



Alaska State Energy Security Plan

→ Third Advisory Group Meeting

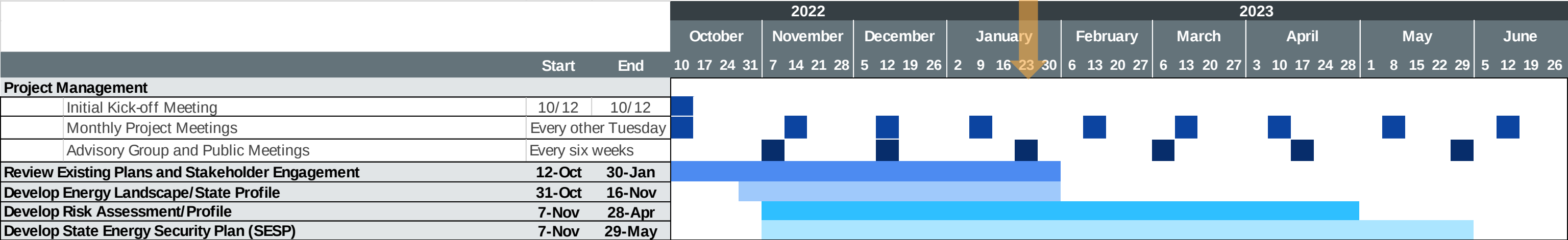
January 24, 2023



State Energy Security Plan Progress

Timeline

We are here



State Energy Security Plan Progress

- **Energy Landscape and Risk Profiles**

- ★ Summary of Electricity, Liquid Fuel, and Natural Gas Energy Systems in the State
- ★ Threats to Energy Infrastructure
 - Risk Assessment

★ Section in draft final status

★ Work on section underway

- **Energy Security and Emergency Response Authorities**

- ★ Key State Authorities and Statutes

- **Energy Security Planning and Preparedness**

- ★ State Energy Office Roles and Responsibilities
- ★ Other State Agency Roles and Responsibilities
- ★ Other Stakeholder Roles
- ★ Regional Coordination

- **Energy Emergency Response**

- ★ Operational Playbook of state response actions during:
 - ★ Power outages/electricity events
 - Liquid fuel events
 - Natural gas events

- **Energy Resiliency and Hazard Mitigation**



➔ Introduction to the Emergency Response Playbook and Stakeholder Matrices





DOE Energy Response Playbook for States and Territories

- Concept and background materials developed by the U.S. Department of Energy Office of Cybersecurity, Energy Security, and Emergency Response in collaboration with the National Association of State Energy Officials
 - Playbook guidance is available on [DOE's website](#)
- Designed to be edited and included in SESP
- Details concrete actions stakeholders take during events of differing severity

Source: Energy Emergency Response Playbook, Alaska State Hazard Mitigation Plan (SHMP), State of Alaska Energy Sector Risk Profile



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Goal Outcomes for Response Playbook

- **Documenting who does what in an emergency**, for use in training new staff, etc.
- **Identifying operational gaps in response activities**
- **Identifying additional monitoring tools and resources needed** to support work
- **Creating resource to be taken “off the shelf” during events to guide response**
- **Ultimately: Directing money toward resilience activities**
 - Based on most vulnerable infrastructure, events of highest concern, and locations in greatest need of support

Playbook Components

- **Information-Gathering/Situational Awareness:** a list of informational resources for monitoring energy supply, inventories, and markets, as well as weather-related threats
- **Consequence Assessment:** guidance for categorizing and assessing the consequence of an event to inform a proportional response
- **Response Actions:** response measures by the event type, actor, event consequence, and the time phase of the emergency event

Focusing here today

12 Matrices

▪ Individual matrices for:

1. Electricity events
2. Natural gas events
3. Liquid fuels events

1. ESF-12 (State Energy Office, etc.)
2. Emergency Management
3. Other State Government: Governor's Office, Other Agencies
4. Utilities/Industry

3 energy sectors

x

4 major stakeholder categories

12 separate matrices

Response Tiers

- **Default DOE Playbook incorporates three tiers of response for each energy event type:**
 - Tier 3: Enhanced Watch
 - Tier 2: Significant Event
 - Tier 1: Major Event
- **ICF is in the process of aligning these tiers with Alaska-specific events and established response procedures in the state.**
- **The following three slides show the three example tiers of response for electricity, fuels and natural gas.**

Electricity Events

Tier	Consequences Indicators	Examples
Tier 3: Enhanced Watch	• Service Disruption: Localized power outages with short (less than 48 hours) restoration timelines • Restoration work largely involves repairing fallen or damaged distribution lines and poles. • Lifeline sectors largely maintained with backup generators.	• Common thunderstorms • Common winter and ice storms • Public Safety Power Shutoffs (PSPS) to prevent wildfires
	• Electricity Shortage: Imbalance between supply and demand and elevated prices in some load areas. Grid operators issue lower-level communications (e.g., operating condition notices, conservation alerts, control room advisories)	• Heat waves or cold snaps that drive high electricity demands
Tier 2: Significant Event	• Service Disruption: Widespread power outages with longer (more than 48 hours) restoration timelines. • Restoration work involves repairing damaged utility wires and structures across T&D systems. • Lifeline sectors experience temporary or intermittent disruptions as backup generator fuel is exhausted and awaits replenishment. • Vulnerable groups that rely on electricity moved to shelters or provided backup generators as needed.	• Hurricane Dorian (2019) • Puerto Rico Magnitude 6.4 earthquake (2020) • Dixie Fire in California (2021)
	• Electricity Shortage: Grid operators issue emergency alerts for critical conservation and to maximize generation and transmission resource availability. Sharp price spikes across balancing areas.	• California drought and hydroelectric shortfall (2021)
Tier 1: Major Event	• Service Disruption: Widespread power outages with extended or indefinite restoration timelines (a week or longer). • Extensive damage to T&D systems, including damage to substations and other system components that require longer repairs. • Lifeline sectors, including Emergency Response, experience severe impacts from difficulty refueling vehicles and backup generators due to impact of power outages on liquid fuels supply chains.	• Hurricane Sandy (2012) • Hurricane Maria (2017) • Hurricane Laura (2020) • Hurricane Ida (2021)
	• Electricity Shortage: Grid operators initiate rolling blackouts to preserve grid stability. Typically associated with large-scale loss of generation resources due to power plant operational outages or power plant fuel shortages.	• Texas extreme cold weather event (2021)

Liquid Fuel Events

Tier	Consequence Indicators	Examples
Tier 3: Enhanced Watch	• Sporadic fuel outages and delivery delays impacting end users (e.g., gas stations, heating customers) as supply and distribution infrastructure struggles to keep up with sudden spike in demands. • Localized supply shortages at bulk terminals. Distributors begin loading trucks at terminals further away to meet customer needs. • Local or regional fuel inventories fall near or below the bottom of previous five-year range. • Elevated price spreads versus U.S. benchmarks may indicate local or regional issues.	• Localized shortages for heating oil and propane in the Midwest and Northeast during the winter months
Tier 2: Significant Event	• Widespread run-outs and/or delivery delays for end users over a period of several days to weeks. • Widespread supply shortages at bulk terminals as suppliers cannot meet all demands. Typically associated with extended outage of one or more critical supply assets. • Sharp declines in local or regional fuel inventories to well below previous five-year lows. • Sharp price spreads versus U.S. or international benchmarks may indicate significant regional issues.	• Midwest propane shortage (2014) • Hurricane Irma evacuation (2017) • Colonial Pipeline cyberattack (2021)
Tier 1: Major Event	• Fuel unavailable or inaccessible to most end users as widespread power outage or other common event renders retail outlets and critical supply infrastructure inoperable. • Lifeline sectors, including Emergency Response, have difficulty finding supply, impacting provision of essential services. • Vulnerable groups that rely on propane/heating oil moved to shelters.	• Hurricane Sandy (2012) • Hurricane Maria (2017)

Natural Gas Events

Tier	Consequence Indicators	Examples
Tier 3: Enhanced Watch	- Major transmission pipeline issues Operational Flow Orders (OFOs) to avoid system strain. Usually driven by high-demand cold periods or infrastructure outages or constraints. - High local or regional prices versus U.S. benchmarks may indicate issues. - High prices in affected markets lead to voluntary fuel switching for power sector and industrial customers with the ability to switch.	Periods of winter peak demand in pipeline-constrained New England
Tier 2: Significant Event	- A major transmission pipeline has an extended unplanned outage during a peak demand period. - Some gas is rerouted into the region on alternate pipelines, but due to capacity constraints, supply is interrupted to power plants and other customers with non-firm contracts. - Local distribution companies (LDCs) urge customers to conserve gas use. - Gas supply disruptions to power generators reduce available generation resources, forcing grid operators to issue emergency advisories or alerts. - Sharp spikes in local or regional prices versus U.S. benchmarks may indicate significant regional issues.	Bomb cyclone impacting New England (2018)
Tier 1: Major Event	- Severe outage/damage or supply shortage forces transmission pipelines and LDCs to interrupt supply to firm customers. - Loss of pressure in the gas distribution system causing gas to be shut off to firm customers (residential and commercial) - Restoring service is time-consuming, as the LDC must relight each customer's pilot light. - Vulnerable groups that rely on gas heating moved to shelters. - Loss of gas-fired generation leads to severe regional electricity shortages. Grid operators initiate rolling blackouts to preserve grid stability.	Texas extreme cold weather event (2021)

Event Timing

- **The Playbook defines two time periods:**
 - **Pre-event:** An event is predicted within days or hours (winter storm, typhoon), and stakeholders may be able to mobilize and prepare for response.
 - **Response/Restoration:** The time period from when the first event impacts occur through restoration.
- **Some no-notice events will not have a pre-event component.**

EXAMPLE Matrix

EMERGENCY MANAGEMENT

Pre-Event

Response

Tier 3: Enhanced Watch

- **Situational Awareness and Information-Sharing:** Monitor ESF-12 fuel situation reports
- _____
- _____

- **Situational Awareness and Information-Sharing:** Provide ESF-12 situation reports to local and tribal emergency managers
- **Situational Awareness and Information-Sharing:** Survey potential fuel concerns of local and tribal emergency managers and communicate to ESF-12. Set up coordination call between local and tribal emergency managers and ESF-12 to address fuel concerns as needed
- _____

Tier 2: Significant Event

- **Situational Awareness and Information-Sharing:** Establish contact with local, tribal, state, and federal governments
- **Resource Management:** Survey potential fuel needs with local and tribal emergency managers
- _____
- _____

- **Situational Awareness and Information-Sharing:** Activate emergency operations center to facilitate statewide coordination and response to significant event
- **Situational Awareness and Information-Sharing:** Communicate with local emergency managers to confirm extent of impacts, including impacts to vulnerable communities
- **Public Messaging:** Activate Joint Information Center for public messaging
- **Resource Management/Impact Mitigation:** Assist with distribution of resources to mitigate liquid fuels shortages, such as warming or cooling centers and fresh water, especially to vulnerable communities
- **Resource Management:** Assist local and tribal emergency managers to submit fuel requests as needed
- _____

Tier 1: Major Event

- **Situational Awareness and Information-Sharing:** Activate emergency operations center to facilitate statewide coordination and response to major event
- **Resource Management:** Monitor status of local and tribal fuel requests submitted to ESF 12
- _____

- **Resource Management/Impact Mitigation:** Support federal agencies and ESF 12 to administer fuel allocation, establish temporary fueling locations for emergency responders, and other state programs to mitigate fuel shortage as needed
- _____

UTILITIES AND GRID OPERATORS

Pre-Event

Response

EXAMPLE Matrix

Tier 3: Enhanced Watch	• Public Messaging: Begin public messaging about the anticipated event and the possibility of outages • Resource Management: Conduct inventory of resources available for response • _____	• Situational Awareness and Information-Sharing: Assess damage to distribution system and restore outages as conditions permit • Public Messaging: Update utility outage map or other public information-sharing tools • Public Messaging: Develop, publish, and update estimated times of restoration • Restoration: Restore customers according to set prioritization method
Tier 2: Significant Event	• Resource Management: Stage equipment and crew near predicted impact areas • Resource Management: Begin coordination with other utilities and electric industry groups about anticipated mutual aid • _____ • _____	• Resource Management: Crews may shelter in place during event if conditions (e.g., high winds) do not permit damage assessment and restoration • Situational Awareness and Information-Sharing: Establish contact with local and state emergency managers, state ESF-12, or federal ESF-12, as needed • Resource Management: Activate mutual aid agreements, as needed • Resource Management: Individual utilities or industry groups coordinate with state partners on restoration challenges and requests for state resources • Public Messaging: During an electricity shortage, utilities may request voluntary electricity conservation from customers via public messaging • Situational Awareness and Information-Sharing: Report event to relevant federal authorities, if required (OE-417s, cyber event)
Tier 1: Major Event	• Resource Management: Crews may be evacuated for their safety in advance of an anticipated disaster, and/or staging areas may be relocated away from anticipated disaster area • _____ • _____	• Situational Awareness and Information-Sharing: Assess transmission system damage • Resource Management: Industry groups coordinate with federal ESF-12 on regional or large-scale issues, including challenges to restoration (debris, flooding), specialized restoration equipment, or generators for substations • Impact Mitigation: Implement rolling blackouts to stabilize grid • Impact Mitigation: For cyber events, investigate the scope of the intrusion and its impact on infrastructure; take action to identify the source of the breach and prevent the situation from escalating • Regulatory Relief: Request and coordinate 202(c) waiver or EPA emissions waivers from the federal government



➔ Progress on Alaska's Response Matrices



Alaska-Specific Edits to Matrix Structure

- ICF is updating the matrices to align with Alaska's unique energy delivery systems and specific stakeholders
- **Stakeholders for inclusion:**
 - Alaska Energy Authority
 - Dept. of Military and Veterans Affairs (DMVA), Division of Homeland Security & Emergency Management
 - Governor's Office
 - Public Utilities, Natural Gas Companies, Refiners, and Pipeline Companies, etc.
- **Location sub-sections added in to address event location (Railbelt vs. a rural community)**

Case Study #1: Sept. 2022 Typhoon Merbok

- Typhoon Merbok lashed over 1,000 miles of Alaskan coastline in September 2022 and affected dozens of rural communities.
- Affected communities experienced high winds and significant flooding. Impacts to various communities included:
 - Fuel tanks washed away
 - Fuel spill
 - Erosion and flooding on roads leading to energy infrastructure
 - Damage to the power grid
 - Generator issues

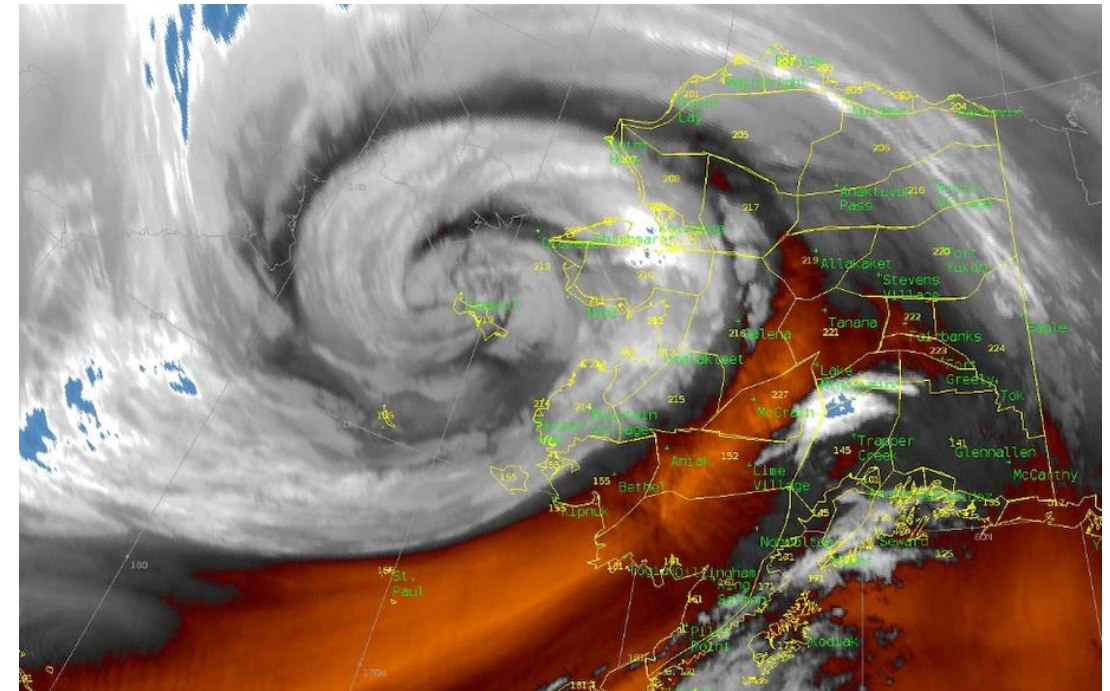


Image via [Washington Post](#)

Playbook Tier Severity: Tier 1 for affected communities

Case Study #2: Dec. 2018 Anchorage Earthquake

- A magnitude 7.0 earthquake struck north of Anchorage, Alaska, on November 30, 2018, at 8:29 AM.
- The earthquake damaged the Intertie, causing **Golden Valley Electric Association** to lose 30 MW of generation.
- **Energy considerations:**
 - Substation and transmission tower damage
 - Backup generation capacity
 - Stored fuel quantity
 - Road conditions for additional fuel delivery
 - TAPS damage for future fuel production



Image via [Washington Post](#)

Playbook Tier Severity: Tier 2, with damage incurred but limited customer impacts



Content of Matrices

- Specific actions in the matrices are being drawn from stakeholder conversations, plus emailed input

Next Steps on Response Matrices

- **ICF has completed an initial draft of the electricity matrix set**
 - AEA is currently reviewing
- **Natural gas and liquid fuel matrix sets: To be completed in February**
 - Pending stakeholder input, including Governor's Office and additional utilities/industry
- **After AEA review, will distribute completed matrices to relevant stakeholders for review and input**



→ Questions on Response Playbook?

