, access-controlled area(s), and credentialing requirements.

- Accessible public information:

  - Federal support and assistance programs to which members of the public can be directed.
  - Support and assistance from FEMA and other federal agencies made available to assist affected subsector employees.

Oversight, Coordinating Instructions, and Communications

Oversight

FEMA, in close coordination with the DOE, is the executive agent for this annex and is responsible for its management and maintenance. FEMA will update this annex periodically, as required, to incorporate new presidential directives, legislative changes, and procedural changes based on lessons learned from exercises and actual incidents.

Coordinating Instructions

To facilitate rapid, coordinated, and seamless integration of federal and federally accessible resources into a localized response effort, SLTT governments are encouraged to incorporate the concepts of this annex into their respective plans to support the delivery of federal assistance. Successful incident management operations depend on the involvement of

multiple jurisdictions as well as personnel and equipment from federal agencies. Federal agencies should assume that jurisdictional capabilities will be insufficient or have been exceeded as soon as they recognize that multiple jurisdictions/regions have lost power.

Logistics Architecture

A long-term power-constrained environment will require significant logistical support from the whole community to support mass care and emergency assistance services, enable the power restoration process, support evacuation if necessary, and promote continuity of critical missions. An interagency supply chain system known as the National Logistics System coordinates federal logistical support consistent with the logistics concept of support in the Response FIOP.[15] Under this system, FEMA and other federal interagency partners operate under their statutory authorities, in coordination with the whole community, to stage personnel and resources in locations favorable to providing timely and efficient access to the impacted area(s). Within the NRCC, federal logistical resource requirements are reviewed and prioritized based on the specifics of the power outage and the approved course of action.

In a long-term power outage, federal temporary emergency power generation assets (e.g., generators and fuel) to maintain mission essential functions and provide lifesaving and life-sustaining support will be in high demand. Federal temporary power generation equipment and technical support may be provided by FEMA, USACE, the Defense Logistics Agency (DLA), or GSA. Prioritization for generators and fuel will be particularly important since the federal government has limited organic generator capability. As a result, the logistics architecture will be adapted as necessary (e.g., tailoring unique delivery and dispensing plans of commodities to address the unique circumstances for an incident).

Private Sector Coordination

- CISA Office of Infrastructure Protection (IP), including through the National Infrastructure Coordinating Center (NICC), coordinates with private sector partners directly (for sectors which IP serves as SRMA) and with cross sector partners (as the national coordinator of CI protection) to accomplish the following:
    - Coordinate with NBEOC to vet CI private sector Requests for Information (RFIs).
    - Support requirements to ensure rapid stabilization and access to impacted private sector CI.
    - Collect, share, and disseminate status updates on CI operations, impact, consequences, and analysis and recommendations for restoring CI in coordination with the relevant SRMAs.
- DHS National Cybersecurity and Communications Integration Center (NCCIC), through the National Coordinating Center (NCC) joint government and communications industry partnership, serves as the Communications Information and Sharing Analysis Center to:
    - Coordinate with wireline, cellular, wireless, broadcast, satellite, and cable, operators; equipment manufacturers; and communications associations.

[15] For more information on the National Logistics System, refer to *NRF ESF #7 Logistics Support Annex* or the *Federal Emergency Management Agency (FEMA) Logistics Operations Manual* (FEMA publication 9380.1-PR, August 2010).

  - Provide situational awareness of communications services.
  - Provide communications analytic products of impacts to support planning, response prioritization, and decision-making.

- DOE:

  - Coordinates with electricity owner/operators, suppliers, regulatory entities, and industry associations, and conducts regularly scheduled conference calls with impacted utilities and their associations as incidents require.
  - Coordinates with owners, operators and members of trade associations representing the oil and natural gas subsector as necessary and appropriate.

- FERC coordinates with NERC and the E-ISAC regarding cyber and physical alerts to be issued to regulated entities.

- The National Council of ISACs conducts calls with cross-sector stakeholders during a long-term power outage to share information and obtain status updates on emerging issues from various CI sectors.

- The NBEOC, an element within the NRCC, connects private sector stakeholders to resources or information at the local, state, regional, or federal levels for specific issues or capabilities pertaining to a long-term power outage.

- CISA Liaison:

  - Serves as the primary conduit between FEMA and CISA to assist the NRCC in future planning and to provide situational awareness as it relates to CI risk analyses.
  - Provides the NRCC with access to analytical products such as infrastructure impact assessments. The Infrastructure of Concern (IOC) List and infrastructure assessments are decision support tools that are available to NRCC leadership to inform resource allocation and prioritization.

Non-Government Organizations

- Provide critical situational awareness and field data on survivor needs to the NRCC, DOE, and infrastructure and other teams to support power restoration, evacuation, and other planning efforts.

- Through Voluntary Agency Liaisons, share information on requirements and capabilities of voluntary, faith-, and community-based organizations with the federal government.

- Assess needs generated by the incident and support the state's coordination of the provision of timely and efficient services.

- Coordinate with state agencies to determine the need for any federal resource requests for needed mass care/emergency assistance items and help facilitate their deployment and arrival.

- Determine federal support for state and local response and recovery efforts, to include referrals for housing, unmet needs, case management, and referral services.

Communications

Immediate action should be taken to identify communication systems for public messaging to provide clear, factual, accessible, linguistically appropriate, and timely guidance to the public (see Appendix 3: Communications).

Communication systems for local, state, and federal agencies should coordinate to maintain situational awareness and permit timely assessments of the status of critical services, resources, and infrastructure. The primary reporting method for interagency information flow is the Homeland Security Information Network (HSIN) and WebEOC™. If WebEOC is inaccessible due to the power outage, backup communications and information sharing protocols will be identified on a case-by-case basis. In addition to WebEOC, federal recovery partners use the Office of Management and Budget's MAX program for a broad scope of daily information sharing and collaboration, both pre- and post-incident.[16]

[16] http://max.omb.gov

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Annex A: Electricity Delivery

Electricity Delivery

Three functions categorize the structure of electricity delivery within the United States—generation, transmission, and distribution—that are linked through key assets, including substations. Overall, the power infrastructure is highly redundant and resilient, but some components of the systems are vulnerable to natural hazards, acts of terrorism, and space weather.[17] As a result, outages can and do occur because of system disruptions.[18]

Generation

A diverse fuel mix generates the power supply in the United States, including coal, natural gas, petroleum liquids, nuclear, hydroelectric, and renewables. A power plant can have one or more generators, and some generators can operate using multiple types of fuel. Generation capacity varies regionally and depends on the availability of the fuel resource. For example, coal and natural gas power plants are more common in the Midwest and Southeast, whereas the West Coast depends upon high-capacity hydroelectric power and natural gas-fired power plants. Power generation fuels also have their own supply chain. Vast infrastructure networks of railroads, pipelines, waterways, highways, and processing plants support the delivery of resources to generating facilities, and many such networks rely on electric power.

Transmission

The combined transmission and distribution network is referred to as the "power grid" or simply "the grid." The power generation and high-voltage transmission lines that deliver power to distribution facilities make up the BPS, which comprises four lesser alternating current power grids or "interconnections." Each interconnection operates independently of one another, except for a few direct current conversion links in between. Figure 5 shows the boundaries of four of these interconnections. The two major subordinate grids, which are also the largest, are the Eastern Interconnection and the Western Interconnection. The Eastern Interconnection reaches from Central Canada eastward to the Atlantic coast (excluding Québec), south to Florida, and west to the foot of the Rockies (excluding most of Texas). The Western Interconnection stretches from Western Canada south to Baja California, Mexico, reaching eastward over the Rockies to the Great Plains. The two minor alternating current power grids are the Texas Interconnection, which covers most of the state of Texas and represents approximately 90 percent of the state's electrical load, and the Quebec Interconnection, which covers all of the Province of Quebec. The Hawaii and Alaska grid systems (not shown in the figure) are not connected to the grids of the lower 48 states.

[17] Extreme space weather, especially geomagnetic storms that can cause long-term power outages, are low probability, potentially high-impact incidents. The United States has experienced extreme space weather events during the past 150 years, most notably the Carrington Event of 1859 and the great geomagnetic storm of 1921.

[18] *United States Electricity Industry Primer*, Office of Electricity Delivery and Energy Reliability, United States Department of Energy, DOE/OE-0017, August 2016 Revised Edition.

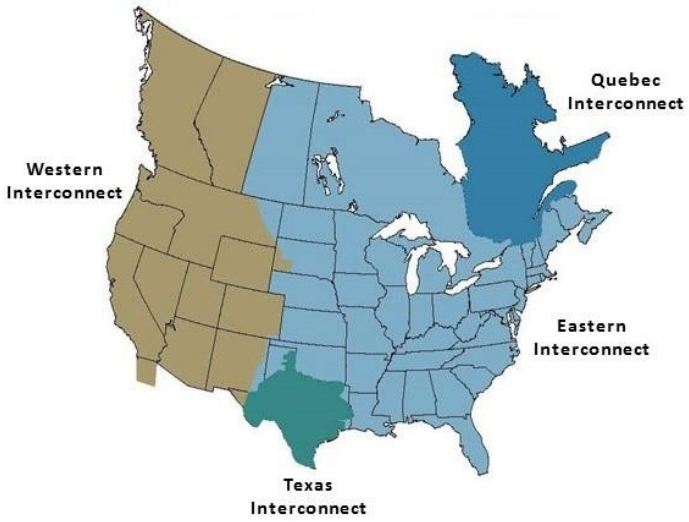

Figure 5: Map of Four North American Power Grid Interconnections[19]

The United States' bulk electric system (BES) consists of more than 360,000 miles of transmission lines, including approximately 180,000 miles of high-voltage lines connecting to about 7,000 power plants.[20] Power transmission lines facilitate the bulk transfer of electricity from a generating station to a local distribution network. These networks are designed to transport energy over long distances with minimal power losses, made possible by boosting voltages at specific points along the electricity supply chain.

Transmission lines consist of structural frames, conductor lines, cables, transformers, circuit breakers, switches, and substations.

Substations provide crucial links for generation and serve as key nodes for linking transmission and distribution networks to end-use customers. A substation generally contains transformers, protective equipment (relays and circuit breakers), switches for controlling high-voltage connections, electronic instrumentation to monitor system performance and record data, and firefighting equipment in the event of an emergency. There are over 55,000 substations in North America.

Transformers are critical equipment in delivering electricity to customers, but many are located in isolated areas. The loss of transformers at substations may represent a significant concern for energy security in the electricity supply chain due to the long lead time to design and build transformers, increased global demand in grid-developing countries, and limited domestic manufacturing capabilities. Transformers and their components are unique due to their specificity in design and application. Substations are highly specific to the systems they serve, which also limits the interchangeability of transformers. Replacing transformers, for example, is associated with a long delivery lead time, as they are generally difficult and costly to transport due to their considerable size and weight. Failure of even a single unit could result in temporary service interruption.

[19] North American Reliability Corporation.
[20] *United States Electricity Industry Primer*.

The production of an LPT ranges from approximately 12–24 months and involves contract procurement, design, manufacturing, testing, delivery, and installation as illustrated in Figure 6.

Figure 6: 2011 Large Power Transformer Procurement Process and Estimated Optimal Lead Time[21]

As a resiliency measure, some utilities keep backup transformers, or "spare transformers," for use during emergencies. Since high-voltage transformers can cost millions of dollars, utilities may opt to purchase a spare transformer or build redundancy into the system (e.g., being able to reroute power should a transformer fail) as part of their overall risk mitigation strategy.

Distribution

The power distribution system is the final stage in the delivery of electric power, carrying electricity out of the transmission system to individual customers. Distribution networks distribute electric power and consist of following main parts:

- Distribution substations
- Primary distribution feeders
- Distribution transformers
- Distributors
- Service mains

[21] *United States Electricity Industry Primer.*

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Appendix 1: Core Capability Decisions, Requirements, and Tasks

Incidents such as a long-term power outage require a broader set of atypical partners to accomplish the capability targets for the Response and Recovery Core Capabilities identified in the National Preparedness Goal.

The following tables discusses scenario-specific critical considerations, resource requirements, and actions for Core Capabilities beyond their all-hazards actions described in the Response and Recovery FIOP.

Table 5: Cross-Cutting Core Capability Considerations, Requirements, and Actions

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
Operational Coordination	• There will likely be multiple JFOs • There will be a need to integrate with the private sector	• Representatives to participate in any future planning activities	• Determine the need for a future planning cell (ESF #5) • Coordinate with the NBEOC (ESF #5) • Invite utility association representatives to participate in NRCC activities (ESF #5)
Planning	• FEMA Regional POIAs are being developed in certain regions	• Awareness of resource allocation and prioritization decisions • Awareness of energy restoration and prioritization spanning a large geographical area	• Develop a national support plan based on the concept of operations in the applicable Regional POIA (ESF #5) • Determine the need for a future planning cell (ESF #5) • Monitor private sector coordination in collaboration with CISA
Public Information and Warning	• Traditional means of providing information to the public will not be available without power (e.g., social media, TV, radios, text alerts, computer messages) • All disaster notifications and information must be made available to all people, including those with access and functional needs, simultaneously; therefore, preparedness planning with disability SMEs provides guidance on formats, platforms, and methods so that messaging is accessible to everyone	• Assessment of timeline for power and communications restoration • Awareness of ESF field activities that could be leveraged for message distribution • Awareness of resource allocation and prioritization decisions • Access to other federal agencies' communication methods, including technology and grassroots channels	• Identify alternative means for communicating information to the public (ESF #2, ESF #15) • Determine and address critical communication needs of vulnerable populations (ESF #6, ESF #8, ESF #15) • Assess agency memorandums of understanding to identify added capabilities, private sector capabilities, and FEMA National Radio System (ESF #2, ESF #15)

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
Infrastructure Systems	• Multiple CI systems will be impacted by a power outage requiring significant coordination with the CI sectors • All levels of government will determine prioritization of sector specific CI restoration • There will be a need to determine what the priorities are for funding energy restoration and eligibility requirements for the public/private sector to receive funding	• CI damage/impact assessments from SRMAs, ISACs, or CISA • Crews (e.g., transmission specialists) and necessary mechanical parts to restore CI • Generators and the expertise to assess, install, and maintain them • Teams and expertise to assess temporary emergency power requirements and install, operate, and maintain generators at critical facilities	• Activate USACE power generation teams (ESF #3) • Assess and prioritize healthcare facilities' reliance on power for sustaining ongoing operations (ESF #8) • Assess the energy impact of the incident, provide analysis of the extent and duration of energy shortfalls, and identify requirements to repair energy systems (ESF #12) • Coordinate with intergovernmental and private sector partners to identify requirements for temporary emergency power (ESF #3) • Coordinate with critical SRMAs to ensure consistency of information provided through the Secretary of Energy, the National Security Council, SCCs, and/or committees or other high-level coordinating structures as directed (ESF #12) • Establish a process for public and private sector utilities to gain access to the incident site(s) (ESF #2, ESF #12) • May liaise with states and locals on law enforcement support to establish and maintain a safe environment for infrastructure restoration (ESF #13) • Coordinate between government and the communications industry to assess communications needs required to coordinate restoration of power (ESF #2)

Table 6: Response Core Capability Considerations, Requirements, and Actions

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
Critical Transportation	• Prioritization of key resources and transportation requests such as fuel and interstate travel restriction waivers • Ensuring continuity of flow of resources through airports, ports, highways and the rail system • Accessibility of transportation routes, rest areas, etc. for people with disabilities	• Access to fuel supply and fuel distribution points • Necessary waivers and permits to move resources into the affected area quickly and efficiently • Transportation assets to help restore CI	• Employ the DPA, as required, to support restoration priorities, generator productions, and deployment. (ESF #5, ESF #7) • Identify priority route access requirements for restoration workers (ESF #1) • Facilitate the implementation of regulatory relief mechanisms across the critical transportation sector (ESF #1) • Coordinate requests for fuel waivers (ESF #12) • Facilitate coordination with groups for interstate travel and mutual aid (ESF #1) • Ensure reporting of transportation infrastructure degradation (ESF #1)
Environmental Response/ Health and Safety	• Public messaging must include safety issues pertaining to power outage	• Status of emerging or anticipated environmental impacts	• Address and promulgate information about power outage safety issues, including food safety (from lack of food refrigeration) and carbon monoxide poisoning (from extended use of power generators) (ESF #5, ESF #8, ESF #11)
Fatality Management Services	• Morgue or mortuary services rely on air conditioning and removal to maintain optimum condition of the deceased	• Fuel to support the movement of bodies • Power to support morgue services (i.e., refrigeration)	• Identify alternate fuel services to support mortuary services (ESF #8, ESF #7)
Fire Management and Suppression	• Ensure prioritization for restoration of emergency services infrastructure, including fire stations, 9-1-1 and dispatch centers, critical communication sites, and refueling facilities for fire apparatus, water systems components critical for fire suppression • Maintain critical access routes to affected utility locations	• Situational awareness on affected utility locations to prioritize response efforts • Status on whether appropriate systems are deactivated at the affected locations • Fuel for responders to reach impact area across state lines (e.g., need for waivers) • Minimum/maximum requirements for diesel	• DOE and utility coordination for prioritizing and initiating fire suppression efforts (ESF #4, ESF #12) • Ensure communications infrastructure reporting of 9-1-1, dispatch, and first responder communications impacts (ESF #2) fuel resources, including Secretary of Energy decisions associated with the drawdown of the

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
	• Deactivate appropriate systems at affected locations to allow appropriate application of fire suppression techniques • Distribution of generators may or may not follow prioritization order for a short-term power outage (i.e., life-saving facilities, life-sustaining facilities, and other municipal facilities)	fuel to support CI per location type and generator size • Estimated daily fuel requirements for critical transportation • Fuel burn rates from each impacted state's emergency operations plan	Strategic Petroleum Reserve (SPR), Northeast Home Heating Oil Reserve, and Northeast Gasoline Supply Reserve) (ESF #12, ESF #7)
Mass Care and Emergency Assistance Services	• Decision on whether to evacuate populations will inform appropriate mass care and emergency services actions • Backup power resources should be considered a high priority to support congregate care and non-congregate care facilities • Waivers may be needed for expeditious movement of people and allocation of scares medical resources across state lines • A framework for allocation should be considered due to a scarcity of human and material support resources. • Backup power and fuel should be prioritized for fixed and mobile feeding sites and sites for distribution of emergency supplies	• The ability to provide food, water and shelter with a reliable power source and access to food and potable water supply (potentially) outside the affected area • Fuel for shelters and feeding stations • Fuel for volunteers to reach the impacted public and assess their needs	• Identify additional fuel and transportation requirements and other resources needed to support the distribution of food, water, and emergency supplies for survivors (ESF #7) • Coordinate with DOE and logistics to determine the most effective use of and locations for accessible mass care resources (facilities, equipment, and supplies) based on restoration priorities (ESF #6) • Assess the viability of applying a zone approach to prioritize limited resources in areas with short-term power outages for evacuations and in communities hosting survivors from areas where there are long-term outages (ESF #12, ESF #6) • Coordinate with ESF #8 and Healthcare Coalitions, where appropriate, for enhanced support to manage higher levels of needs in mass care facilities due to factors such as depopulation of medical facilities and influx of survivors who rely upon electricity-dependent medical and assistive equipment and technology (ESF #6) • Identify options and implement programs for

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
			providing housing assistance for survivors whose homes have no long-term power but are not damaged or inaccessible (ESF #6)
Mass Search and Rescue	• None identified	• None identified	• Implement actions consistent with emPOWER and local databases to identify and support life checks for the elderly, people with disabilities, and others on life-sustaining medical equipment (ESF#9)
On-Scene Security and Protection	• Access points may require enforcement mechanisms to ensure authorized personnel and resources can proceed through • Intra-state coordination may be required to ensure neighboring states avoid restricting entry by closing access points, thus restricting the flow of resources, response/recovery personnel and evacuees • Jails and detention centers may require relocation • Civil disturbance (rioting, looting, etc.) may require additional law enforcement resources	• Fuel for security vehicles • Backup communications systems to maintain operational coordination • Resources to transport prisoners to new locations • Law enforcement resources to respond to civil disturbances	• Liaise with SLTT authorities to ensure a safe environment for infrastructure restoration (ESF #13) • Identify fuel needs for equipment and transportation to support operations (ESF #7) • Coordinate with local, state, Tribal Nations, territorial, and federal government agencies responsible for jails, detention centers, and prisons to ensure that any necessary prisoner relocation efforts are conducted (ESF #13) • Coordinate with SLTT authorities to ensure sufficient law enforcement resources are available to respond to civil disturbances
Operational Communications	• Consideration of key communications resources to support continuity of government at all levels, effective command and control of response and recovery capabilities, and public messaging in a degraded communications environment	• Fuel for government fixed and mobile communications capabilities • Coordination of fuel, access, and security for private sector capabilities critical to lifesaving and life-sustaining operations and to public alerts and warnings	• Provide timely legal counsel to federal decision-makers for use of federal communications resources in support of private sector entities (ESF #2) • Facilitate transition from government-provided temporary restoration to commercial long-term restoration (ESF #2)
Public Health, Healthcare, and Emergency Medical Services	• Hospitals depend on daily shipments of goods and fuel	• Alternate fuel sources or contingency plans to account for limited generator supply	• Coordinate patient movement, if required (ESF #8)

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
	• Hospitals depend on the availability of potable water and sanitary wastewater treatment • Diversion plans for hospitals will not work; other nearby hospitals will also be impacted • Hospitals and healthcare facilities may require patient evacuation to centers with electricity; this could be hours away depending on the breadth of the outage • Response times for emergency medical services will increase • Individuals who have power-dependent durable medical equipment or implantable devices who live in the impacted community require assistance with power restoration or evacuation • Accessibility of medications for people with behavior or other mental health needs should be planned for, including provisions for access to compound pharmacies and/or pharmaceuticals	• A patient movement cell to coordinate the evacuation of patients	• Coordinate on alternate fuel sources (ESF #7, ESF #8) • Implement strategies to assess and monitor the public health, disease surveillance, and injury prevention (ESF #8)
Situational Assessment	• It may be difficult to obtain situational awareness until power is restored and communications are up and running	• Status of restoration efforts to include number of customers without power; percentage restored, restoration estimates	• Coordinate with DOE, which will provide the status of restoration and energy sector impacts (ESF #5) • Coordinate with DHS/NCC, which will provide status of restoration and communications sector impacts (ESF #2)
Economic Recovery	• Consideration to prioritize key resources to access bank assets (e.g., cash, monetary notes) and/or transportation and security assets to move currency into or near the impacted area • Appropriate authorities and financial resources are identified and	• Clear instructions/ guidance from the federal government regarding financial resources available • Situational awareness on affected populations to determine potential economic impacts and assistance needed	• Develop a multidimensional strategy capable of supporting economic recovery and enhancing whole community resiliency in absence of power

Core Capability	POIA-Specific Critical Considerations	POIA-Specific Resource Requirements	POIA-Specific Critical Actions (ESF with Primary Responsibility)
	communicated to state/local officials		
Health and Social Services	• Consideration to prioritize services for relocated households, to include access to transportation, schools, postal services, fire/police, grocery stores, and educational services for relocated students • Consideration to prioritize healthcare infrastructure in a timely manner • Due to lack of access, it may be difficult getting inspectors into the affected areas • Healthcare providers may not be able to get to their places of work	• Critical dependence on water purification and wastewater treatment • Greater amounts of specifically trained personnel • Tracking clients and/or affected populations needing assistance	• None identified
Housing	• Identify and provide timely, appropriate and accessible temporary housing assistance that can support the volume of disaster survivors and their needs following a long-term outage • Housing demand for responders (both public and private) may exceed capacity of impacted area • Consider funding mechanisms are in place for housing costs for the “host” states in receiving evacuees • Large multi-family properties may be habitable if elevators and emergency lighting were operational; this might reduce the impact to mass care and emergency assistance facilities, particularly for housing for the elderly	• Visibility of available accessible housing options • Difficulty obtaining alternate housing in the affected areas if power is not available	• Implement the Housing Annex

Executive Decisions

Throughout a long-term power outage, key strategic and operational decisions will be required. This may include decisions about prioritizing resources and implementing waivers, among other issues.

The following table identifies some of the key decisions, identified by Core Capabilities, that either the senior-level policy coordination committee or the NRCC may require. This does not include all the decisions identified by core capability or CI sector that may be made at an agency level.

Table 7: Executive Decisions

Decision	Essential Elements of Information	Core Capability with Primary Responsibility
Application of the Power Outage Incident Annex: Upon notification from DOE that the power outage is likely to continue for an extended period, the FEMA Administrator, in collaboration with the Secretary of DOE, may decide to implement the constructs in this annex.	• The battle rhythm of the policy coordination committee and when it requires decision support • A need to coordinate response and recovery actions beyond traditional coordination mechanisms • What functions/issues require policy decisions that need to be elevated	Planning
Stafford Act support to private sector entities. Under the Stafford Act, the federal government does not provide support to investor-owned, for-profit utilities. In rare instances and on a case-by-case basis, the federal government may provide certain support for an exceptionally limited period to for-profit utilities for lifesaving or life-sustaining missions. The federal government may consider regulatory relief for private institutions and should synchronize its operations to enable, support, and otherwise not contradict private sector restoration operations.	• A governor's request for support for lifesaving or life-sustaining missions • Clarification of the duration and level of support required, needed to receive FEMA General Counsel and Administrator approval	Planning
Core Capability Prioritization: Resources to support restoration efforts are likely to be limited. Decisions will need to be made to prioritize federal operations to support the most optimal restoration of the 16 CI sectors based upon interdependencies and cascading impacts.	• Analyses of interdependencies and risk assessments • Infrastructure of Concern List • Status of restoration provided by DOE • Status of private sector businesses provided by the NBEOC, SRMAs, ISACs, ESFs, and CISA	Planning
Resource Prioritization: Resources to support all the people impacted by the power outage will be limited. Therefore, decisions will need to occur concerning how to employ those resources in areas to achieve the most positive impact for the largest number of people. The course of action in Concept of Operations will be reviewed and refined by leadership to prioritize resources based on the specifics of the incident.	• Areas in which power will be restored within 2 weeks • Understanding of the core capabilities required to restore power in those areas (e.g., debris removal, port openings, public security, and other public assistance) • Areas with the projected shortest duration of power outage • Whether states have decided to encourage or enforce evacuations • Areas with the densest populations and survivors that cannot self-evacuate	Planning

Decision	Essential Elements of Information	Core Capability with Primary Responsibility
	• Similar resource requirements across jurisdictions	
Suspension of highway regulations to allow rapid delivery of restoration capabilities: To expedite the delivery of critical resources, either for restoration or to support survivors, certain regulations governing emergency transportation may need to be waived by applicable federal authorities. Other regulations governing emergency transportation may need to be waived by applicable state and local authorities.	• Whether delays exist in transporting critical resources in a timely manner • Whether responders are encountering challenges in the existing framework for transportation permitting • The quantifiable benefits of waiving highway regulations (e.g., number of hours by which response time is increased) • Impacts to other sectors or ongoing activities	Critical Transportation
Evacuation: Local, state, and federal officials will evaluate whether an evacuation is necessary depending on the scope of the incident, status of the grid and CI sector restoration efforts, and immediate health and safety concerns. SLTT governments may require federal support for coordination of evacuations (e.g., general population; patient). Immediate support for emergency backup power or restoration prioritization may depend on evacuation decisions	• Areas in which power will be restored within 2 weeks • Which, if any, states have decided to encourage or enforce evacuations • Trigger points for evacuation for each state • Areas with the densest populations and survivors who need assistance evacuating • Which states are available to accept evacuees • Available transportation resources • Which states have implemented contraflow traffic operations to facilitate evacuation • Availability and locations to implement refueling of evacuation vehicles • Number of patients requiring evacuation and medical transport assets	Critical Transportation Mass Care Services Public Health, Healthcare, and Emergency Medical Services

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Appendix 2: Critical Infrastructure Sector Interdependencies

The NIPP denotes 16 CI sectors, and the reliance of virtually all industries on electric power and fuels means that all sectors have some dependence on the energy sector. It is critical to understand the impacts of a long-term power outage on the other 15 sectors to wisely influence national policy and prioritize critical resource allocation.

Energy sector interdependencies are highly complex and exist at different levels, so a "system of systems" approach is required to address linkages within and among the following:

- Facilities and assets
- Networks (physical, cyber)
- End-to-end systems
- Communities, regions, and states
- States and multi-state groups
- Connections across national borders or global

These linkages may be physical, cyber, or virtual and can cause cascading and escalating failures (or in the case of co-located infrastructure assets, can result in common cause failures).

Disruptions within a single infrastructure can generate disturbances within other infrastructures and over long distances, and the array of interconnections can extend or amplify the effects of that disruption, resulting in impacts to the whole community.

Lifeline Functions

The NIPP identifies certain lifeline functions that are essential to the operation of most CI sectors. The term "lifeline functions" generally refers to a sector that provides indispensable services that enable the continuous operation of critical business and government functions, and that would risk human health and safety or national and economic security if compromised or not promptly restored. These lifeline functions include communications, energy, transportation, and water. These sectors provide the most essential services that underlie a regional economy. Figure 7 describes basic interdependencies between the lifeline functions.

(Sub)sector Generating the Service (down) & (Sub)sector Receiving the Service (across)	ONG	Electricity	Transportation	Water	Communication
ONG		Fuel to operate power plant motors and generators	Fuel to operate transport vehicles	Fuel to operate pumps and treatment	Fuel to maintain temperatures for equipment; fuel for backup power
Electricity	Electricity for extraction and transport (pumps, generators)		Power for overhead transit lines	Electric power to operate pumps and treatment	Energy to run cell towers and other transmission equipment
Transportation	Delivery of supplies and workers	Delivery of supplies and workers		Delivery of supplies and workers	Delivery of supplies and workers
Water	Production water	Cooling and production water	Water for vehicular operation; cleaning		Water for equipment and cleaning
Communication	Breakage and leak detection and remote control of operations	Detection and maintenance of operations and electric transmission	Identification and location of disabled vehicles, calls and roads; provision of user service information	Detection and control of water supply and quality	

Figure 7: Lifeline Functions[22,23]

CI Sector Impacts

Table 8 and Table 9 summarize the impacts to the other 15 CI sectors that a long-term loss of power has on its mission, the critical information requirements, and potential decisions and coordination points. The information in this table will assist in identifying initial impacts to the other CI sectors that may result in additional actions during the response. This data will be validated as part of the crisis action planning for the long-term power outage.

Table 8: Lifeline Sector Impacts, Critical Information Requirements, and Decision Points in a Power Outage

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
Communications SRMA: • DHS Office of Cybersecurity and Communications (CS&C) NCCIC	• Communication networks (wireline, wireless, cable, satellite, broadcast) • Communications facilities • Cyber infrastructure	• System operators may not be able to maintain telephone, cellular, email or dedicated broadband networks for communications • Ability to monitor, generate, and control the delivery of	• Backup communications systems in the impacted area • Ability to route communications through other areas/regions • Communications priorities/needs for Mass Care and Emergency Assistance,	• Federal communications resource priorities to support continuity of government, federal command and control, and public alerts and warning (ESF #2) • Highway regulation suspensions to

[22] Graphic is from the *2015 Energy Sector Specific Plan*.

[23] Interdependency between nuclear and electricity on base power for nuclear generation.

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
		electricity may be affected	evacuations, and re-entry • Fuel distribution plans	allow rapid delivery of commercial communication restoration capabilities (ESF #1) • Fuel distribution priorities (ESF #12) • Security for critical facilities (ESF #13) • Access to sites and impact areas (ESF #13) • Surface transportation regulatory relief to allow rapid delivery of commercial communication restoration capabilities (ESF #1) • Power industry restoration plans and priorities (ESF #12)
Transportation Systems SRMAs: • DHS (TSA office of Security Policy and Industry Engagement and USCG Office of Port and Facility Compliance) • DOT (Office of the Secretary S-60 Office of Intelligence, Security and Emergency Response)	• Aviation • Highway and motor carrier • Maritime transportation system • Mass transit and passenger rail • Pipeline systems • Freight rail • Postal and shipping	• Limited or no power for overhead transit lines • Limited or no power for railroads switching and signals • Limited or no ability to move/pump fuel at gas stations • Limited generator capacity of public transit/SCADA, traffic signal control, tracking and routing (supply chain functioning) • Loss of ticketing and check-in at airports and ticketing vending machines for public transit • Loss of badge detectors for secure	• Transportation infrastructure status • Community support needs and transport requirements • Available transportation resources • Determined staging areas for relief operations	• Need for evacuation transport, if required (ESF #1, ESF #5) • Fuel delivery priorities (ESF #7)

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
		identification display areas or other controlled access areas • Loss of closed caption television, low-light television, motion detectors, and other electronic surveillance tools • Loss of communications such as security alert functions and public address systems • Loss of lighting in tunnels and underground stations • Loss of fire/life/safety systems and alarms		
Water and Wastewater SRMA: • EPA Water Security Division	• 153,000 public drinking water systems • More than 16,000 publicly owned wastewater treatment systems	• Drinking water utilities may have limited backup power and may have to reduce operations, with potential impacts on water pressure and quality; some drinking water utilities may cease operations • Wastewater utilities may have limited backup power and may have to reduce operations, leading to discharges of partially treated or untreated sewage; some wastewater utilities may cease operations	• Drinking water and wastewater utilities' supply of emergency generators, fuel, and treatment chemicals	• Prioritizing generators, fuel, and chemicals to sustain drinking water and wastewater services at impacted utilities (ESF #3, ESF #10)

Table 9: Other CI Sector Impacts, Critical Information Requirements, and Decision Points in a Power Outage

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
Chemical SRMA: • CISA	• Basic chemicals • Specialty chemicals • Agricultural chemicals • Pharmaceuticals • Consumer products	• Directly affect all chemical facilities located in the impacted region • Limited or no ability to extract coal or perforate gas and oil wells	• Status of chemical facilities in impacted region • Cascading effects on other chemical facilities that are dependent on goods or materials provided by the affected facilities	• Decisions on the chemical sector's resource sharing methodology (ESF #5; Infrastructure Systems RSF)
Commercial Facilities SRMA: • CISA	• Entertainment and media • Gaming • Lodging • Outdoor events • Public assembly • Real estate • Retail • Sports leagues	• Impact to facilities in a region • Ability to house responders if hotels are not available • Ability to provide goods and services	• Status of commercial facilities in impacted region • Which facilities have backup generators and how long they will last	• Trigger point for reallocation of national critical resources (ESF #5) • Prioritizing energy restoration to commercial facilities (ESF #5, ESF #12) • Coordinating status of backup communications , and public alerts and warning (ESF #2)
Critical Manufacturing SRMA: • CISA	• Primary metals manufacturing • Machinery manufacturing • Electrical equipment, appliance, and component manufacturing • Transportation equipment manufacturing	• Ability to manufacture power generators and other equipment for energy restoration	• Which manufacturers have backup generators • Which manufacturing facilities have been impacted in the incident area	• Local, state, and/or federal governments require assets to be manufactured/provided to assist in the energy restoration process (ESF #7)
Dams SRMA: • CISA	• Water storage and irrigation • Sediment and flood control • Electricity generation • "Black start" capabilities • Peaking power	• Disruptions to hydroelectric operations could create serious supply deficits and hinder the movement of key commodities if navigation locks do not work • Impacted locks are crucial to	• Status of dams/locks in impacted region • Which facilities have backup generators and how long they will provide power • Which facilities have "black start" capabilities	• Facilities need to initiate "black start" capabilities (ESF #3, ESF #12)

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
		shipping coal or fuel and no alternative transportation modes are available to transport needed commodities	• Whether impacted locks affect the shipment of coal or fuel needed to produce electricity or fuel generators	
Defense Industrial Base (DIB) SRMA: • DOD Office of the Secretary of Defense, Policy	• Weapon system platforms • Military components • Military expendables	• Ability to produce goods and services required for weapon systems	• Expected restoration timelines for affected DIB facilities	• Whether DOD will change expectations of DIB deliverables given a long-term disruption (ESF #5, ESF #7)
Emergency Services SRMA: • CISA	• Law enforcement • Fire and rescue services • Emergency management • Emergency medical services • Public works	• Ability to maintain critical emergency services sector operations during disasters • Ability to fuel its service vehicle fleet • Maintain redundant emergency communications	• Emergency managers controlling access to damaged/ impacted areas will require personally identifiable information and/or equipment information from utility workers to give them access to begin restoration activities	• Knowledge of restoration timing estimates to maintain response capabilities (ESF #12) • Emergency communications and infrastructure restoration to maintain response capabilities (ESF #2)
Financial Services SRMA: • TREAS Office of Critical Infrastructure Protection and Compliance Policy	• Deposit, consumer credit, and payment systems products • Credit and liquidity products • Investment products • Risk transfer products	• All major exchanges can be serviced by backup power however, the duration of all backup power generation is limited by availability of fuel and other factors; Moreover, this is inconsequential if all trading institutions are similarly affected, as most institutions would not conduct business	• Status of major equities exchanges and fixed income markets • Access to financial institutions' contingency plans to understand how they would mitigate the effects in an impacted region	• Access to support backup capabilities (such as fuel for generators) (ESF #3, ESF #7) • Rationing available resources across other critical sectors communities (ESF #5, Economic Recovery RSF)

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
		• Inability of major exchanges and financial functions to rely on robust communication networks • Offline automated teller machine networks would result in a critical cash shortage, with individuals unable to access checking and savings accounts through normal means • As card transactions become more prevalent for everyday purchases, the impact of an outage impacting point of sale payments systems would be significant		
Food and Agriculture SRMAs: • USDA Office of Homeland Security and Emergency Coordination • Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Analytics and Outreach	• Food supply • Processing, packaging, and production • Agricultural and food product processing, storage, transportation and distribution • Agricultural and food supporting facilities • Regulatory, oversight, and industry organizations • Other agriculture and food	• Ability to provide and store food • Ability to ensure safety of food products • Health and well-being of livestock and crops	• Which facilities have been impacted and resultant disruptions or loss of capacity • Amount of time until operations can resume following restoration of power • Amount of time until operations can resume following restoration of interdependent sector(s) services (e.g., water, transportation, communication) • Cascading effects in the supply and distribution chain	• Authorize the Disaster Supplemental Nutrition Assistance Program (ESF #11)

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
Government Facilities SRMAs: • DHS (Federal Protective Service) • General Services Administration Office of Mission Assurance Security and Special Programs	• Buildings owned by governments • National monuments and icons • Educational facilities (kindergarten through college) • Public facilities • Offices and office building complexes • Housing for government employees • Correctional facilities • Embassies, consulates, and border facilities • Courthouses • Maintenance and repair shops • Libraries and archives • Non-public facilities • Research and development facilities • Military installations • Records centers • Space exploration facilities • Storage facilities for weapons and ammunition, precious metals, currency, and special nuclear materials and waste • Warehouses to store property and equipment	• Ability to operate government facilities • Ability to operate educational facilities, labs, and research facilities • Security of federal facilities • Disruption of critical information technology (IT) systems	• Cascading effects on government facilities that support national and primary mission essential functions • Status of backup communications systems in the impacted area • Status and duration of backup generators in government CI facilities • Expected restoration timelines for affected facilities • Identification of threat actors, intrusion methods, and network vulnerabilities for a man-made incident	• Prioritizing federal resources to support continuity of government and continuity of operations, federal command and control, and public alerts and warning (ESF #5) • Prioritizing the interruption and restoration of government services such as issuance of entitlement benefits • Coordinating on status of backup communications, and public alerts and warning (ESF #2)
Healthcare and Public Health SRMA: • HHS ASPR	• Direct patient care • Healthcare information technology • Health plans and payers	• Acute care hospitals with emergency service provision have generator power for only a few days	**Hospitals in Affected Area:** • Patient counts and bed availability • Generator and fuel status to keep facilities running	• Whether to initiate mass patient movement plans (ESF #8) • Coordinating fuel and generator

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
	• Mass fatality management services • Medical materials • Laboratories, blood, and pharmaceuticals		• Which departments are offline or hampered • Status of blood supply • Status of medications and medical supply • Staff availability and/or relocation • Status of health clinics in affected areas • Which hospitals are open for what services • Emergency communications and infrastructure restoration to maintain response capabilities (ESF #2 **Access and Functional Needs Accommodations:** • Whether at-risk populations with medical, behavioral health and social service needs are fulfilled • Whether jails and prisons are capable of providing necessary medical care • Status of Emergency Medical Services in the area, including response and transport times of patients • Fuel status • Response and transport times of patients • Availability of mental health resources • Drug and alcohol dependent related arrests and disturbances • Morgue availability	support for healthcare facilities (ESF #7)

Sector/SRMA	Sector Overview	Impacts on Sector During a Power Outage	Critical Information Requirements	Potential Decision Points and ESF/RSF Coordination Points
Information Technology SRMA: • DHS CS&C	• IT products and services • Incident management capabilities • Domain name resolution services • Identity management and associated trust support services • Internet-based content, information, and communications services • Internet routing, access, and connection services	• Major power outage through sophisticated cyberattack could result in possible breakdown of a single interoperable internet, and resulting failure of governance policy	• Identifying threat actors, intrusion methods, and network vulnerabilities are critical to mitigation and long-term defensive strategies	• Changes to cybersecurity resiliency protocols (ESF #2)
Reactors, Materials, and Waste SRMA: • DHS • CISA	• Commercial nuclear power plants • Non-power reactors used for research, training, and radioisotope production • Fuel-cycle facilities • Nuclear and radioactive materials used in medical, industrial, and academic settings	• Directly affect offsite power to all nuclear plants located in the impacted region	• Status of nuclear power plants in the impacted area • Status of the grid to ascertain if nuclear power plants can continue to generate power or go into a controlled shutdown	• NRC regulations trigger controlled shutdown using onsite power (ESF #5, ESF #12)

CISA Infrastructure of Concern List

CISA produces an Infrastructure of Concern (IOC) List during incidents that serves as a decision support tool to inform resource allocation and prioritization decisions. The IOC List prioritizes the physical infrastructure facilities that are most likely to be impacted by a power outage or its cascading effects. Disruption of IOC List could result in loss of life or degrade the essential government, public health, safety, or economic functions of the impacted area, region, or the nation.

Incident-specific analyses of the threat to, vulnerabilities of, and potential consequences from the disruption of CI in the impacted area are the basis of the IOC List. Infrastructure assets on the IOC List are selected based on their criticality, the potential impacts the infrastructure may have on the restoration and recovery activities in the area, and the consequence of disruption. Each asset on the IOC is assigned a priority level based on the overall impacts to its operations based on the power outage.

- **Priority 1** (High Consequence of Loss) – Includes infrastructure which may have regional or national impacts or is critical for immediate response operations.
- **Priority 2** (Moderate to High Consequence of Loss) – Includes infrastructure where the consequence of loss may cascade beyond just the local/regional area. This infrastructure may support incident response operations.
- **Priority 3** (Low to Moderate Consequence of Loss) – Includes infrastructure with a low to moderate consequence, but which is provided for situational awareness for response activities.

Infrastructure analysts update the IOC List as required to reflect evolving changes based on restoration and response activities.

CI Sector Coordination and Information Management

Certain information is required to help facilitate decision support and operations for a long-term power outage. Information may be required from federal partners, states, electric companies, or other partners. General categories of CIRs are noted the Critical Information Requirements section; however, supplemental information will likely be required depending on the specifics of the incident. This information will be used to inform the key executive decisions.

The categories for the RFI process may include but are not limited to:

- Incident impacts on CI sector (cascading effects)
- Sector priorities and federal support requirements (e.g., route clearance, public safety/security, regulatory relief)
- National security issues

- Requirements to synchronize sector and federal response/recovery concept of operations (e.g., responder housing, deployment phasing)
- Restoration operations status

The NRCC, as the national center through which federal response and recovery activities are coordinated, supports the incident response informational needs of the CI sectors and initiates RFIs based on needs of senior decision-makers at the White House or cabinet members with authority for aspects of the response.

For information specific to an ongoing request for federal assistance, the NRCC distributes the RFI to the appropriate ESF or RSF. This will involve the appropriate ESF Coordinator within the NRCC coordinating with ESF representatives in the various JFO/RRCCs. The NRCC will also coordinate with the NICC for sector-specific information other than energy. Figure 8 illustrates a high-level overview of the process flow for RFIs.

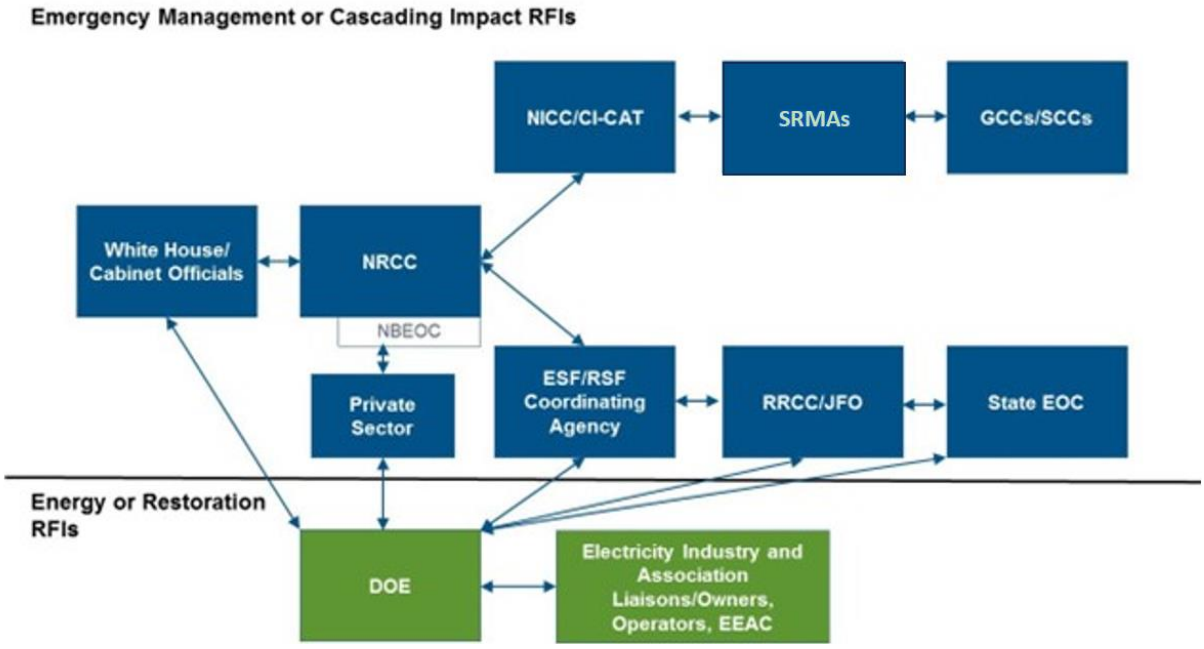

Figure 8: RFI Basic Process Flow for Power Outages

Many of the ESFs have a direct relationship with certain SRMAs. Coordination between ESFs/RSFs and SRMAs of the CI sectors ensures that the information provided is accurate. RFIs are generated and received by both ESFs and SRMAs, and the flow of information shown in Figure 8 is bidirectional.

In cases where RFIs originate with industry partners, those are usually managed first by the SRMA, which coordinates with its ESF counterpart. NBEOC and sector coordination calls that are conducted during incident response activities coordinate and align RFI requirements and status among the private sector. For RFIs pertaining to the impacts and status of CI sectors that are not directly aligned to an ESF, the NRCC coordinates with the NICC to obtain information from the appropriate SRMA. The SRMAs coordinate with their sector-specific partners to obtain the information.

Attachment 1 to Appendix 2: Critical Infrastructure Sector Partners

The community involved in managing risks and restoration of CI is composed of partnerships among owners and operators; SLTT governments; federal government; regional entities; not-for-profit organizations; and academic sector. Sector and cross-sector partnership council structures are the key mechanisms for managing CI security and resiliency.

GCCs consist of representatives across various levels of government, as appropriate, to the operating landscape of each individual sector. The councils enable interagency, intergovernmental, and cross-jurisdictional coordination within and across sectors, and they partner with SCCs on public-private efforts.

SCCs are self-organized and self-governed councils whose members are CI owners and operators and their representatives. SCCs serve as principal collaboration points between the government and private sector CI owners and operators for sector-specific planning and collaboration.[24]

Table 10 identifies the various government and private sector partners who are key to the resiliency of the 16 CI sectors.

Table 10: CI Sector Partnerships[25]

Sector	GCC Membership	SCC Membership
Chemical	• DOC • DHS • U.S. Department of Justice (DOJ) • DOT • EPA	• Agricultural Retailers Association • American Chemistry Council • American Coatings Association • American Fuel and Petrochemical Manufacturers • American Petroleum Institute • BASF Corporation • Chlorine Institute, The • Compressed Gas Association • Council of Producers & Distributors of Agrotechnology • CropLife America • Dow Chemical Company • Fertilizer Institute, The • Institute of Makers of Explosives • International Institute of Ammonia Refrigeration • International Liquid Terminals Association • Louisiana Chemical Association • LSB Chemical LLC • National Association of Chemical Distributor • Praxair, Inc. • Society of Chemical Manufacturers and Affiliates

[24] *NIPP 2013*, pg. 12.

[25] Information was obtained from the DHS Critical Infrastructure Partnership Advisory Council Charters and Membership webpage (https://www.dhs.gov/cipac-charters-and-membership), dated December 29, 2016. Refer to the website for the most up-to-date membership rosters.

Sector	GCC Membership	SCC Membership
Commercial Facilities	• DHS • DOJ • GSA • HHS • USDA	• American Hotel and Lodging Association • Analytic Risk Solutions, LLC • Beacon Capital Partners • Boyd Gaming Corporation • Contemporary Services Corporation • Fort Hall Casino • International Association of Amusement Parks and Attractions • Mall of America • Marriott International • National Football League • National Retail Federation • Peppermill Resort Spa Casino • Real Estate Information Sharing and Analysis Center (ISAC) • Retail Industry Leaders Association • Sea World • Simon Property Group • Stadium Managers Association • Target • Tishman Speyer Properties • U.S. Tennis Association • Viacom
Communications	• DHS • DOC • DOD • DOE • DOI • DOJ • Federal Communications Commission (FCC) • Federal Reserve Board (FRB) • GSA • National Association of State Chief Information Officers • National Institute of Standards and Technology (NIST) • NRC • National Telecommunications and information Administration (NTIA) • United States Postal Service (USPS)	• 3U Technologies • Alcatel-Lucent • Alliance for Telecommunications Industry Solutions • AT&T • Century Link • Cincinnati Bell • Cisco Systems, Inc. • Clearwire • Computer Sciences Corporation • Computing Technology Industry Association • Consolidated Communications • Cox Communication • Fairpoint Communications, Inc. • Frontier • Harris Corporation • Hubbard Radio • Hughes Network Systems • Independent Telephone and Telecommunications Alliance • Internet Security Alliance • Intrado • Iridium • Juniper Networks • Level 3 Communications • Motorola • National Association of Broadcasters • National Cable & Telecommunications Association • National Telephone Cooperative Associations • NeuStar • Research in Motion • Satellite Industry Association

Sector	GCC Membership	SCC Membership
		• Sprint • Telcordia • Telecommunications Industry Association • Telephone and Data Systems, Inc. • Time Warner Cable • U.S. Internet Services Provider Association • U.S. Telecom Association • Verizon • Windstream
Critical Manufacturing	• DHS • DOC • DOD • DOE • DOI • DOJ • DOS • DOT • Small Business Administration (SBA)	• Aerojet, a GenCorp Inc. • Alexion Pharmaceuticals, Inc. • ArcelorMittal USA • Armstrong Marine Inc. • Boeing Company, The • Bridgestone Americas, Inc. • Briggs & Stratton • Carpenter Technology Corporation • Caterpillar, Inc. • Chrysler Group, LLC • Cisco Systems, Inc. • Cliffs Natural Resources, Inc. • Crane Aerospace & Electronics • Deere & Company • Delbia Do Company • Delphi Corporation • Ellanef Manufacturing • Emerson Electric, Co. • Fairchild SemiConductor • FarSounder, Inc. • Ford Motor Company • General Electric Company • General Motors Company • Goodyear Tire & Rubber Company • GrayGlass • Hercules Heat Treating Corporation • Intel Corporation • ITT Corporation • Johnson Controls, Inc. • Kohler Company • Lee Spring, Co. • Michelin North America • Mi-Jack Systems & Technologies • Mini Circuits • Navistar International Corporation • Nichols Brothers Boat Builders • Novelis, Inc. • Oregon Iron Works • Oshkosh Corporation • PACCAR, Inc. • Pelco by Schneider Electric • Penske Corporation • Raytheon Company • Remy International, Inc. • Rock Ventures, LLC • Rosco Vision Systems • S&L Aerospace Metals, LLC • Schweitzer Engineering Laboratories, Inc.

Sector	GCC Membership	SCC Membership
		• Smith & Wesson Holding Company • Steeler, Inc. • Summit Appliances, Inc. • TE Connectivity, Ltd. • ThyssenKrupp Stainless USA, LLC • United States Steel Corporation • United Technologies Corporation • Whirlpool Corporation • Zero International
Dams	• DHS • DOD • DOI • DOJ • DOL • DOS • FERC • Lower Colorado River Authority • State of Arkansas • State of California • State of Florida • State of New Hampshire • State of New Jersey • State of North Carolina • State of Pennsylvania • TVA • USDA	• Ameren Services Company • American Electric Power • Association of State Dam Safety Officials • Association of State Flood Plain Managers • Avista Utilities • Brookfield Renewable Energy • CMS Energy • Colorado River Energy Distribution Association • Dominion Resources • Duke Energy Corporation • Dynegy, Inc. • Exelon • Grant County Public Utility District, Washington • National Association of Flood & Stormwater Management Agencies • National Hydropower Association • National Water Resources Association • New York Power Authority • Northwestern Energy • Ontario Power Generation • Pacific Gas & Electric Company • Salt River Project Agricultural Improvement and Power District • SCANA Corporation • Seattle City Light • Southern California Edison • Southern Company • State of South Carolina, Public Service Authority • U.S. Society of Dams • Xcel Energy Corporation
Defense Industrial Base	• DOC • DOD • DOE • DHS • DOJ • DOS • TREAS	• Aerojet Rocketdyne • Aerospace Industries Association • Alliant Techsystems • American Society of Industrial Security (ASIS) International • American System • BAE Systems • Ball Aerospace & Technologies Corporation • Boeing Company, The • Booz Allen Hamilton • Computer Sciences Corporation • DRS Technologies, Inc. • Espy Corporation, The

Sector	GCC Membership	SCC Membership
		• General Atomics Aeronautical Systems Inc. • General Dynamics • General Electric Company • Honeywell International • HP White Laboratory, Inc. • Huntington Ingalls Industries • InCadence Strategic Solutions • L-3 Communications • Leidos • Lockheed Martin Corporation • MetiSpace Technology • National Classification Management Society • National Defense Industrial Association • Northrop Grumman Corporation • Orbital Science Corporation • Oshkosh Defense Corporation • Pratt & Whitney • Raytheon Company • Rockwell Collins • Rolls-Royce North America • Science Applications International Corporation • TASC, Inc.
Emergency Services	• DHS • DOD • DOI • DOJ • DOT • HHS • Interagency Board • USDA	• American Ambulance Association • American Public Works Association • Central Station Alarm Association • Electronic Security Association • Emergency Preparedness Resource Group • International Association of Chiefs of Police (IACP) • International Association of Emergency Managers • International Association of Fire Chiefs • International Public Safety Association • National Association of Security Companies • National Association of State Emergency Medical Services Officials • National Emergency Management Association • National Fire Protection Association • National Fusion Center Association • National Native American Law Enforcement Association • National Sheriffs' Association (NSA) • Securitas Security Services • Security Industry Association
Energy	• BPA • DHS • DOD • DOE • DOI • DOJ • DOS • DOT	**Electricity Subsector:** • American Electric Power • APPA • Arkansas Electric Cooperative • Avangrid • Canadian Electricity Association • Center for Strategic and International Studies

Sector	GCC Membership	SCC Membership
	• EPA • FERC • HHS • National Association of Regulatory Utility Commissioners (NARUC) • National Association of State Energy Officials • Natural Resources Canada • Public Safety Canada • SEPA • SWPA • TREAS • TVA • USDA • WAPA	• City Utilities of Springfield • Consolidated Edison • Dominion • Duke Energy • EEI • Edison International • Electric Power Supply Association • ENMAX Corporation • Exelon Corporation • Georgia System Operations Corporation • Great River Energy • Hawaiian Electric Industries, Inc. • Lincoln Electric System • MidAmerican Energy Co. • NERC • Norwich Public Utilities • NRECA • Nuclear Energy Institute • Old Dominion Electric Cooperative • PG&E Corporation • PJM • PPL Corporation • Santee Cooper • Southern Company • Xcel Energy **Oil and Natural Gas Subsector:** • American Exploration & Production Council • American Fuel & Petrochemical Manufacturers • American Gas Association • American Petroleum Institute • American Public Gas Association • Association of Oil Pipelines • Canadian Association of Petroleum Producers • Canadian Energy Pipeline Association • Energy Security Council • Gas Processors Association • Independent Petroleum Association of America • International Association of Drilling Contractors • International Liquid Terminals Association • Interstate Natural Gas Association of America • National Association of Convenience Stores • National Ocean Industries Association • National Propane Gas Association • Offshore Marine Service Association • Offshore Operators Committee • Society of Independent Gas Marketers Association • Texas Oil & Gas Association • U.S. Oil & Gas Association
Financial Services	• American Council of State Savings Supervisors	• Aetna • AIG

Sector	GCC Membership	SCC Membership
	• Board of Governors of the Federal Reserve System • Conference of State Bank Supervisors • Consumer Financial Protection Bureau • DHS • DOD • Farm Credit Administration • Federal Deposit Insurance Corporation • Federal Housing Finance Agency • FRB • FRB of Chicago • FRB of New York • National Association of Insurance Commissioners • National Association of State Credit Union Supervisors • National Credit Union Administration • North American Securities Administration Association • Securities Investor Protection Corporation • TREAS • United States Commodity Futures Trading Commission • United States Securities and Exchange Commission (SEC)	• American Bankers Association • American Council of Life Insurers • American Express • American Insurance Association • American Society for Industrial Security International • Bank Administration Institute • Bank of America • Bank of New York Mellon Corporation, The • BATS Exchange • BB&T • BCG Partners • BITS • Capital One • Charles Schwab Bank • ChicagoFIRST • Citigroup • Clearing House, The • CLS Group • Comerica • CME Group • Consumer Bankers Association • Convergex • Credit Union National Association • Depository Trust & Clearing Corporation, The • Equifax • Fannie Mae • Fidelity Investments • Financial Information Forum • Financial Services ISAC • First Data • FIS • Freddie Mac • Futures Industry Association • GE Capital Retail Bank • Goldman Sachs • Independent Community Bankers of America • Institute of International Bankers • Intercontinental Exchange, NYSE • International Securities Exchange • Investment Company Institute • John Hancock/Manulife • JP Morgan Chase • LCH Clearnet • Managed Funds Association • MasterCard • Money Market Institute • Morgan Stanley • NACHA – The Electronic Payments Association • NASDAQ Stock Market, Inc • National Armored Car Association • National Association of Federal Credit Unions • National Futures Association • National Stock Exchange

Sector	GCC Membership	SCC Membership
		• Navient • Navy Federal Credit Union • Northern Trust • Omgeo • Options Clearing Corporation • PNC • Property Casualty Insurers Association of America • RBS • Securities Industry Financial Markets Association • State Farm • State Street Corporation • Sun Trust • Synchrony Financial • U.S. Bank • Visa U-S-A Inc. • Wells Fargo
Food and Agriculture	• Alaska Government • American Association of Veterinary Laboratory Diagnosticians • Association of Food and Drug Officials • Association of State and Territorial Health Officials • Clemson University, South Carolina Department of Plant Industry • Commonwealth of Virginia, Department of Agriculture • DHS • DOC • DOD • DOE • DOI • DOJ • DOS • EPA • HHS • Iowa Department of Inspection and Appeals • Multistate Partnership for Security in Agriculture • National Assembly of State Animal Health Officials • National Association of County and City Health Officials (NACCHO) • National Association of State Departments of Agriculture • National Center for Foreign Animal and Zoonotic Disease Defense • National Environmental Health Association • Navajo Nation, The • Sandia National Laboratories • Southern Agriculture & Animal Disaster Response Alliance • State of California, Department of Food and Agriculture	• Ahold USA, Inc. • American Bakers Association • American Feed Industry Association • American Frozen Food Institute • American Meat Institute • American Veterinary Medical Association • Archer Daniels Midland Corporation • Association of Food Industries • Cargill • Coca-Cola Company, The • ConAgra Foods, Inc. • Consumer Specialty Products Association • CropLife America • Dairy Institute of California • Dean Foods Company • Deloitte & Touche LLP • Food Marketing Institute • General Mills • Giant Food, LLC • Grocery Manufacturers Association • Ingredion, Inc. • International Bottled Water Association • International Dairy Foods Association • International Food Service Distributors Association • Juice Products Association • Kellogg Company • Kraft Foods Global, Inc. • Kroger Company, The • Land O' Lakes, Inc. • Marriott International • McCormick & Company, Inc. • National Association of Manufacturers • National Cattlemen's Beef Association • National Chicken Council • National Corn Growers Association • National Fisheries Institute • National Grain and Feed Association • National Grocers Association • National Milk Producers Federation

Sector	GCC Membership	SCC Membership
	• State of Florida, Department of Agriculture and Consumer Services • State of Kansas, Department of Agriculture • State of Michigan, Department of Agriculture • State of Minnesota, Department of Agriculture • State of New Mexico, Department of Agriculture • State of Oklahoma, Department of Public Health • State of Texas, Animal Health Commission • State of Texas, Department of Agriculture • State of West Virginia, Department of Agriculture • University of Kentucky, College of Agriculture, Cooperative Extension Service • University of Minnesota, Food Protection and Defense Institute • USDA	• National Oilseed Processors Association • National Pork Board • National Pork Producers Association • National Renderers Association • National Restaurant Association • North American Millers' Association • PepsiCo, Inc. • Publix Super Markets, Inc. • SES, Inc. • Starbucks Coffee Company • Sugar Association, The • Super Store Industries • Texas Cattle Feeder's Association • United Fresh Produce Association • USA Rice Federation
Government Facilities	• Administrative Office of the United States Courts • Architect of the Capitol • City of Fort Worth, TX • Department of Veterans Affairs • DHS • DOD • DOE • DOI • DOJ • DOL • DOS • DOT • EPA • FCC • Federal Trade Commission • FRB • GAO • GSA • HHS • U.S. Department of Housing and Urban Development • National Aeronautics and Space Administration • National Archives and Records Administration • National Capital Planning Commission • National Counterterrorism Center (NCTC) • NIST • NRC • Office of the Director of National Intelligence (ODNI)	N/A

Sector	GCC Membership	SCC Membership
	• Office of Personnel Management (OPM) • SEC • Smithsonian Institute • Social Security Administration • State of Maryland • State of Massachusetts • State of Michigan • State of Texas • TREAS • United States Capitol Police • United States Commodity Futures Trading Commission • United States Department of Education (DoED) • United States Trade Representative • USDA • USPS	
Healthcare and Public Health	• American Association of Poison Control Centers • American Public Gas Association • Association of Public Health Laboratories • Association of State and Territorial Health Officials • Centers for Disease Control and Prevention • Commonwealth of Virginia, Department of General Services • Commonwealth of Virginia, Department of Veterans Affairs and Homeland Security • County of Hennepin (Minnesota), Public Health • County of Nassau (New York), Department of Health • Department of Veterans Affairs • DHS • DOD • DOE • DOI • DOJ • DOS • DOT • HHS • NACCHO • National Indian Health Board • Sandia National Laboratories • Southern Nevada, Health District • State of Connecticut, Department of Public Health • State of Maryland, Department of Health • State of Michigan, Department of Health • State of New Jersey, Office of Homeland Security and Preparedness	• Abbott Laboratories • Advanced Medical Technology Association • Adventist Health System • Aetna, Inc. • Alexian Brothers Health System • Alexion Pharmaceuticals, Inc. • American Academy of Nurse Practitioners • American Academy of Pediatrics • American Academy of Physicians Assistants • American Association of Blood Banks • American Association of Colleges of Pharmacy • American Association of Tissue Banks • American College of Emergency Physicians • American College of Occupational and Environmental Medicine • American Health Care Association • American Hospital Association • American Medical Depot • American Nurses Association • American Osteopathic Association • American Red Cross • America's Health Insurance Plans • Amgen, Inc. • Antelope Valley Healthcare District • Archdiocese of Washington • Association of Healthcare Resource & Materials Management Professionals • Association of State Floodplain Managers • Atlantic Health Systems • Baxter Healthcare, Inc. • Baylor Health Care System • Biotechnology Industry Organization • Blue Cross and Blue Shield Association • Blue Shield California • Brooklawn Memorial Park/Johnson Memorial Medical Center

Sector	GCC Membership	SCC Membership
	• State of Oregon, Office of Emergency Management • State of Texas, Department of Health Services • USDA	• Business Continuity Consulting • Caliber Security Partners • Cardinal Health • Carolinas Regional Healthcare System • Casket and Funeral Supply Association of America • Catholic Cemetery Conference • Chicago Veterinary Medical Association • Children's Medical Center of Dallas • Cisco Systems, Inc. • Compass Rose LLC • Condition Zebra • Cook Children's Northeast Hospital • Corporate Safety, Security, and Building Services • Dartmouth Hitchcock Medical Center • DaVita Healthcare Partners • Dayton Fire Department (Ohio) • Divergent Group, LLC • Dodge Company • Emergent BioSolutions • Excela Health System • Flattery Touch Healthcare Consulting • Gamxing, Inc. • Generic Pharmaceutical Association • George Washington University Medical Center • Global Institute for Cybersecurity and Research • Greater New York Hospital Association • Group Health Cooperative • Health Industry Distributors Association • Health Promotion Consultants • Healthcare Distribution Management Association • Healthcare Information and Management Systems Society • Healthcare Quality Management AETNA • Healthcare Ready • Henry Ford Health System • Henry Schein • Highmark Health Services • HITRUST • Hofstra North Shore-LIJ School of Medicine • Horan & McConaty Funeral Services • Horizon Blue Cross Blue Shield of New Jersey • Hospital Association of Southern California • Hospital Corporation of America • HSS Inc. • Humana • Infragard EMP SIG • Inova Health System • Institute for CI Technology • International Association for Healthcare Security and Safety • International Cemetery, Cremation and Funeral Association

Sector	GCC Membership	SCC Membership
		• IP Services • James B. Haggin Memorial Hospital • Johns Hopkins University • Joint Commission, The • Kaiser Permanente • Kaleida Health • Kidney Community Emergency Response Coalition • Knowledge Center Enterprises, LLC • Laboratory Corporation • LaFayette General Medical Center • Mary Washington Healthcare • Matthews Cremation • Mayo Clinic • McAfee • Medco Health Solutions, Inc. • Medline Industries, Inc • Medtronic • Medxcel • Memorial Sloan Kettering Cancer Center • Merck & Co., Inc. • Monmouth Ocean Hospital Service Corporation • Mount Sinai & Schwab Rehabilitation Hospitals • Nashville Supply Chain Services • National Association of Chain Drug Stores • National Association of Psychiatric Health Systems • National Funeral Directors Association • National Funeral Directors & Morticians Association • National Health Information Sharing and Analysis Center • Nemours Foundation, The • Nevada Hospital Association • New Jersey Hospital Association • Nova Southeastern University • Orlando Health • Palmetto Health Tuomey • Pfizer • Purdue Pharma Technologies • Reclamere, Inc. • Roswell Park Cancer Institute • Saint Louis University Hospital • Samaritan Health Services • Sempermed USA, Inc. • Siemens Healthcare USA • SMA Technology Group • Southern California Orthopedic Institute • Spectrum Healthcare Resources • St. Luke's Health System • Stanford Health Care/Stanford Children's Health • Stanley Funeral Homes • Strategic Marketplace Initiative • Tauri Group • Technology Partners, Inc. • Tenet Healthcare Corporation

Sector	GCC Membership	SCC Membership
		• Texas A&M Health Science Center • Texas A&M University • Texas Biomedical Research Institute • Tronex International Incorporated • UAB Health Systems • United Healthcare • UnitedHealth Group • University of California Los Angeles Medical Center Occupational Health Facility • University of Medicine and Dentistry, New Jersey • University of South Alabama • University of Texas, MD Anderson Cancer Center • University of Texas Medical Branch at Galveston • University of Washington Medicine • Valley Health System • Van Scoyoc Associates • Verizon • Virginia Commonwealth University Health System • Virginia Hospital and Healthcare Association • Walgreens • Washington Occupational Health Associates, Inc. • WellPoint, Inc. • Zenith American Solutions
Information Technology	• DHS • DOC • DOD • DOE • DOI • DOJ • DOS • GSA IT • NIST • Office of Management and Budget • NTIA	• ACT-The App Association • Adobe Systems • Advanced Micro Devices (AMD) • Afilias USA, Inc. • Araxid • Arbor Networks • Aveshka • Bell Canada • Biofarma • Bivio Networks • Blackberry • Business Software Alliance • CA Technologies • Center for Internet Security • Certichron, Inc. • Cisco Systems, Inc. • Coalfire Systems, Inc. • Computer and Communications Industry Association • Computer Sciences Corporation • Computing Technology Industry Association • Core Security Technologies • Cyber Pack Ventures, Inc. • Dell Inc. • Deloitte & Touche LLP • Dunrath Capital • Dynetics, Inc.

Sector	GCC Membership	SCC Membership
		• eBay, Inc. • Echelon One • e-Management • EMC Corporation • Entrust, Inc. • Equifax, Inc. • EWA Information & Infrastructure Technologies, Inc. • Exelis, Inc. • FireEye, Inc. • Google • Green Hills Software • Hatha Systems • Hewlett Packard • IBM Corporation • Information Technology Industry Council • Information Technology – Information Sharing and Analysis Center • Intel Corporation • Internet Security Alliance • (ISC)2 • ITT Corporation • iWire365, Inc. • Juniper Networks • KPMG LLP • Kwictech Interactive Inc. • L-3 Communications • Lancope, Inc. • LGS Innovations • Litmus Logic, LLC • Lockheed Martin • Lumeta Corporation • Lunarline, Inc • Microsoft Corporation • Motorola • Netstar-1 Government Consulting, Inc. • NeuStar • Northrop Grumman • NTT Communications Corporation • One Enterprise Consulting Group, LLC • Palo Alto Networks • Pragmatics • Rackspace, Inc. • Raytheon Company • Reclamere • Renesys Corporation • SAFE-BioPharma Association • SafeNet Gemalto, Inc. • SAIC • Seagate Technology • SecureState, LLC • Sentar, Inc. • Serco, Inc. • SI Organization, The • Siemens Healthcare, USA • Sony • Symantec Corporation • System 1, Inc.

Sector	GCC Membership	SCC Membership
		• TASC, Inc. • Team Cymru • TechAmerica • Telecommunications Industry Association • TeleContinuity, Inc. • Terremark Worldwide, Inc. • TestPros, Inc. • Themis Computer • Triumfant • Tyco International • U.S. Internet Service Provider Association • Unisys Corporation • Vanguard Defense Industries • Vencore • VeriSign Authentication Services • Verizon • Vostrom • Xerox
Nuclear Reactors, Materials, and Waste Sector	• Conference of Radiation Control Program Directors • DHS • DOD • DOE • DOJ • DOS • DOT • EPA • HHS • NRC • Organization of Agreement States	• Dominion Generation • Exelon Generation Company, LLC • Harvard University / Boston Children's Hospital • Mallinckrodt Pharmaceuticals • Nuclear Energy Institute • Oregon State University • Reed College • Rutgers University • Security Engineering Associates • University of Missouri
Transportation Systems	• American Association of State Highway and Transportation Officials • DHS • DOC • DOD • DOE • DoED • DOJ • DOS • DOT • GSA • HHS • IACP • National Association of State Directors of Pupil Transportation • NRC • NSA • National Transportation Safety Board (NTSB) • State of Florida, Department of Energy • USDA **Aviation Mode Subsector:** • DHS • DOC • DOD • DOJ	**Aviation Mode Subsector:** • Aerospace Industries Association • Aircraft Owners and Pilots Association • Airlines for America • Airports Consultants Council • Airports Council International-North America • American Association of Airport Executives • Boeing Company, The • Cargo Airline Association • National Air Carrier Association • National Air Transportation Association • National Business Aviation Association, Inc. • Regional Airline Association **Freight Rail Mode Subsector:** • Alaska Railroad Corporation • American Short Line and Regional Railroad Association • Amtrak • Anacostia and Pacific Company, Inc. • Association of American Railroads • Burlington Northern Santa Fe Railway • Canadian National Railway Company • Canadian Pacific Railway • Capital Metro Transit

Sector	GCC Membership	SCC Membership
	• DOS • DOT • NCTC • NTSB • ODNI • USPS **Freight Rail Mode Subsector:** • DHS • DOD • DOT **Highway and Motor Carrier Mode Subsector:** • American Association of State Highway and Transportation Officials • DHS • DOC • DOD • DOE • DoED • DOJ • DOT • GSA • HHS • IACP • National Association of State Directors of Pupil Transportation • NRC • NSA • State of Florida, Department of Energy • USDA **Maritime Mode Subsector:** • DHS • DOC • DOD • DOE • DOJ • DOT **Mass Transit and Passenger Rail Mode Subsector:** • DHS • DOD • DOJ **Pipeline Mode Subsector:** • DHS • DOD • DOE • DOJ • DOT **Postal and Shipping Mode Subsector:** • DHS • DOD • DOT • HHS • USPS	• Conrail • CSX Transportation • Florida East Coast Railway • Genesee & Wyoming, Inc. • Indiana Harbor Belt Railroad • Iowa Interstate Railroad Ltd. • Kansas City Southern Railway Company • Massachusetts Bay Transportation Authority • Metra – Metropolitan Rail • Metropolitan Transportation Authority (New York) • New Jersey Transit • Norfolk Southern • Pan Am Railway • Union Pacific Railroad Company • Veolia Transportation • Virginia Railway Express • Wheeling & Lake Erie Railway **Highway and Motor Carrier Mode Subsector:** • American Bus Association • American Chemistry Council • American Logistics Aid Network • American Petroleum Institute • American Trucking Association • BusBank, The • CAT Eyes • Con-Way, Inc. • Detroit-Windsor Truck Ferry • First Student, Inc. • Greyhound • Inoventures, LLC • Institute of Makers of Explosives • Intermodal Association of North America • Kenan Advantage Group • Mid-States Express, Inc. • National Association of Pupil Transportation • National Association of Small Trucking Companies • National Association of State Directors of Pupil Transportation Services • National School Transportation Association • National Tank Truck Carriers, Inc. • Owner-Operator Independent Drivers Association • PITT Ohio Express • Schneider National • Seaton & Husk, LP • Sentinel Transportation • SLT Express • Taxicab, Limousine and Paratransit Association • Transportation Research Board • Tri-State Motor Transit Company • Truck Rental and Leasing Association

Sector	GCC Membership	SCC Membership
		• United Motorcoach Association **Maritime Mode Subsector:** • N/A **Mass Transit and Passenger Rail Mode Subsector :** • American Public Transportation Association • Amtrak • Bay Area Rapid Transit • Chicago Police Department • Chicago Transit Authority • Dallas Area Rapid Transit / Trinity Railway Express • Denver Regional Transportation District • Greater Cleveland Regional Transit Authority, The • King County Department of Transportation • Los Angeles County Metropolitan Transportation Authority • Los Angeles Sheriff's Department • Maryland Transit Administration • Massachusetts Bay Transportation Authority • Metropolitan Atlanta Rapid Transit Authority • Metropolitan Transit Authority of Harris County • Metropolitan Transportation Authority, New York • Minneapolis Metro Transit • New Jersey Transit • New York Police Department • Northeast Illinois Commuter Railroad Corporation (Metra) • Portland Police Department, Oregon • Southeastern Pennsylvania Transportation Authority • Utah Transit Authority • Washington Metropolitan Area Transit Authority **Pipeline Mode Subsector:** • American Fuel and Petrochemical Manufacturers • American Gas Association • American Petroleum Institute • Association of Oil Pipe Lines • Canadian Energy Pipeline Association • Interstate National Gas Association of America • National Fuel **Postal and Shipping Mode Subsector:** • DHL International • FedEx Corporation • United Parcel Service of America
Water and Wastewater	• Association of State Drinking Water Administrators	• Alexandria Renew Enterprises • American Water

Sector	GCC Membership	SCC Membership
	• DHS • DOD • DOI • DOJ • DOS • Environmental Council of the States • EPA • HHS • Montana Department of Environmental Quality • NACCHO • NARUC • State of New Hampshire, Department of Environmental Services • USDA	• American Water Works Association • Association of Metropolitan Water Agencies • Boston Water and Sewer Commission • Breezy Hill Water and Sewer Company • Conway County Regional W.D.D. • Davidson Water, Inc. • District of Columbia Water and Sewer Authority • National Association of Clean Water Agencies • National Association of Water Companies • National Rural Water Association • New York City Department of Environmental Protection • Onondaga County Water Authority • Orlando Utilities Commission • Prince William County Service Authority • San Jose Water Company • Spartanburg Water • Trinity River Authority of Texas • Water Environment Federation • Water Environment Research Foundation • Water Information Sharing and Analysis Center • Water Research Foundation

Appendix 3: Communications

This appendix describes how emergency communications systems and protocols will support public messaging in a long-duration power outage. While some unique messaging systems/processes for a power outage are described below as a part of the information sharing methods, most actions are consistent with Response and Recovery FIOP, ESF #2 – Communications and ESF #15 – External Affairs annexes to the NRF.

Situation

Since communications systems rely on electricity, any incident that causes long-term power outages will create a challenging environment for telecommunications and public messaging. Situational awareness will be difficult to obtain and information may change frequently before an incident stabilizes. This will complicate efforts to deploy and employ resources effectively. Local impacts will vary widely based on direct and cascading impacts to CI, the level and quality of local preparedness efforts, and the availability and capabilities of SLTT resources.

Impacts that result from a long-duration power outage will vary depending on the incident. An incident that results in physical damage to electric power infrastructure (e.g., catastrophic earthquake) will also likely damage or destroy telecommunications infrastructure and require extended federal communications support. Incidents that may not result in physical damage to communications infrastructure (e.g., some space weather) may require non-traditional response and recovery strategies that mitigate telecommunications systems degradation and public messaging when an outage lasts for a significant period.

Additionally, resources that would otherwise be available through mutual aid agreements, the Emergency Management Assistance Compact, and private sector contracts (e.g., fuel, food, and water) may not be available due to widespread impact and finite capacity. This could adversely affect communications restoration efforts and extend the need for federal support. In the event of a major communication outage resulting from power loss, the applicable state emergency communications annexes to the regional emergency communications plans developed by the FEMA Disaster Emergency Communications Division will be used to outline state capabilities, state restoration priorities, and pre-identified communications risk and interdependencies.

Finally, the loss of power will affect every other CI sector, and all of them rely on communications for response and restoration operations. Therefore, the operational communications community will actively engage non-traditional stakeholders throughout every phase of response and recovery, as well as develop and coordinate continuity of operations plans to avoid prolonging or producing more extensive, deeper, and longer-term losses post-disaster.

Concept of Support

Federal operational communications objectives are consistent with the operational communication's critical tasks from the Response FIOP:

- Ensure the capacity to communicate with both the emergency response community and the affected populations and establish interoperable voice and data communications between SLTT and federal first responders.

- Reestablish sufficient communications infrastructure within the affected areas to support ongoing life-sustaining activities, meet basic human needs, and transition to recovery.

Except where a pre-negotiated agreement exists, departments and agencies support their own personnel with organic communications assets to the greatest extent possible. National stockpiles of communications assets (e.g., radios, repeaters, smart devices) that might be available on smaller-scale disasters will likely not be available or will not be sufficient. Due to projected lack of sufficient stockpile tactical gear, prioritization should be given to recovering public networks so that all escorts have a means of coordinating federal departments and agencies. Escorts should also be prepared to deploy knowledgeable communications personnel to support their organic equipment. Incident-area technical expertise may not be available, especially in the immediate response phase.

Federal resources will be prioritized to support continuity of government and continuity of operations at all levels—required to effectively coordinate response and recovery operations—and to provide command and control connectivity to federal response teams. Continuity of government and continuity of operations support may require that federal assets be employed at local or state government leadership offices (e.g., governor's office) and EOCs when the capabilities of state or local entities are damaged, destroyed, or otherwise unusable to support this function. Federal teams engaged in incident management, lifesaving, and life-sustaining operations shall be connected into a command-and-control network(s) that enables such teams to communicate with higher, lower, and adjacent command elements.

Public Messaging

During a long-term power outage, public messaging informs all affected segments of society by providing credible messaging to expedite the delivery of emergency services and aid the public in taking protective actions.

A long-term power outage brings unique challenges for communications between government officials and the public since traditional public information and warning mechanisms rely on electricity. Communication through television, radio, email, and social media may not be possible for the majority of the public if no electricity is available to power the apparatuses used to transmit and receive this information.

In an incident that does not result in significant infrastructure damage, some methods of communication will work immediately following an incident and then degrade over time. In these cases, it is estimated that following a power loss, there will be a 4- to 8-hour window in which dissemination of information through the Emergency Alert System and the Integrated Public Alert and Warning System (IPAWS) will be most effective. After that window, communication abilities are expected to degrade, due to loss of battery power on devices such as radios and mobile phone. A typical smart device may hold a battery charge for 5 to 8 hours, though methods of recharging may be available (e.g., car battery, solar charger, and hand crank device). The rate of failure will depend heavily on local preparedness. Cellular

towers, for example, may have backup batteries or a generator backup system that could maintain power for hours to a few days.

In an incident where infrastructure damage does occur, communications may be lost immediately due to downed lines and damaged equipment. However, as the extent of damage will not be immediately clear, all available means of accessible, linguistically appropriate, and timely communications with the public should be employed.[26] Operational communications personnel will have to work closely with External Affairs, Disability Integration Advisors; system owners; ESF #2 and ESF #15 departments and agencies; SLTT emergency communications officers; and public information officers to develop the best technical strategies to communicate with the public.

The National Public Warning System (NPWS), operated by IPAWS, provides a nationwide all-hazards warning capability for the President in the event of a national catastrophic disaster. The core of the NPWS is composed of privately owned commercial and non-commercial radio broadcast stations that cooperatively participate with FEMA to provide a resilient information broadcasting capability. As denoted in Table 11, 77 stations participate in the program. Some legacy stations do not include EMP protection. Figure 9 displays the participating cities.

FEMA plans to modernize all stations with EMP protection by 2026. Known as FEMA Primary Entry Point (PEP) stations, they collectively provide coverage for approximately 90 percent of the nation's population. FEMA installed power and other resiliency features at these PEP stations and sustains the capability to support the NPWS mission. Stations outside the NPWS (more than 20,000) will need to request resources through their state emergency management channels for local broadcasting needs.

FEMA has worked with USACE to harden these stations against some threats, such as electromagnetic pulse, and equip them with backup transmitters, power generation, and fuel systems enabling broadcasting to continue for an extended period in the event of loss of a commercial power source. As fuel runs out, FEMA may also re-supply fuel to these stations to enable broadcast capabilities during a long-term power outage. State and local public safety officials can leverage the FEMA PEP station capabilities in coordination with FEMA and the owner and operators of the private sector facilities.

[26] Accessible communication means and methods for employees must be identified, planned for, and practiced to not only ensure continuity for them but for the important programs and functions they manage.

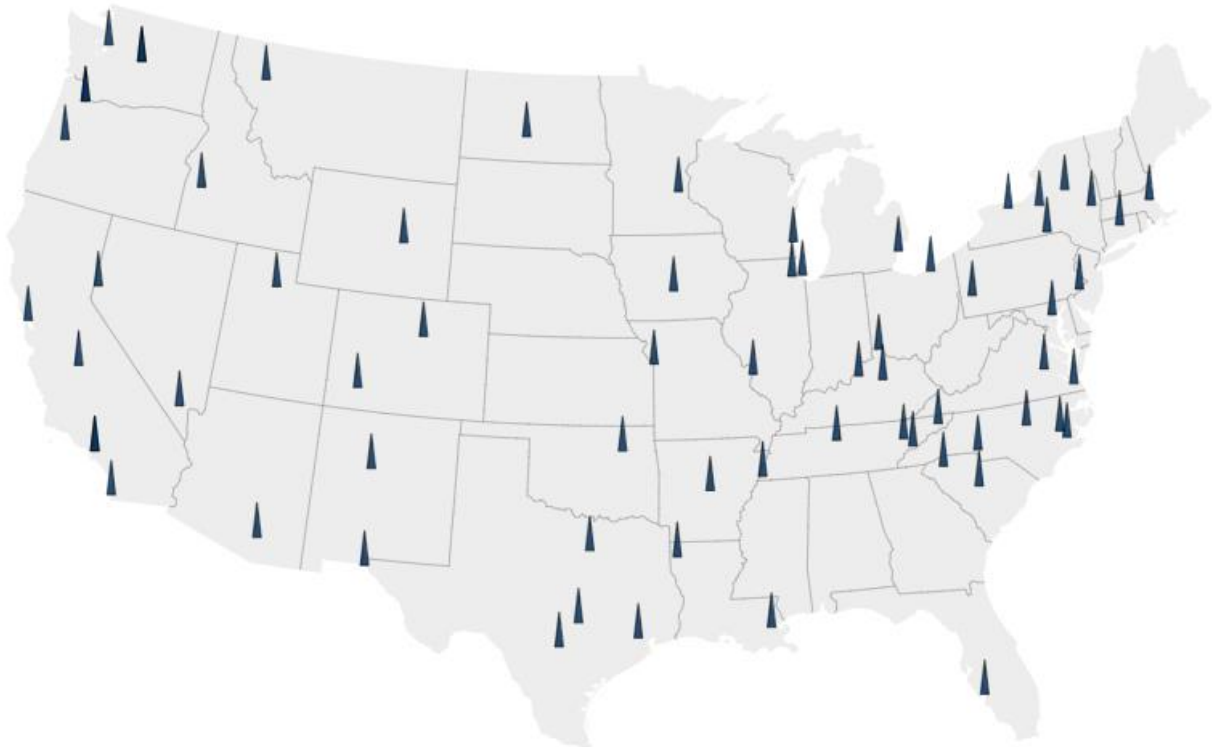

Figure 9: Footprint of PEP Radio Stations

Table 11: PEP Radio Stations by FEMA Region

Station	City	State	FEMA Region
WTIC	Hartford	CT	1
WBZ	Boston	MA	1
WGAN	Portland	ME	1
WROW	Albany	NY	2
WBNW	Endicott	NY	2
WABC	New York	NY	2
WHAM	Rochester	NY	2
WHEN	Syracuse	NY	2
WKAQ	San Juan	PR	2
WSTA	Charlotte Amalie	VI	2
XM	Washington	DC	3
NPR	Washington	DC	3
WBAL	Baltimore	MD	3
WFED	Wheaton	MD	3
WTEL	Philadelphia	PA	3
KDKA	Pittsburgh	PA	3
WTAR	Norfolk	VA	3

Station	City	State	FEMA Region
WRXL	Richmond	VA	3
WBT	Charlotte	NC	4
WSFL	New Bern	NC	4
WQDR	Raleigh	NC	4
WCOS	Columbia	SC	4
WGTK	Greenville	SC	4
WJCW	Johnson City	TN	4
WJXB	Knoxville	TN	4
WREC	Memphis	TN	4
WSM	Nashville	TN	4
WLS	Chicago	IL	5
WJR	Detroit	MI	5
WCCO	Minneapolis	MN	5
WLW	Cincinnati	OH	5
WTAM	Cleveland	OH	5
WTMJ	Milwaukee	WI	5
KAAY	Little Rock	AR	6
WWL	New Orleans	LA	6
KWKH	Shreveport	LA	6
KKOB	Albuquerque	NM	6
KRMG	Tulsa	OK	6
KLBJ	Austin	TX	6
KROD	El Paso	TX	6
WBAP	Fort Worth	TX	6
KTRH	Houston	TX	6
PREMIERE	San Antonio	TX	6
WHO	Des Moines	IA	7
WHB	Kansas City	MO	7
KMOX	St Louis	MO	7
KRVN	Lexington	NE	7
KOA	Denver	CO	8
KERR	Polson	MT	8
KFYR	Bismarck	ND	8
KSL	Salt Lake City	UT	8
KTWO	Casper	WY	8
WVUV	Fagaitua	AS	9
KFLT	Tucson	AZ	9
KMJ	Fresno	CA	9

Station	City	State	FEMA Region
KFI	Los Angeles	CA	9
PREMIERE	Los Angeles	CA	9
KOGO	San Diego	CA	9
KCBS	San Francisco	CA	9
KTWG	Agana	GU	9
KDWN	Las Vegas	NV	9
KKOH	Reno	NV	9
KFQD	Anchorage	AK	10
HEOC	Honolulu	HI	10
KBOI	Boise	ID	10
KPNW	Eugene	OR	10
KOPB	Portland	OR	10
KIRO	Seattle	WA	10

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Operational Coordination

Communications Working Group

A large-scale/long-duration power outage will likely exceed the capabilities of operational communications incident management and support as described in the Response FIOP. A Communications Working Group (CWG) may be established in the NRCC. The CWG will coordinate with resource support to help manage the national response and to recommend resource priorities. At a minimum, the CWG shall consist of representatives from the following:

- ESF #2 – Communications
- ESF #7 – Logistics
- ESF #15 – External Affairs
- FEMA Office of National Continuity Programs
- FEMA Office of the Chief Information Officer
- FEMA Office of Chief Counsel
- FEMA Disability Integration and Coordination Advisor
- American Red Cross
- American Radio Relay League
- Communications ISAC

The membership of the CWG will be flexible and scalable to involve additional stakeholders as necessary. As such, relevant non-ISAC private sector companies may be asked to participate.

The CWG is responsible for:

- Collecting, analyzing, and disseminating communications situational awareness
- Prioritizing limited resources based on national guidance

- Identifying and addressing requirements that cannot be solved at a lower level
- Developing solutions to unique stakeholder problems as they arise

National Joint Information Center

Due to the severity of this scenario and need for coordinated national messaging, a National Joint Information Center (JIC) will be established to provide unified, accessible messaging. The JIC serves as the federal incident communications coordination center and is staffed by incident communications response personnel who rapidly mobilize to coordinate the federal external communications effort. It leverages a variety of conference call mechanisms to coordinate across state, Tribal Nations, federal, and private sector entities, assuming telephone lines are operational. The Private Sector Incident Communications Conference Line (PICCL) is a standing line and distribution list, composed of private sector, CI sector, and major national association corporate communicators. The PICCL, maintained by CISA Office of External Affairs, is provided to component offices to ensure private sector communicators receive timely public information during an incident requiring a coordinated federal response. During a response in which FEMA stands up the NBEOC, NBEOC coordination calls may be initiated with private sector partners across various sectors.

An ESF #15 – External Affairs Operations Director may be delegated to lead the federal interagency team. On the other hand, since DOE is the SRMA for the energy sector, DOE and DHS may co-lead the National JIC.

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Appendix 4: Roles and Responsibilities

Given that the roles and responsibilities for restoring power, maintaining infrastructure operations, and delivering critical support resides across public, private, and community organizations, it is paramount to synchronize response and recovery concepts across public, private, and other non-government sector operations at the SLTT and federal levels.

This section provides an overview of the power-specific roles and responsibilities of the key public and private stakeholders who are involved in the implementation of the POIA. General emergency response or recovery roles and responsibilities are captured in the NRF, NDRF, and Response and Recovery FIOP.

Table 12: Private Sector Association Roles in a Long-Term Power Outage Incident

Organization	Roles in a Long-Term Power Outage Incident
American Public Power Association (APPA)	• Coordinates the restoration of power throughout the public power community. • Facilitates two-way communications with the applicable federal agencies or other trade associations. • Participates in ESCC and DOE SRMA and ESF #12 – Energy efforts.
Edison Electric Institute (EEI)	• Represents all U.S. investor-owned electric companies and coordinates with federal agencies as necessary. • For regional outage incidents, supports its members' mutual assistance efforts through Regional Mutual Assistance Groups. • Upon activation of an NRE, serves as the industry liaison to the chief executive officers of its member companies and coordinates with senior government officials and with national organizations representing state and local interests. • Serves as an industry liaison to state regulatory agencies when requested by a member. • Convenes periodic conference calls with the member company chief executive officers and with senior government officials. • Serves as the investor-owned electric company industry's primary national information resource, and provides a broad, national perspective on the event through media and public relations activities and national stakeholder outreach, including relevant federal agencies, social media support, and industry-wide communication and coordination to relevant stakeholders. • Participates in ESCC coordination among senior government and industry executives to ensure effective response, appropriate prioritization and allocation of resources, and support for deviation from standard procedures during an incident.
National Association of Regulatory Utility Commissioners (NARUC)	• During a major power outage, links the necessary agencies together for situational awareness and response coordination. • Represents electric cooperatives and coordinates with federal agencies during an outage. • Supports cooperative mutual assistance program activation and coordinates with other member trade associations of the electric utility industry.
National Association of State Energy Officials (NASEO)	• Supports the EEAC program that provides state and territorial energy emergency points of contact. • Assists DOE in facilitating communications and information sharing among impacted states when energy supply disruptions occur and with coordination calls and situational reporting by states. • Provides technical support to state agencies that have a role in energy response or restoration. • Advises states and the federal government on energy issues in general and energy emergencies.

Organization	Roles in a Long-Term Power Outage Incident
North American Electric Reliability Corporation (NERC)	• Serves as the ERO for North America, subject to oversight by the FERC and governmental authorities in Canada. NERC's jurisdiction includes users, owners, and operators of the BPS, which serves more than 334 million people. • Coordinates the E-ISAC and oversees the Bulk Power System Awareness program. **E-ISAC:** • Provides threat information, mitigation advice, and alert products to its members. • Supports the ESCC in fulfilling its role. **NERC Bulk Power System Awareness:** • Collects and analyzes information on system disturbances and other incidents that have an impact on the North American BPS, and disseminates this information to internal departments, registered entities, regional organizations, and governmental agencies as necessary. • Monitors ongoing storms, natural disasters, and geopolitical events that may potentially affect or are currently affecting the BPS.
National Rural Electric Cooperative Association (NRECA)	• If a disaster necessitates the activation of the ESCC, NRECA and the cooperative sector closely coordinate with the ESCC and local, state, and federal authorities.
Multi-State Fleet Response Working Group	• Identifies existing protocols, policies, procedures, systems, organizations, and technologies that are already in place within the government and the private sector that impact fleet movement. • Catalogs and disseminates information related to state entrance and pass-through requirements. • Conducts annual meetings and exercises between private sector and state/local government participants. • Identifies common operational impediments and gaps and recommends solutions. • Coordinates with state and local government planning and operational activities and regulatory requirements. • Promotes awareness, education, and integrated planning. • Develops products and services. • Develops recommendations to public and private sector operational leadership. • Enhances communication between public and private sector participants. • Leverages the efforts and activities of the federal government and its agencies that may play a role in this effort.

Table 13: State, Local, Tribal Government (Tribal Government), and Territorial (SLTT) Government Roles in a Long-Term Power Outage Incident

Roles and Responsibilities in a Long-Term Power Outage Incident
• Identify what may be exceptions to the normal utility prioritization process when the situation requires utilities to reprioritize based on significant consequences or cascading interdependencies resulting from some unique aspect of the event that might not have been foreseen. • Coordinate with utilities on prioritizing the restoration of power to CI and the public.

Table 14: Federal Government Roles in a Long-Term Power Outage Incident

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
Department of Agriculture (USDA)	• Provides technical support and access to damage assessments, impacts, needs, and restoration efforts for electric power generation, transmission, and distribution in Rural Development Utilities Program-financed systems. • Provides nutrition assistance to affected people through Supplemental Nutrition Assistance Program (SNAP), Disaster-SNAP, and the Women Infants and Children program.

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
	• Produces economic impact information and research on food and agriculture. • Ensures the health and well-being of livestock, wildlife, and crops. • Ensures the safety and defense of the nation's supply of meat, poultry, and processed egg products.
Department of Defense (DOD)	• DOD supports federal actions related to power outage incidents requiring temporary power restoration assistance. **Defense Logistics Agency Energy Office:** • Provides high-end generators through a memorandum of agreement between DLA and FEMA. • Bulk Petroleum Services – Provides contract support for the bulk petroleum supply chain, including worldwide acquisition of fuel-related services such as government-owned, contractor-operated defense fuel support points and contractor-owned • and -operated defense fuel support points, alongside aircraft fuel delivery, lab testing and environmental compliance, assessment, and remediation. • Direct Delivery Fuels/Commercial Specification Fuels – Provides worldwide acquisition and integrated material management of commercial fuels delivered directly to military and federal civilian customers. **U.S. Army Corps of Engineers:** • Responsible for providing temporary power to designated critical facilities. • Maintains temporary emergency power restoration resources such as USACE Emergency Power Planning and Response Teams, Advance Contracting Initiative contractors, 249th Engineer Battalion, SMEs, and the USACE Deployable Tactical Operations System for communications. • Assesses critical facilities to determine generator and other requirements for temporary emergency power. • Initiates long-term recovery efforts by assessing and coordinating the CI restoration. • Prepares, delivers, installs, and de-installs generators. • Provides operations, fueling, service, and maintenance of installed generators. • Services, maintains, and repairs generators prior to their return to long-term storage to ensure they are fully mission capable.
Department of Energy (DOE)	• Serves as the SRMA for the energy sector; the primary federal agency responsible for collaborating with the energy sector on emergency preparedness requirements. • During Stafford Act emergencies, which require coordinated federal support, directs ESF #12 activities for the energy sector. • Addresses significant disruptions in energy supplies for any reason, whether caused by physical disruption of energy transmission and distribution systems, unexpected operational failure of such systems, acts of terrorism or sabotage, or unusual economic, international, or political events. • Assesses the impact that damage to an energy system in one geographic region may have on energy supplies, systems, and components in other regions relying on the same system. • Provides information, in cooperation with SLTT officials, federal government and energy industry officials, on energy supply and demand conditions and the requirements for and availability of materials and services critical to energy supply systems (e.g., outages, restoration status, energy infrastructure status). • Serves as a federal point of contact with the energy industry for information sharing and requests for assistance from private and public sector owners and operators. • Provides technical and subject matter expertise regarding energy supplies and systems to energy asset owners and operators, other federal agencies, SLTT governments, and conducts field assessments as needed. • Exchanges information with the states during a power outage, including the scope, outages, and potential duration by county, and response and recovery efforts through the EEACs. • Coordinates and shares information with the Electricity and the Oil and Natural Gas SCCs, the ERO, and various associations that represent portions of the energy sector.

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
	• Serves as a source for reporting of critical energy infrastructure damage and operating status for the energy systems within an impacted area, as well as the impacts on regional and national energy systems. • Applies DOE's technical expertise to help ensure the security, resiliency, and survivability of key energy assets and critical energy infrastructure. **Bonneville Power Administration:** • Operates and maintains about three-fourths of the high-voltage transmission within Idaho, Oregon, Washington, western Montana, and small parts of eastern Montana, California, Nevada, Utah, and Wyoming. **Southeastern Power Administration:** • Through 23 USACE water projects, markets power to more than 491 wholesale customers in 10 southeastern states—Alabama, Florida, Georgia, southern Illinois, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia—serving over 12 million consumers. • Schedules hydropower generation at the USACE facilities within its marketing area to ensure and maintain continuity of electric service to its customers. **Southwestern Power Administration:** • Markets hydroelectric power in Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas from 24 USACE multipurpose hydroelectric facilities/dams, serving over 8 million end-use customers. • Operates and maintains 1,380 miles of high-voltage transmission lines, and owns numerous substations and switching stations, as well as a communications system to monitor and control the transmission of electricity that includes microwave, very high frequency radio, and state-of-the-art fiber optics. **Western Area Power Administration:** • Operates and maintains an extensive, integrated, and complex high-voltage power transmission system to deliver power. • Using this over-17,000-circuit-mile federal transmission system, sells and delivers reliable electric power to most of the western half of the United States BPS.
Department of Homeland Security (DHS)	• The Secretary of Homeland Security is the principal federal official for domestic incident management and is responsible for coordinating federal operations within the United States to prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies. **Federal Emergency Management Agency:** • The FEMA Administrator serves as the principal advisor to the President, the Secretary of Homeland Security, and the Homeland Security Council regarding emergency management. • Obtains the latest information on the status of the power outage from DOE, disseminates CI risk assessments to all authorized government agencies, and responds to requests for such information. • Directs power outage questions, issues, and concerns from emergency management officials to DOE. • Deploys and provides resources as appropriate to collect data for information analysis and situational awareness to support operational decisions during a power outage incident. • Acquires material and resources to support SLTT government response and recovery operations through existing contracts, and activates contracts that provide personnel, equipment, and supplies to support life-sustaining services (e.g., shelter, hydration, meals/food, emergency supplies, reunification services, durable medical equipment) resulting from a power outage. • Coordinates overall staffing of federal emergency management activities at multiagency coordination centers, including which ESFs/RSFs are activated, the size and composition of the organizational structure, the level of staffing at multiagency coordination centers, and identification of required key positions. • Provides strategic leadership to coordinate and prioritize federal resources and capabilities to areas affected by the power outage.

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
	• Develops and promulgates continuity guidance across the whole community to increase the resiliency of the nation for all threats and hazards. **National Protection and Programs Directorate:** • Leads the national effort to coordinate the overall federal effort to promote the security and resilience of the nation's critical infrastructure. **Office of Cybersecurity and Communications:** • Serves as the SRMA for the Communications and Information Technology sectors and provides national-level incident situation reporting for those sectors. • Serves as the national coordinator for ESF #2 – Communications. **Office of Emergency Communications:** • Coordinates planning for national security and emergency preparedness communications for the federal government. • Helps emergency responders and government officials continue to communicate in the event of natural disasters, acts of terrorism, or other incidents. **National Cybersecurity and Communications Integration Center:** • The operational component of CS&C and the national cyber CI center designated by the Secretary of Homeland Security; serves as a centralized location to coordinate and integrate operational elements involved in cybersecurity and communications reliance, including incident response. • Engages Cyber Incident Response Teams to assist in identification of security vulnerabilities, develop mitigation strategies, and support incident response. **Office of Infrastructure Protection:** • Serves as the national coordinator for the security and resilience of the nation's CI in accordance with the Homeland Security Act and National Security Memorandum (NSM) 22. • Maintains the NICC, the watch center CISA IP, and the CI element of the National Operations Center. • Serves as the national physical infrastructure center designated by the Secretary of Homeland Security; gathers incident information on the impact to those sectors for which CISA IP serves as SRMA to provide input for national CI situation reporting. • Serves as the SRMA for six of the critical sectors designated under NSM 22, providing guidance and support to other SRMAs, and supporting CI incident response and recovery. CISA IP may be used to facilitate public-private coordination on a sector-by-sector basis in coordination with the SRMA for that sector. • Assigns Protective Security Advisors and Regional Directors to serve as liaisons between SLTT, and federal government officials and owners and operators and as infrastructure liaisons at RRCCs and SLTT EOCs. • Assigns an Infrastructure Liaison as the principal CISA IP representative and advisor to the Unified Coordination Staff when a JFO is established. • Assesses dependencies, interdependencies, and cascading effects to recommend priorities to SLTT, to minimize cascading effects, and to support recovery and restoration efforts. • Gathers incident information on the impact to those sectors for which it serves as SRMA to provide input for national CI situation reporting. **Office of Cyber and Infrastructure Analysis (OCIA):** • Coordinates with the NICC and the NCCIC to provide infrastructure consequence analysis, decision support, and modeling capabilities to public and private sector partners. • Develops an IOC List which prioritizes CI that may need support to maximize recovery and restoration efforts. • Identifies dependencies on, interdependencies between, and cascading effects of an incident on CI. **National Coordination Center for Communications:**

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
	• Joint governmental and communications industry partnership assisting in coordination, restoration and reconstruction of National Security and Emergency Preparedness (NS/EP) communications supporting federal, SLTT, and industry needs. • Serves as the operational focal point of the Communications Information Sharing and Analysis Center (COMM-ISAC) • Identifies and assists in resolving cross-sector dependencies where communications are a limiting factor or communications requires support. • Deploys ESF #2 communications expertise to NRCC, RRCC, field offices, and EOCs as appropriate.
Department of Health and Human Services (HHS)	• Provides federal assets and capabilities to support time-sensitive, lifesaving, and life-sustaining public health and medical infrastructure as well as stabilization missions to supplement SLTT government response and recovery capabilities. • Provides augmentation support for mass care and emergency assistance services. • Provides technical assistance in the form of impact analyses and recovery planning support of public health and medical services, as well as healthcare service delivery infrastructure where appropriate. • Provides strategic leadership in coordinating care and movement of patients requiring evacuation. • Provides situational awareness regarding health and medical issues. • Provides support for long-term recovery, including collaborating with SLTT officials on prioritizing restoration of the public health and private medical and healthcare infrastructures to accelerate overall community recovery. • Coordinates linking HHS benefits programs with affected populations. • Through ESF #8 – Public Health and Medical Services, works toward mitigating issues pertaining to healthcare and public health CI, and protects the wholesomeness of food and food sources through increased monitoring.
Department of the Interior (DOI)	**Bureau of Land Management:** • Provides information on energy production and supply on federal lands. • Assesses damage to energy-related infrastructure. • Provides engineering and technical support as necessary. • Develops and maintains information on critical energy-related infrastructure on federal and tribal lands. **Bureau of Reclamation:** • Provides technical assistance for the assessment of hydroelectric facilities and reservoir water operations actions as they affect energy production. • Uses Bureau of Reclamation personnel to assist in the repair of damaged hydropower generation facilities. • Modifies operations at Bureau of Reclamation facilities to increase electrical generation to supplement losses in areas affected by the incident. • Uses hydroelectric plant internal restart.
Department of Justice (DOJ)	• Leads the law enforcement response to all terrorist acts or threats within federal criminal jurisdiction, and supplements state and local law enforcement resources in certain circumstances. • Provides public safety and security assistance to support preparedness and response priorities when needed. • Provides law enforcement support to SLTT authorities to address public safety and security concerns if requested and with the requisite authority.
Department of State (DOS)	• Acts as the formal diplomatic mechanism for communication between the U.S. government and other nations regarding the response to a domestic crisis. • Maintains the International Coordination Support Annex with U.S. interagency coordination to provide support and guidance to the U.S. government on international coordination during the incident. • Coordinates and consults with foreign governments and international organizations during the power outage to determine what, if any, international and diplomatic impacts and implications exist.

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
	• Notifies foreign governments of travel restrictions and advises American citizens, businesses, and other U.S. social/economic entities abroad of the nature and extent of the power outage in the United States and any direct effect that it might have on their safety and security. • Works with SLTT, federal, and non-government organization officials to support and facilitate liaising between foreign missions and nationals. • Coordinates non-energy federal assistance to cross-border communities impacted by the power outage. • Coordinates international offers of assistance based on needs conveyed by DHS or other federal departments and agencies, as stated in the International Assistance System, while managing and leveraging applicable bilateral and multilateral agreements and relations.
Department of Transportation (DOT)	• Actively posts information related to transportation permits, waivers, and other regulations and authorities that are applicable to a power outage on its contingency operations website. • Serves as one of four primary agencies that support USACE in the Infrastructure Systems RSF structure. • Supports communication and coordination needs relative to the overall mission of the Infrastructure Systems RSF. • Supports the Community Planning and Capacity Building and the Health and Social Services RSFs.
Environmental Protection Agency (EPA)	• Serves as the designated SRMA lead for the water sector under HSPD-7 and the NIPP. • Works with the water sector in a preparedness role to encourage water utilities to coordinate with their power utilities on a prioritization list for power restoration after an outage. • Coordinates with the water sector (drinking water and wastewater facilities), including SLTT and federal government partners and the private sector, in support of ESF #3 – Public Works and Engineering. • Coordinates with DOE and state officials to approve and issue motor vehicle fuel supply waivers under the Clean Air Act and in support of ESF #12. • Exercises enforcement discretion, as appropriate, when EPA's environmental requirements could impede emergency operations of first responders or CI. • As the coordinating agency for ESF #10 – Oil and Hazardous Materials Response, addresses the cleanup of any oil and hazardous materials releases under an ESF. #10 mission assignment or under the National Oil and Hazardous Substances Pollution Contingency Plan. It may decontaminate CI that is contaminated by oil or hazardous materials, including chemical, biological, radiological, or nuclear substances.
Federal Energy Regulatory Commission (FERC)	• Monitors and investigates significant power outages to identify causes and needed reliability improvements and to determine if reliability standards were violated. • Through emergency authority under section 1(15) of the Interstate Commerce Act, gives directions for preference or priority in transportation, embargoes, or movement of traffic whenever the commission is of the opinion that an emergency requiring immediate action exists in any section of the country. • Acts on requests to waive tariff provisions during an emergency. • Shares timely actionable information regarding grid security with appropriate key personnel of owners, operators, and users of the critical electric infrastructure. • Shares with, or receives from, any non-federal entity or the federal government a cyber threat indicator or defensive measure. • Receives prior notification of sector-specific alerts developed by the NERC-Electricity Information Sharing and Analysis Center (E-ISAC) in the event of a significant incident or threat that affects the BPS.
General Services Administration (GSA)	• Provides contract support for generators and related items, transportation services and leasing for space, as requested.
Nuclear Regulatory Commission (NRC)	• Serves as the primary agency for federal response to radiological incidents at a facility or incidents caused by material that is licensed by the NRC or an NRC

Agency	Roles and Responsibilities in a Long-Term Power Outage Incident
	Agreement State. These facilities include, but are not limited to, commercial nuclear power plants, fuel cycle facilities, DOE-owned gaseous diffusion facilities operating under NRC regulatory oversight, independent spent fuel storage installations, radiopharmaceutical manufacturers, and research reactors. • Performs an independent assessment of the incident and potential off-site consequences from FEMA disaster-initiated review and, as appropriate, provides recommendations concerning any protective measures. • Performs oversight of the licensee, to include monitoring, evaluation of protective action recommendations, advice, assistance, and, as appropriate, direction. • Dispatches, if appropriate, an NRC site team of technical experts to the licensee's facility.
Tennessee Valley Authority (TVA)	• Provides electricity for business customers and local power distributors serving 9 million people in parts of 7 southeastern states: Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia. • Assesses supply, system damage, and repair requirements within TVA. • Supplies surplus power as required to the power grid. • Supplies critical replacement parts and equipment as requested. • Supplies technical expertise as requested.

Table 15: Non-Government Organization Roles in a Long-Term Power Outage Incident

Organization	Roles and Responsibilities in a Long-Term Power Outage Incident
American Red Cross (ARC)	• Roles and responsibilities for the ARC are included in the ESF and RSF annexes and the Response and Recovery FIOP.
National Voluntary Organizations Active in Disasters (NVOAD)	• Roles and responsibilities for NVOAD are included in the ESF and RSF annexes and the Response and Recovery FIOP.

Appendix 5: Power Outage Modeling Capabilities and Tools

A variety of modeling and situational awareness tools and capabilities exist that can provide situational awareness on energy-specific functions. Some of these tools are owned and operated by SMEs in dedicated modeling centers while others are available to end users to operate on their own devices (e.g., computers, smartphones, and tablets). This appendix includes an explanation of the tools, tool management, and tool access; however, it should be noted that DOE is the source for all status and official reporting for the federal government for the energy sector.

Modeling Tools

Environment for Analysis of Geo-Located Energy Information (EAGLE-I)

EAGLE-I, developed by DOE Headquarters staff, is a web-based visualization and situational awareness system composed of numerous applications. Use of EAGLE-I is limited to federal government personnel, and while there are currently over 600 users across the federal community, some EAGLE-I data and applications can only be accessed by DOE personnel. The National Outage Map component of EAGLE-I provides federal users with accurate, timely coverage of electric customer outage information, aggregated and visualized at the county level, sourced directly from utility company websites, and refreshed every 15 minutes. (https://eagle-i.doe.gov/default.aspx)

Energy Assurance and Resiliency Standardized Services (EARSS)

The EARSS System was developed by Oak Ridge National Laboratory to disseminate the analysis of impacts of technological, man-made, and extreme weather events, such as hurricanes, wildfires, and ice storms, on energy hubs and energy delivery infrastructures. The system provides predictive and post-event impact analysis on energy infrastructure nodes and links, as well as populations at risk.

The data and analyses are available both in a visualization platform called the EARSS CONNECTOR and/or as inputs into other models or overlays for additional analyses by the user communities through a Geo server platform called the EARSS Geo Server. (https://www.ornl.gov/sites/default/files/EARSS-Operational-Document.pdf)

HHS emPOWER Mapping Tool

The HHS emPOWER Map Tool, owned by HHS, is an interactive online mapping tool that is helping community health and emergency management officials to better anticipate, plan for, and respond to the needs of at-risk individuals who rely on electricity-dependent medical and assistive equipment and devices to live independently in their homes. The map provides a monthly total of Medicare beneficiary claims for electricity-dependent equipment and devices at the national, state, territory, county, and ZIP code levels. The tools also provide near real-time National Oceanic and Atmospheric Administration (NOAA) severe weather and other natural hazard tracking services to help identify impacted areas and estimate the number of electricity-dependent individuals who may rapidly seek assistance from first

responders, hospitals, and emergency shelters if their equipment and batteries fail.

The integrated data accessible through the HHS emPOWER Map can help community organizations, including hospitals, first responders, and electric company officials, work with health officials to minimize health impacts of prolonged power outages due to storms and other disasters on vulnerable residents.

emPOWER allows emergency planners to anticipate and plan for emergency shelters that may experience greater electricity-dependent Medicare beneficiaries nearby, and it allows first responders and hospitals to better anticipate and plan for a surge in assistance calls and care demands. Local officials can also more accurately estimate transportation and evacuation assistance needs and identify areas that may require recharging stations to be prioritized for power restoration. (https://empowermap.hhs.gov) Figure 10 shows a screenshot from emPOWER.

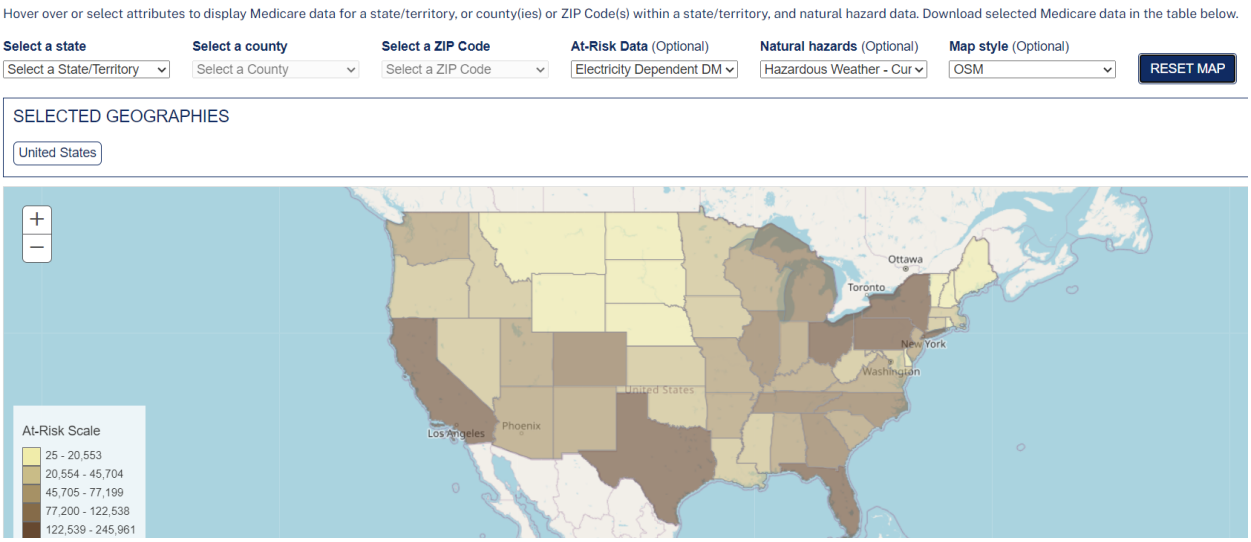

Figure 10: Screenshot from emPOWER

Emergency Power Facility Assessment Tool (EPFAT)

Following disasters that disrupt the commercial power service, generators are often required at critical public facilities such as water treatment plants, hospitals, wastewater treatment plants, and shelters. USACE assists FEMA in providing temporary emergency power at critical public facilities identified by state officials. Facility assessment data is required before a generator can be sourced and installed.

The EPFAT is a secure web-based tool used by critical public facility owners/operators or emergency response agencies to input, store, update and/or provide temporary emergency power under Stafford Act Declaration events and for local responders to provide emergency power assessment data under non-Stafford events. Having pre-installation assessment data in advance expedites USACE's abilities to provide temporary power. (https://emilms.fema.gov/IS0815/groups/53.html)

Evolutionary Prototyping with Risk Analysis and Mitigation (EPRAM)

The EPRAM electric restoration analysis model is a National Infrastructure Simulation and Analysis Center (NISAC) tool developed by Los Alamos National Laboratory. It determines the impact of network-level damage on electric power restoration by analyzing work rates and substation priorities, critical path activities, and time to restore. Model characteristics include national-scale data coverage, cellular automata technique, and simulation of work management practices used by electric companies during a variety of natural and man-made events.

EPRAM's cellular automata approach builds on geospatial representations of electric substation service areas. Service areas are initially modeled as contiguous polygons at "normal" status.

During a damage event, service areas progress from "outage" to "partially restored" to "fully restored." The model incorporates constraints such as priority scheduling of field crews, availability of spares, line switching, generator black-start options, travel time across damaged areas, and the extent of debris. EPRAM provides a variety of outputs such as charts of aggregate event (time to restoration), geospatial restoration sequences, tabular lists of critical facility impact, and work crew assignments.

Emergency Power Readiness Assessment Model (EPRAM) (USACE)

The EPRAM is a modeling tool in the USACE SimSuite web-based series of planning tools. It allows USACE to identify a specific geographical incident impact area and then query critical facilities within that area to help determine potential requirements for temporary emergency power generators. This website can only be accessed by a user who is operating on an "army.mil" IT network.

Hazards U.S. Multi-Hazard (HAZUS-MH)

HAZUS-MH is a nationally applicable standardized methodology that estimates potential losses from earthquakes, hurricane winds, and floods. FEMA developed HAZUS-MH under contract with the National Institute of Building Sciences.

HAZUS-MH uses state-of-the-art Geographic Information Systems (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of earthquakes, hurricane winds, and floods on populations. (https://www.fema.gov/hazus)

Model and Data Inventory (MoDI)

The MoDI is an interactive, web-based tool that provides an inventory of the datasets and models used across the federal interagency community to support operational decision-making. The MoDI is a product of the ESF Leadership Group (ESFLG) Modeling and Data Working Group (MDWG). The director of FEMA's Planning and Exercise Division, Response Directorate, chairs the MDWG. The ESFLG selects the members, who include SMEs, program managers, and program directors representing each of the federal ESFs.

The ESFLG MoDI contains information about individual models and datasets, including

quick summaries and detailed technical information to support both end users and technical specialists. Access and point of contact information are provided for each dataset and model, and each entry is tagged with key information about when the dataset or model is useful during emergency response and to which hazard(s), core capabilities, and support functions it applies. An interactive analysis tool allows users to explore the connections between models and datasets and how information flows between them.

Figure 11 shows a screenshot from MoDI.

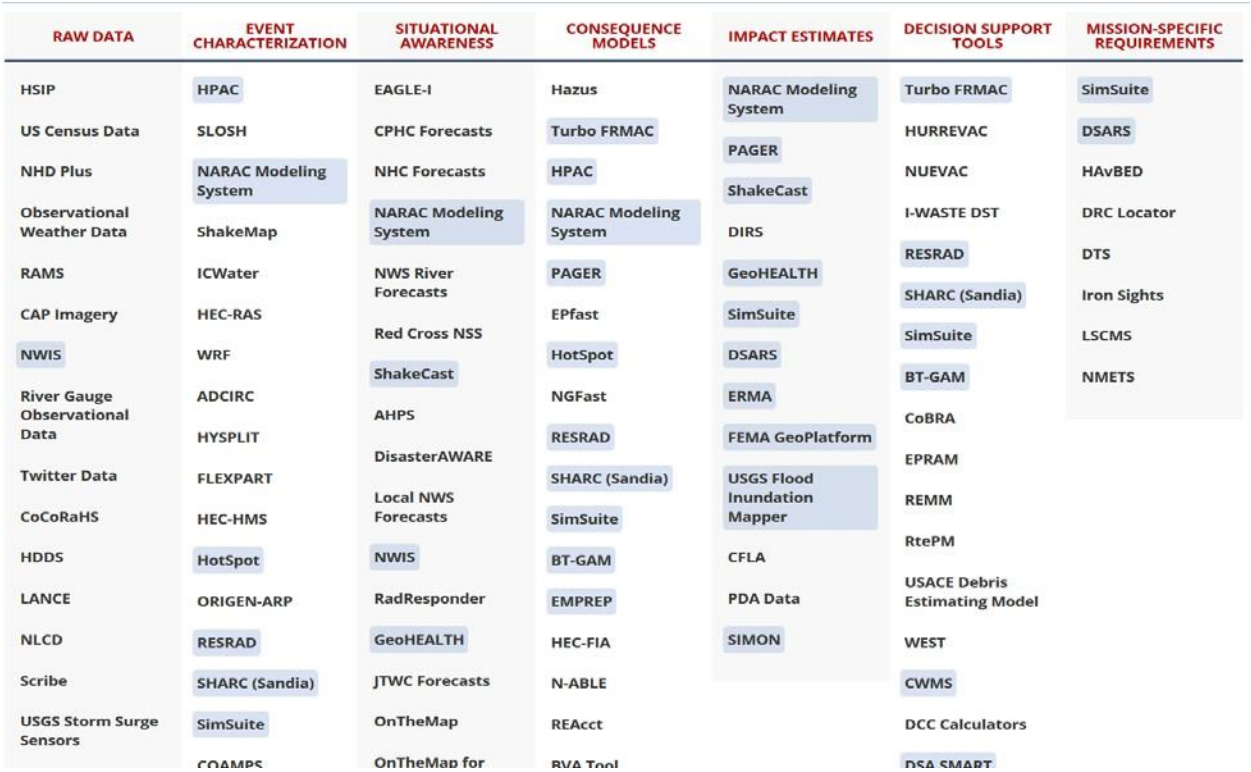

Figure 11: Screenshot from MoDI

Table 16 provides a summary of the modeling tools and their owners, availability, and method of access.

Table 16: Modeling Tools to Assist in a Power Outage Incident

Modeling Tool	Proprietary Owner/Source	Availability	Access
EAGLE-I	DOE/sourced directly from utility companies as well as DOE, federal, and private data sources	Federal employees only	Controlled by DOE: https://eagle-i.doe.gov/default.aspx
EARSS	Oakridge National Laboratory	Access from Oakridge National Laboratory required	Controlled by Oakridge National Laboratory

Modeling Tool	Proprietary Owner/Source	Availability	Access
emPOWER	HHS	Publicly available for emergency planners	Controlled by HHS: HHS emPOWER Map
EPFAT	USACE	Critical Public Facility Owners/Operators	Controlled by USACE
EPRAM	NISAC	Federal employees only	Controlled by Los Alamos National Laboratory
EPRAM	USACE	Limited to army.mil users	Controlled by USACE
HAZUS	FEMA	Publicly available through web portal	Controlled by FEMA: https://www.fema.gov/hazus
MoDI	FEMA	Analysis available for response phases (recovery underway)	Controlled by FEMA

Figure 12 shows a mapping of optimal tool usage against the incident response phases.

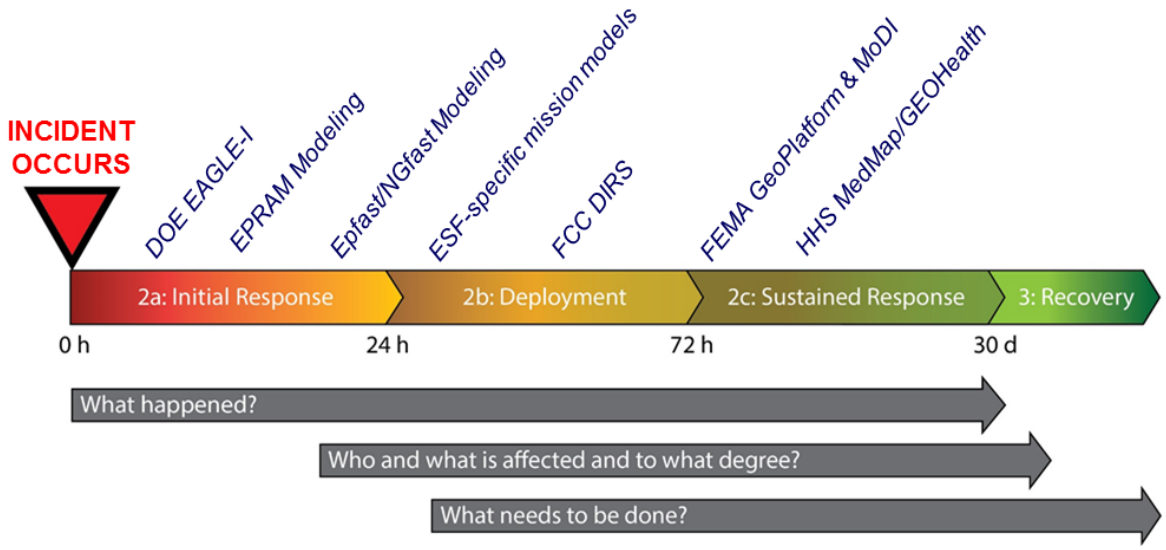

Figure 12: Power Outage Modeling Tools in the Response and Recovery Phases

Situational Awareness Reporting

Energy Assurance Daily (EAD)

The EAD, produced by DOE, provides a summary of public information concerning current energy issues. Published Monday through Friday to inform stakeholders of developments affecting energy systems, flows, and markets, it provides highlights of energy issues rather than comprehensive coverage.

The EAD addresses:

- Major energy developments

- Electricity, petroleum, and natural gas industries
- Other relevant news
- Energy prices.

The EAD is available to the public online and is posted on HSIN.

EARSS

In addition to its modeling, EARSS also provides situational awareness of various data sets required to respond to a long-term power outage.

- Monitoring capability:
  - Situational awareness of distribution outages
  - Real-time weather overlays
  - Real-time detection and notification of naturally occurring extreme events
- Energy infrastructure situational awareness:
  - Coal delivery and rail lines
  - Refinery and oil wells
  - Natural gas pipelines
  - Transportation and evacuation routes
  - Population impacts

Federal Communications Commission (FCC) Disaster Information Reporting System (DIRS)

The FCC DIRS is a voluntary, web-based system that communications companies, including wireless, wireline, broadcast, and cable providers, can use to report communications infrastructure status and situational awareness information during times of crisis. In the event of a major disaster, the FCC and CISA National Coordination Center for Communications (NCC) need accurate information regarding the status of communications services in the disaster area, particularly during restoration efforts. (http://transition.fcc.gov/pshs/services/cip/dirs/dirs.html)

Form OE-417

Through the Electric Emergency Incident and Disturbance Report (Form OE-417), information is collected on major electric system incidents and emergencies to inform DOE. Electric companies that operate as Control Area Operators and/or Reliability Authorities, as well as other electric companies as appropriate, are required to file the form whenever an electrical incident or disturbance is sufficiently large enough to cross the reporting thresholds. Reporting coverage for the Form OE-417 includes all 50 states, the District of Columbia, Puerto Rico, the USVI, and the U.S. Trust Territories. DOE uses the information to fulfill its overall national security and other energy emergency management responsibilities as well as for analytical purposes. While Form OE-417 Annual Summaries are available on the DOE website, the actual reports are protected, to the extent possible, consistent with federal law.

GeoHEALTH

GeoHEALTH (formerly MedMap) is a secure, GIS-based, electronic, interactive mapping application. This application incorporates information from numerous sources both internal and external to HHS. It includes other federal and public agencies such as NOAA and the United States Geological Survey, as well as other non-government organizations, into a single visual environment for enhanced situational awareness, assessment, and management of resources for planning and response to natural or man-made incidents.

This system supports functions such as policy analysis, planning, course of action comparison, incident management, and training. It supports the needs of decision-makers at various levels within HHS and other federal agencies to provide enhanced situational awareness at a level of granularity needed for all responders, including regional emergency coordinators and teams in the field. It also provides details on medical care sites, resources, and mobilization points and provides analytical tools for planning and preparedness efforts. During a large event such as an improvised explosive device or hurricane, there is the need to immediately determine medical care sites, resources, and mobilization points and modify information as it becomes available and changes. (http://geohealth.hhs.gov)

Outage Central

Outage Central is a portal that provides emergency response personnel with comprehensive outage links, severe weather alerts, and outage news. Operated by an independent company, it is accessible to the public, responders, and utilities. Information on outages is organized by states and regional mutual aid groups.

U.S. Electric System Operating Data Tool

Through Form EIA-930, the DOE Energy Information Administration (EIA) collects hourly forecast and actual demand data from all 66 U.S. balancing authorities operating in the lower 48 states. This data is collected 24/7/365 and made publicly available within an hour and a half of the end of the operating hour on EIA's website through the Electric System Operating Data Tool webpages.

Significant disruptions of balancing authority demand due to weather events or facility outages appear promptly in the tool. It allows users to track system recovery hourly by comparing current actual system demand with demand forecasts and historical actual demand for previous comparable periods.

Table 17 provides a summary of the situational awareness tools and their owners, availability, and method of access.

Table 17: Situational Awareness Tools to Assist in a Power Outage Incident

Situational Awareness Tool	Proprietary Owner/Source	Availability	Summary
DIRS	FCC	Voluntary Access	System for communications providers to provide operational status and restoration updates both during and after a disaster.

Situational Awareness Tool	Proprietary Owner/Source	Availability	Summary
EARSS	Oakridge National Laboratory	Access from Oakridge National Laboratory required	System for analyzing the impact of extreme weather or other events on energy hubs and energy delivery infrastructures.
Form OE-417	DOE	Schedule 1 information may be publicly released, Schedule 2 information is protected in accordance with applicable laws	The form is available on DOE public website by date and time group; however, report information is controlled by DOE. Annual report summaries are available on DOE's public website.
GeoHEALTH	HHS	Some available to the public, restricted access for others	A GIS-based, electronic, interactive mapping application hub.
Outage Central	Bluefire Studios	Available to the public	A map that tracks, records, and aggregates power outages across the United States.
U.S. Electric System Operating Data Tool	DOE/ EIA	U.S. Electric System Operating Data Tool/Form EIA-930	A centralized and comprehensive source for hourly operating data about the high-voltage bulk electric power grid in the lower 48 states.

Appendix 6: OCONUS Response

When considering the role of the POIA and managing the cascading impacts from a long-term power outage, one aspect that warrants particular attention is an OCONUS response. The past several years has seen various OCONUS crises, including the catastrophic impacts of Hurricane Maria, Typhoon Mawar, and the Maui wildfires. These experiences yielded valuable lessons that underscore the unique response challenges and critical role of preplanning. Among the challenges, two are common across FEMA's three regions with OCONUS responsibilities: the unyielding constraint of time and the limits imposed by logistical systems and shipping methods. Specific to power outages, the critical role of electrical system component compatibility and its potential to introduce significant delays in power restoration efforts cannot be overlooked. In addressing these challenges, it becomes evident that the imperative to restore power must be balanced with the broader spectrum of humanitarian needs. The specific regions that extend OCONUS, namely Region 2, Region 9, and Region 10, have their own unique operations that are tailored to their specific populations and locations. Generally, these regions have their own specific planning factors and considerations that are critical for the federal government to know prior to providing any outside assistance in the case of an incident.

Region 2 – Puerto Rico (PR) and the USVI

Critical Considerations – PR and the USVI

- PR and the USVI are vulnerable to incidents that can simultaneously impact their entire collective populations.
- Major and catastrophic disasters, that simultaneously threaten or impact PR and the USVI, may overwhelm Region 2's organic capabilities and require augmentation from FEMA Headquarters.
- The long-term lodging of federal responders is required for a large-scale incident.
- PR: Lack of common communication software platform for information exchange between local and commonwealth government
- PR: Lack of billeting for responders and survivors
- PR: Fragile infrastructure
- PR: Fiscally challenged government
- USVI: Limited infrastructure for island access (e.g., airports, seaports)
- USVI: Lack of adequate billeting for responders and survivors
- USVI: Limited storage/staging capability
- USVI: Cultural differences
- USVI: Limited Supply chain distribution assets

- USVI: Lack of skilled personnel
- USVI: Very limited access to material handling equipment
- USVI: Very limited access to trucking and transportation
- USVI: Limited communication infrastructure

Planning Assumptions – PR and the USVI

- Caribbean incidents are managed at the lowest possible organizational and jurisdictional level by the operationally viable local emergency management offices: the Puerto Rico Emergency Management Bureau's (PREMB) Zones and Virgin Islands Territorial Emergency Management Agency's (VITEMA) district offices, and the PREMB and VITEMA at the commonwealth/territorial level.
- Support from FEMA Headquarters and the NRCC is available for the movement of large-scale resources and the allocation of special federal capabilities, such as FEMA mobile communications platforms and federal search and rescue task forces.
- The federal government supports incidents in PR and the USVI with federally provided resources stationed in the Caribbean area and with pre-identified Continental United States (CONUS)-based resources.

Planning Facts – PR and the USVI

- FEMA Region 2 Caribbean area is geographically complex; it encompasses PR and the USVI and over 3.3 million residents across several islands.
- Many incidents that impact the Caribbean area also impact FEMA Region 4 or Region 6, creating a potential for resource adjudication among the regions.
- Level II response and recovery operations may involve multiple affected commonwealth and territory government entities.

Region 9 – Commonwealth of the Northern Mariana Islands, Guam, and Hawaii

The greatest challenges to disaster response in the western Pacific region are time and distance. Between the Commonwealth of the Northern Mariana Islands (CNMI) and Washington D.C., there are eight time zones and 7,800 miles over which resource movement by air must be coordinated. Support packages (federal initial response resources and commodities) may originate from or near FEMA distribution centers in Honolulu, HI; Fort Worth, TX; Atlanta, GA; or Washington, D.C. Given the time and distance to CNMI from the mainland and the limited space availability on aircraft, critical response resources "pushed" to the area must be timely and necessary or pose a risk of higher costs and increased delays for the response. For this overarching concept of operations and associated concept of support to be successful, timely activation; critical assessment of the situation; development of relevant and narrowly tailored packages of supplemental resources; integration of the private sector into response priorities, strategies, and execution; and the deployment and sustainment of resources are necessary.

Critical Considerations (general region)

- Transit time for resources to Pacific jurisdictions (days, not hours in most cases).
- PODs are still unknown in many of the jurisdictions.
- Limited land availability in Pacific restrict Forward Staging Area (FSA) size and require dual use FSA/Generator Staging Base operations.
- Pacific STT supply chains are dependent on regularly cycled and continuous maritime supply lines through fully functional ports.
- Identified resource requirements in many cases far exceed any planned for capability to date.
- Multimodal transportation needs to be exploited and further defined to include capabilities and realistic timelines.

Critical Considerations – CNMI

- CNMI has limited capability and little capacity to support large responder populations.
- Time and distance may require significant pre-impact federal support.
- There is limited communication with outer island residents.
- Federal agencies currently administer several ongoing infrastructure projects.

Critical Considerations – Hawaii

- Ninety percent of goods and 100% of fuel are imported into the state of Hawaii. Almost all commodities arrive by sea. Air cargo only accounts for approximately 1% of imported goods.
- The seaport system operates as a hub and spoke. Commodities arrive at ports on Oahu and are then delivered by barge to neighbor islands. The supply chain is long and complex, taking up to 14 days from the time goods are shipped from the mainland until they arrive on store shelves.
- In addition to the lack of local manufacturers, the state relies on a “just-in-time” logistics system for commodities, meaning direct delivery from ship to store. There is no large warehousing system that can quickly meet surges in demand for emergency supplies and other necessities. It is estimated, for example, that there is only 5 to 7 days of food supply in the state. A disruption to the supply chain would have an almost immediate impact on the population.
- The state’s seaports and airports are extremely vulnerable to damage from Hawaii’s greatest natural threats: hurricanes and tsunamis. All seaports, and all but one major airport, are in inundation areas.
- Of greatest concern is an extended closure of the Port of Honolulu, as there is not

an alternative that can rapidly be implemented to bring in sufficient commodities. The entire state would be impacted, even if no other islands sustained damage.

- Complicating the lack of in-state resources is the geographic isolation of the Hawaiian Islands. This time-distance relationship requires early identification, coordination, deployment, and tracking of resources to ensure arrival when needed. Transit time by ocean from the West Coast of CONUS requires 5 to 8 days by commercial cargo vessel and about 5 hours by commercial flight.

- Extended power, water, and communications disruptions are possible following a major natural disaster, given the location of many critical infrastructure sites along coastlines and within inundations zones. In addition, the state lacks redundant infrastructure and points of failure exist at critical facilities.

- Recovery of critical infrastructure may be challenged by lack of repair components and heavy equipment needed for debris removal and restoration. Repair components that would be required to restore infrastructure are not warehoused in the state and estimates for getting some components to the state post-event is up to 9 weeks.

Planning Assumptions – Hawaii

- If the resource needs of an incident exceed state and county capabilities, federal assistance may become available for disaster response and recovery operations under the provisions of the Stafford Act, Public Law 93-288, as amended.

- Incidents in Hawaii may occur simultaneously to events on the U.S. mainland, constraining resources available and slowing or reducing the amount of outside assistance available to support the state.

- Closure or reduced operations at seaports will result in almost immediate shortages of critical commodities. Response resources coming from the West Coast of CONUS by ship will take 5 to 8 days to just arrive at the Port of Honolulu.

Region 10 – Alaska

Region 10 is unique in the sense that although Alaska is OCONUS, it is not an island. However, this region does still require specific considerations to aid in a response. Alaska has mechanisms that help the state remain fairly self-sufficient in the event of an incident since the general assumption is that outside assistance could take a significant amount of time and travel a great distance, particularly if the weather is not favorable.

Critical Considerations – Alaska

- Alaska does not border any U.S. state.

- The Alaska Highway is the only road connecting Alaska with CONUS that is maintained year-round; all ground transport to Alaska must go through Canada.

- It is 360 miles between Anchorage and the closest metropolitan area, Fairbanks.

- Over half of the state's population lives or works in the greater Anchorage area.
- Nearly all in-state response capabilities, as well as responders themselves, work or live in the impact area.
- There is only one road into Anchorage from the north and one road out of Anchorage to the south.
- Alaska has no rail connection with the Lower 48.
- Anchorage is approximately 4 days' sailing time from Seattle, the nearest U.S. port.
- Most consumer goods for Alaskans come through the Port of Alaska (POA); damage to Anchorage will impact the whole state.
- Rural Alaskans have 5 to 7 days' worth of perishable supplies on hand; urban Alaskans have less; low-income Alaskans may have none.
- Critical infrastructure in Alaska has many single points of failure; there is little redundancy.
- If the Trans-Alaska Pipeline System is shut down, Alaska will lose its primary source of fuel and power generation capabilities in Fairbanks will be at risk.
- Alaska experiences extreme cold weather conditions in the winter; the January record low is -39° Fahrenheit (F) for Anchorage and is -65°F for Fairbanks.
- Alaska has limited daylight hours in the winter; there are only 7.5 hours of daylight in Anchorage on the day of the earthquake for this plan's scenario.
- There is limited in-state production of food and other basic commodities.
- In the best of times, the impact area has limited resources to enable a surge in emergency response operations (e.g., limited hotel rooms and rental cars).
- Alaska's extreme winter weather will hamper the performance of both responders and their equipment.
- There is little to no infrastructure support for response operations; initially, responders must be completely self-sufficient when deployed.
- Region 10 currently has offices in the cities of Bothell and Lynnwood, WA, as well as an Alaska Area Office in Anchorage. A no-notice event will impact the ability for staff to access or travel to facilities due to infrastructure damage and increased commute times. Response coordination may therefore require support from another region or FEMA Headquarters.

Planning Assumptions – Alaska

- Federal, state, local, and private sector resources will be overwhelmed because of competing demands from federal, Tribal Nations, state, and local entities.
- All supporting agencies to ESFs will deploy to Alaska with the necessary and appropriate cold weather training and personal protective equipment.
- Reception, Staging, Onward Movement, and Integration facilities will be required within CONUS.
- The federal government will not be concurrently engaged in any other Level I disaster response.
- Federal resources from CONUS will be unable to reach the incident area until at least 72 to 96 hours post-earthquake; the initial response is local.
- Most federal resources and personnel from CONUS are not prepared to function in extreme cold weather nor in an environment without functioning utilities or available hotel rooms; they must be equipped, trained, and provided with logistics support in the Lower 48 for all sustainment needs.
- Response communications in affected areas will have limited capability; some areas will be isolated physically and/or due to lack of communications systems.
- Transportation General – All transportation modes will be severely restricted due to limitations in the operating environment (e.g., weather, limited daylight, damaged infrastructure).
- Transportation Ground – Ground access into the incident area may not be feasible for up to 72 hours due to damaged or destroyed infrastructure. Alaska Department of Transportation and Public Facilities can repair damaged roads within the impact zone within 72 hours.
- Transportation Air – Runways at Joint Base Elmendorf-Richardson will be capable of supporting heavy-lift operations (after inspection). Anchorage airports will not initially be capable of receiving aircraft.
- Transportation Maritime – The POA will suffer extensive damage; all other key ports will be non-operational. Maritime access into the incident area may not be feasible for up to 96 hours due to damaged or destroyed infrastructure.

Appendix 7: Authorities and References

Table 18: Authorities and References

Title	Date	Applicability to a Power Outage
Clean Air Act (42 United States Code [U.S.C.], Chapter 85)	1970	Section 211 (c)(4)(C) provision allows EPA (upon request from a governor) to issue waivers to motor vehicle fuel requirements to address short-term fuel supply shortages. Such waivers may also benefit first responders and emergency response equipment.
Clean Water Act (33 U.S.C.)	1972	Employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into the nation′s waterways, finance wastewater treatment facilities, and manage polluted runoff. It also gives the EPA authority to implement pollution control programs and to set wastewater standards for industry and limitations on contaminants in surface waters. Its broader goal is to help restore and maintain the chemical, biological, and physical integrity of the nation′s waters.
Critical Infrastructure Information Act of 2002 (P.L. 107-296)	2002	Establishes the Protected Critical Infrastructure Information (PCII) Program. It creates a framework that enables members of the private sector to voluntarily submit sensitive information regarding the Nation′s CI to DHS with assurance that the government will not expose sensitive or proprietary data. It also establishes the PCII Program Office within CISA.
Cybersecurity Information Sharing Act of 2015 (P.L. 114-113)	2015	Enhances the ability of federal and non-federal entities to share information about cybersecurity threats.
Defense Production Act (DPA) (50 U.S.C.)	1950	Authority to require acceptance and priority performance of contracts and orders to promote national defense, which includes emergency preparedness activities conducted pursuant to Title VI of the Stafford Act and CI protection and restoration, or to maximize domestic energy supplies. The Federal Priorities and Allocations System administers the placement of DPA priority ratings in contracts involving industrial, agricultural, health, energy, and transportation resources and services. The President delegated authority to require acceptance and priority performance of contracts or orders for these categories of resources and services to DOC, USDA, HHS, DOE, and DOT respectively. Through the placement of priority ratings in contracts, private sector contractors, subcontractors, vendors, and suppliers are required to give preferential treatment for contracts and orders. This authority can ensure timely delivery of materials and services from private businesses to restore power disruptions. Priority ratings can be placed on either government (local, state, federal) or private sector contracts. Additionally, the installation of government-owned equipment authority may expedite and prioritize restoration of both public and private power infrastructure disrupted by either natural or human-caused hazards. Voluntary agreements under DPA may facilitate cooperation among business competitors to protect or restore power systems in connection with natural disasters or acts of terrorism. Participants in a voluntary agreement are granted relief from antitrust laws.

Title	Date	Applicability to a Power Outage
DOE Organization Act (P.L. 95-91)	1977	Established by DOE. DOE has the authority to obtain current information regarding emergencies in the electric supply systems in the United States as provided by other statutes such as the Federal Energy Administration Act of 1974. DOE has established mandatory reporting requirements for electric power system incidents or possible incidents to meet DOE's national security requirements and other responsibilities.
Emergency Reconstruction of Interstate Natural Gas Facilities Under the Natural Gas Act (18 Code of Federal Regulations [CFR], Parts 153, 157, and 375)	2003	FERC regulations enable interstate natural gas pipeline companies, under emergency conditions, to replace mainline facilities using—if necessary—a route other than the existing right-of-way, and to waive the 45-day prior notice requirement and cost constraints.
Energy Policy and Conservation Act (EPCA) (P.L. 94-133)	1975	EPCA's goals are to increase energy production and supply, reduce energy demand, provide energy efficiency, and give the Executive Branch additional powers to respond to disruptions in energy supply. • Sections 151–191 authorize DOE to establish and operate the Strategic Petroleum Reserve (SPR), including the Northeast Gasoline Supply Reserve. • Section 161(h) empowers the President to draw down the SPR in circumstances other than a "severe energy supply interruption" or a need to meet U.S. obligations under international energy program. • Pursuant to section 181, the Secretary establishes and maintains the Northeast Home Heating Oil Reserve.
Energy Policy Act of 2005 (P.L. 109-58)	2005	Title XII, Electricity, Subtitle A: Reliability Standards, Section 1211: Electric Reliability Standards; Electricity Modernization Act of 2005 provides for federal jurisdiction over certain activities that are required to support reliability of the United States BPS. Title XII authorizes FERC to certify a national ERO to enforce mandatory reliability standards for the BPS. FERC oversee the ERO and approves all ERO standards. The ERO can impose penalties on a user, owner, or operator of the BPS for violations of any FERC-approved reliability standard, but such penalties are subject to FERC review and potential change.
Fixing America's Surface Transportation (FAST) Act (P.L. 114-94)	2015	• Amends Part II of the Federal Power Act by adding a new section 215(A) which authorizes the Secretary of Energy to order emergency measures to protect or restore the reliability of critical electric infrastructure or defense critical electric infrastructure upon a presidential finding of a Grid Security Emergency. • Requires DOE, FERC, and other appropriate federal agencies, to the extent practicable and consistent with their obligations, to protect classified and critical electric infrastructure information and share timely actionable information regarding grid security with appropriate key personnel of owners, operators, and users of the critical electric infrastructure.
Federal Power Act (16 U.S.C, Chapter 12)	1920	• Created the Federal Power Commission as the licensing authority for hydroelectric plants; its authority was subsequently transferred to FERC upon its creation. • The Secretary of Energy, under Section 202(c), has authority in time of war or other emergency to order temporary interconnections of facilities and generation, delivery, interchange, or transmission of electric energy that the Secretary deems necessary to meet an emergency.

Title	Date	Applicability to a Power Outage
		• Establishes the Critical Electric Infrastructure Information (CEII) program. It authorizes DOE and FERC to designate certain sensitive information provided to the federal government as CEII and protect the information from disclosure under the Freedom of Information Act.
Foreign Assistance Act (P.L. 87–195)	1961	Reorganizes the structure of U.S. foreign assistance programs, separated military from non-military aid, and creates a new agency within DOS, the United States Agency for International Development (USAID) to coordinate the U.S. government's response to disasters overseas.
Natural Gas Act (15 U.S.C., Chapter 15b)	1938	• Gives the President authority to declare a natural gas supply emergency. • Allows DOE to authorize imports and exports of natural gas. Provides FERC the authority to approve the siting of and abandonment of interstate natural gas facilities, including pipelines, storage, and liquefied natural gas facilities. • Delegates authority over the construction, operation, and siting of facilities to the FERC. • Provides DOE with the authority to order any interstate pipeline or local distribution company served by an interstate pipeline to allocate natural gas to help meet the needs of high-priority consumers during a natural gas emergency.
Power Plant and Industrial Fuel Use Act (42 U.S.C.)	1978	• Under section 404(a), gives the President authority to allocate coal (and require the transportation of coal) for use by any power plant or major fuel-burning installation during a declared severe energy supply interruption as defined by section 3(8) of EPCA, 42 U.S.C. § 6202(8). • Section 404(b) authorizes the President to prohibit the use by any power plant or major fuel-burning installation of petroleum or natural gas, or both, as a primary energy source.
Safe Drinking Water Act (SDWA) (42 U.S.C., Section 300f et seq.)	1974, amended 1986 and 1996	Protects the quality of public drinking water supplies in the United States. Under the SDWA, EPA sets standards and treatment requirements for public water supplies. Regulations are in place for constituents that may pose health risks and that are likely to be present in public water supplies (microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, and radionuclides). After a power outage, water pressure fluctuation in the distribution system and/or loss of power at the treatment plant may increase contaminant intrusion or risk of compromised water quality. SDWA requirements require compliance monitoring to assure water quality meets safe drinking water standards.

Table 19: Applicable FERC Orders

Title	Date	Applicability to a Power Outage
Certifying NERC as the ERO (Docket No. RR06-1-000)	July 20, 2006	Pursuant to Energy Policy Act of 2005, FERC conditionally certified the NERC as the nation's ERO. • NERC must make specified changes and file them with FERC to continue as the ERO. • Develops and enforces mandatory electric reliability standards under FERC's oversight. The standards will apply to all users, owners, and operators of the BPS.
Order on Application for Blanket Authorization for Transfers of	September 22, 2006	The FERC Commission approved EEI to expand membership of the Spare Transformer Sharing Agreement that provides a blanket authorization for any jurisdictional public utility party to the

Title	Date	Applicability to a Power Outage
Jurisdictional Facilities and Petition for Declaratory Order (Docket Nos. EC06-140-000, EL06-86-000)		Agreement to engage in future transfers of transformers pursuant to the Agreement, including transfers of transformers by public utilities to their affiliates.
Mandatory Reliability Standards for Critical Infrastructure Protection (CIP) (Docket No. RM06-22-000)	January 18, 2008	Pursuant to Section 215 of the Federal Power Act, FERC approved eight CIP Reliability Standards submitted by NERC. The standards require certain users, owners, and operators of the BPS to comply with specific requirements to safeguard critical cyber assets.
Approving Revised Reliability Standards for CIP and Requiring Compliance Filing (Docket No. RD09-7-000)	September 30, 2009	FERC approved the CIP Reliability Standards in Order No. 706 and directed NERC to develop modifications to the CIP Reliability Standards to address specific concerns. The order in Docket No. RD09-7-000 approves version 2 of the CIP standards by: (1) removing the "reasonable business judgment" language from each of the Standards; (2) removing the "acceptance of risk" exceptions from each of the Standards; (3) adding specific conditions that a Responsible Entity must satisfy to invoke the technical feasibility exception; and (4) adding review and oversight regarding creating a risk-based assessment methodology for critical cyber asset identification in CIP-002-1.
Order No. 761, Final Rule Approving Version 4 Critical Infrastructure Protection Reliability Standards (Docket No. RM11-11-000)	April 19, 2012	FERC approved eight modified CIP Reliability Standards, CIP-002-4 through CIP-009-4, developed and submitted by NERC. • The CIP Reliability Standards provide a cybersecurity framework to identify and protect "Critical Cyber Assets" to support the reliable operation of the BPS. • Reliability Standard CIP-002-4 requires the identification and documentation of Critical Cyber Assets associated with "Critical Assets" that support the reliable operation of the BPS and introduces "bright line" criteria for the identification of Critical Assets.
Order No. 791, Final Rule Approving Version 5 Critical Infrastructure Protection Reliability Standards (Docket No. RM13-5-000)	November 22, 2013	FERC approved the Version 5 CIP Reliability Standards, CIP-002-5 through CIP-011-1, submitted by NERC. • The CIP Version 5 Standards adopt new cybersecurity controls and extend the scope of the systems that are protected by the CIP Reliability Standards.
Order No. 802, Final Rule Approving Physical Security Reliability Standard (Docket No. RM14-15-000)	November 20, 2014	FERC directed NERC to submit one or more Reliability Standards that require certain registered entities to take steps, or demonstrate that they have taken steps, to address physical security risks and vulnerabilities related to the reliable operation of the BPS. These steps require owners or operators of the BPS, as appropriate, to identify facilities on the BPS that are critical to its reliable operation. The owners or operators of those critical facilities should develop, validate, and implement plans to protect against physical attacks that may compromise the operability or recovery of such facilities.
Order No. 822, Final Rule Approving Revised Critical Infrastructure Protection Reliability Standards (Docket No. RM15-14-000)	January 21, 2016	FERC approved seven CIP Reliability Standards: CIP-003-6 (Security Management Controls), CIP-004-6 (Personnel and Training), CIP-006-6 (Physical Security of BES Cyber Systems), CIP-007-6 (Systems Security Management), CIP-009-6 (Recovery Plans for BES Cyber Systems), CIP-010-2 (Configuration Change Management and Vulnerability Assessments), and CIP-011-2 (Information Protection).
Order No. 829, Order Directing NERC to	July 21, 2016	FERC directed NERC to develop a new or modified reliability standard to address supply chain risk management for industrial

Title	Date	Applicability to a Power Outage
Develop Revised Critical Infrastructure Protection Reliability Standard that Addresses Supply Chain Risk Management (Docket No. RM15-14-002)		control system hardware, software, and computing and networking services associated with BES operations. The new or modified reliability standard is intended to mitigate the risk of a cybersecurity incident affecting the reliable operation of the BPS.

Table 20: Executive Orders and Presidential Directives

Title	Date	Description
Executive Order (E.O.) 12038, Relating to Certain Functions Transferred to the Secretary of Energy by the DOE Organization Act	February 3, 1978	Authorizes the Secretary of Energy to issue presidential permits for the construction, operation, maintenance, and connection of electric transmission facilities at U.S. international borders if it determines that the issuance of such a permit is in the public interest.
E.O. 13636, Improving Critical Infrastructure Cybersecurity	February 12, 2013	Directs the Executive Branch to: • Develop a technology-neutral voluntary cybersecurity framework. • Promote and incentivize the adoption of cybersecurity practices. • Increase the volume, timeliness, and quality of cyber threat information sharing. • Incorporate strong privacy and civil liberties protections into every initiative to secure the cybersecurity infrastructure. • Explore the use of existing regulation to promote cybersecurity.
PPD-41, United States Cyber Incident Coordination	July 26, 2016	Sets forth principles governing the federal government's response to any cyber incident, whether involving government or private sector entities. For significant cyber incidents, this PPD also establishes lead federal agencies and an architecture for coordinating the broader federal government response.
NSM- 22, Critical Infrastructure Security and Resilience	April 30, 2024	Builds upon the roles and responsibilities across the Federal Government and establishes a more effective partnership with CI owners and operators and SLTT entities to enhance CI's security and resilience. Replaces PPD 21, Critical Infrastructure Security and Resilience.

Table 21: Waivers and Other Regulatory Relief

Core Capability(s)	Lead Agency and Description
Economic Recovery	**FERC:** • During an emergency, FERC may consider waiving tariff provisions that may interfere with restoration efforts.
Environmental Response Health and Safety	**EPA:** • The Clean Air Act, Section 211 (c)(4)(C) allows EPA (upon request from the governor) to issue waivers to motor vehicle fuel requirements to address short-term fuel supply shortages. Such waivers may also benefit first responders and emergency response equipment. • In an extraordinary situation during an emergency, EPA could potentially issue a No Action Assurance that allows fuel loading and unloading without the use of vapor recovery or vapor combustion devices at bulk gasoline and marine loading terminals and associated truck racks, as otherwise required under the Clean Air Act.
Planning/Operational Coordination	**FEMA:** • During an emergency, waivers can be offered on reporting requirements, enabling

Core Capability(s)	Lead Agency and Description
	responders to focus more fully on the restoration efforts.
Critical Transportation	**DOT:** • The Federal Railroad Administration (FRA) Emergency Relief Docket (ERD) is a special provision regulation that provides expedited review and approval of waiver requests from railroads related to a specific emergency. The Administrator of the FRA can designate specific events, such as emergencies, to trigger the opening of the ERD. • Exemptions ("waivers") from many of the Federal Motor Carrier Safety Regulations occur "automatically" in accordance with 49 CFR 390.23 when the President, a governor, or local government official issues a declaration of emergency (as defined in 49 CFR 390.5). Presidential and state declarations are effective for up to 30 days, and local declarations are effective for up to 5 days. Only a Federal Motor Carrier Safety Administration Field Administrator or Regional Field Administrator has authority to extend the waivers beyond the initial 30 days and to place additional restrictions on the waivers. The waivers apply to any commercial motor vehicle responding from anywhere in the United States to provide direct relief to the emergency. • The Hours of Service limitations do not apply to a driver of a utility service vehicle as defined in 49 CFR § 395.2. • The federal government does not issue permits for oversize or overweight vehicles. State DOTs may grant these permits. To obtain state permits, travelers need to contact the state(s) in which they need to travel. For more information see the following link: http://ops.fhwa.dot.gov/freight/sw/permit_report/index.htm. • The federal government does not issue toll waivers. Toll waivers may be issued on a case-by-case basis by the state, local authority, or private entity that owns the specific piece of tolled infrastructure.
Mass Care	**FEMA:** • Issues waivers of the GSA lodging rate used to determine allowable room night charges for survivors in the TSA program.

Appendix 8: Acronyms

To promote readability, this annex utilizes acronyms only after the first occurrence of the proper name of a Federal Executive Branch department or agency or of a commonly used term. The exception to this rule applies to acronyms that only appear within tables and figures in the document, where space considerations and readability render the use of acronyms optimal.

APPA	American Public Power Association
ARC	American Red Cross
ASPR	DHS Office of the Assistant Secretary of Preparedness and Response
BPA	Bonneville Power Administration
BES	Bulk Electrical System
BPS	Bulk Power System
CAT	Crisis Action Team
CEII	Critical Electric Infrastructure Information
CFR	Code of Federal Regulations
CI	Critical Infrastructure
CI-CAT	Critical Infrastructure–Crisis Action Team
CIP	Critical Infrastructure Protection
CIR	Critical Information Requirement
Co-ops	Cooperatives
CS&C	Office of Cybersecurity and Communications
CWG	Communications Working Group
DCISE	Defense Inclusive Base Collaborative Information Sharing Environment
DHS NPPD IP	Department of Homeland Security National Protection and Programs Directorate Infrastructure Protection
DHS	Department of Homeland Security
DIB	Defense Industrial Base
DIRS	Disaster Information Reporting System
DLA	Defense Logistics Agency
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DoED	Department of Education
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation

DPA	Defense Production Act
DRF	Disaster Relief Fund
E-ISAC	Electricity Information Sharing and Analysis Center
EAD	Energy Assurance Daily
EAGLE-I	Environment for Analysis of Geo-Located Energy Information
EEAC	Energy Emergency Assurance Coordinators
EARSS	Energy Awareness and Resiliency Standardized Services
EEI	Edison Electric Institute
EIA	Energy Information Administration
EIDL	Economic Injury Disaster Loans
EMP	Electromagnetic pulse
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
EPFAT	Emergency Power Facility Assessment Tool
EPRAM	Emergency Power Readiness Assessment Model
ERD	Emergency Relief Docket
ERO	Electric Reliability Organization
ESCC	Electricity Subsector Coordinating Council
ESF	Emergency Support Function
ESFLG	Emergency Support Function Leadership Group
FAST	Fixing America’s Surface Transportation
FBI	Federal Bureau of Investigation
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIOP	Federal Interagency Operational Plan
FMCSA	Federal Motor Carrier Safety Administration
FRB	Federal Reserve Board
FRCC	Florida Reliability Coordinating Council
FRA	Federal Railroad Administration
FUA	Fuel Use Act
GCC	Government Coordinating Council
GIS	Geographic Information Systems
GSA	General Services Administration
HAZUS	Hazards U.S.
HHS	Department of Health and Human Services
HSIN	Homeland Security Information Network
HSPD	Homeland Security Presidential Directive

IACP	International Association of Chiefs of Police
IOC	Infrastructure of Concern
IOU	Investor-Owned Utilities
IP	Office of Infrastructure Protection (DHS)
IPAWS	Integrated Public Alert and Warning System
ISAC	Information Sharing Analysis Center
IT	Information Technology
JFO	Joint Field Office
JIC	Joint Information Center
JOC	Joint Operations Center
LPT	Large Power Transformer
MAWG	Mutual Aid Working Group
MDWG	Modeling and Data Working Group
MoDI	Modeling and Data Inventory
MRO	Midwest Reliability Organization
NACCHO	National Association of County and City Health Officials
NBEOC	National Business Emergency Operations Center
NASEO	National Association of State Energy Officials
NARUC	National Association of Regulatory Utility Commissioners
NCC	National Coordination Center
NCCIC	National Cybersecurity and Communications Integration Center
NCTC	National Counterterrorism Center
NDRF	National Disaster Recovery Framework
NEF	National Essential Functions
NERC	North American Electric Reliability Corporation
NGO	Nongovernmental Organization
NICC	National Infrastructure Coordinating Center
NIMS	National Incident Management System
NIPP	National Infrastructure Protection Plan
NISAC	National Infrastructure Simulation and Analysis Center
NIST	National Institute of Standards and Technology
NMART	Edison Electrical Institute's National Mutual Assistance Resource Team
NPPD	National Protection and Programs Directorate
NPCC	Northeast Power Coordinating Council
NOAA	National Oceanic and Atmospheric Administration
NPWS	National Public Warning System
NRC	United States Nuclear Regulatory Commission
NRCC	National Response Coordination Center
NRCS	National Response Coordination Staff

NRE	National Response Event
NRECA	National Rural Electric Cooperative Association
NRF	National Response Framework
NSA	National Sheriffs' Association
NSM	National Security Memorandum
NTSB	National Transportation Safety Board
NVOAD	National Voluntary Organizations Active in Disaster
ODNI	Office of the Director of National Intelligence
OCIA	Office of Cyber and Infrastructure Analysis
OPM	Office of Personnel Management
PCII	Protected Critical Infrastructure Information
PEP	Primary Entry Point
PICCL	Private Sector Incident Communications Conference Line
PMA	Power Marketing Administration
POD	Point of Distribution
POIA	Power Outage Incident Annex
PPD	Presidential Policy Directive
PSA	Protective Security Advisor
RFI	Request for Information
RFC	Reliability First Corporation
RMAG	Regional Mutual Assistance Group
RRCC	Regional Response Coordination Center
RSF	Recovery Support Function
SBA	Small Business Administration
SCADA	Supervisory Control and Data Acquisition Systems
SCC	Sector Coordinating Council
SDWA	Safe Drinking Water Act
SEC	Securities and Exchange Commission
SEPA	Southeastern Power Administration
SERC	SERC Reliability Corporation
SME	Subject Matter Expert
SRMA	Sector Risk Management Agency
SNAP	Supplemental Nutrition Assistance Program
SPR	Strategic Petroleum Reserve
SPP	Southwest Power Pool, RE
STEP	Spare Transformer Equipment Program
SWPA	Southwestern Power Administration
TRE	Texas Reliability Entity
TREAS	Department of the Treasury

TSA	Transportation Security Administration
TVA	Tennessee Valley Authority
UCG	Unified Coordination Group
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USPS	United States Postal Service
WAPA	Western Area Power Administration
WECC	Western Electricity Coordinating Council

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