Idaho Energy Resilience Retreat

November 15 - 16, 2018

National Governors Association
Center for Best Practices

#WeTheStates

U.S. DEPARTMENT OF
ENERGY

Infrastructure Security
& Energy Restoration

Prepare. Respond. Adapt.

DOE Resilience Resources

Infrastructure Security and Energy Restoration (ISER) Division, Office of Cybersecurity, Energy Security, and Emergency Response (CESER), U.S. Department of Energy (DOE)

November 2018

Outline: DOE Resources

1. Introduction to the Infrastructure Security and Energy Restoration (ISER) Division
2. Overview of ISER's State, Local, Tribal and Territorial (SLTT) Program
3. Projects and Activities

Infrastructure Security and Energy Restoration (ISER)

Preparedness and Exercises

- Energy Sector Exercises
- Energy Assurance Planning
- Sector Specific Agency Responsibilities
- Risk and Hazards Analysis
- International & Defense
- Cyber Preparedness

Emergency Response and Recovery

- Emergency Response
- Cyber Incident Coordination
- Energy Sector Situational Awareness and Analysis

DOE's Sector Specific Agency (SSA) Authorities

FAST Act (2015)

Codified DOE's SSA Role

PPD-21 –Establishes **a s**hared responsibility among the Federal government, SLTT entities, and public and private owners and operators for CI security and resilience

PPD-41 –Federal Government's response to any cyber incident involving government or private sector entities

U.S. Department of Energy (DOE) Office of CESER
Infrastructure Security and Energy Restoration (ISER) Division

State, Local, Tribal, and Territorial Governments (SLTT)	**Oil and Natural Gas Subsector Coordinating Council (ONG SCC)**	**Electricity Subsector Coordinating Council (ESCC)**	**Energy Government Coordinating Council (EGCC)**	**Emergency Support Function #12 – Energy**

ISER Programs

Preparedness and Exercises

Stakeholder Engagement
Supports coordinating councils for the interagency, and electricity and oil and natural gas sectors, and engages with states and local, tribal, and territorial governments on energy security

Cyber Preparedness
Coordinates to prevent, deter, and detect to cyber incidents

Exercises
Sponsors and participates in energy sector exercises and workshops for physical and cyber risks

Risks & Hazards
Conducts studies on potential impacts to the energy sector

International & Defense
Provides subject matter expertise to other countries at Secretary or State Department request

Emergency Response and Recovery

Emergency Response and Recovery
Facilitates the reestablishment of damaged energy systems from all hazards, during a declared emergency, a departmental activation, or during a national security special event, and supports cross-sector and inter-agency response efforts

Situational Awareness
Provides information sharing and situational awareness capabilities to support the public sector and decision-making during emergency preparedness and response

Situational Analysis
Provides assessments of all-hazards that impact, or have the potential to impact, the energy sector

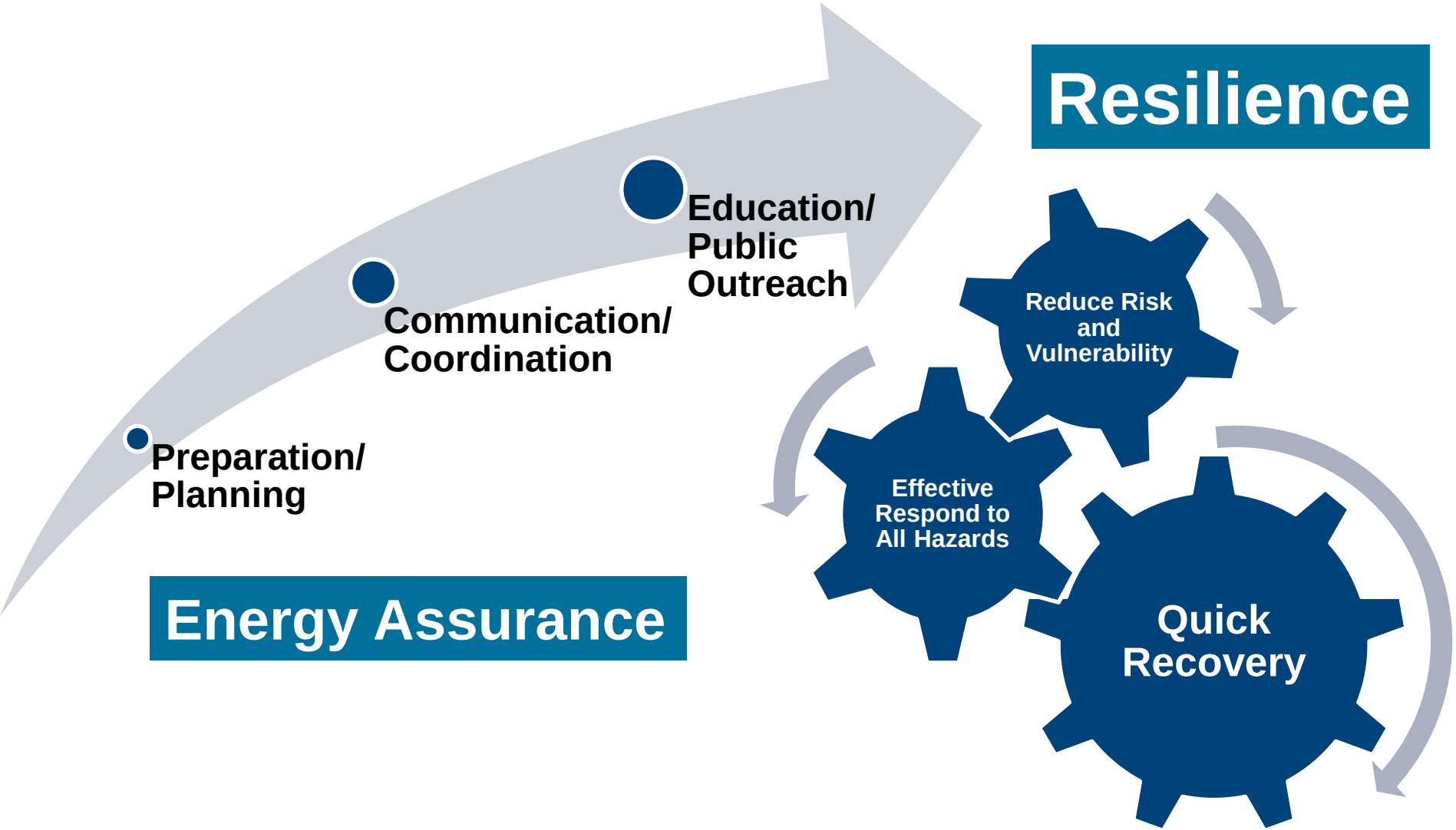
ISER Engagement with SLTT Governments

- **Build Relationships** –Facilitate relationships within and across state, local, tribal, territorial governments and agencies, and establish DOE as the primary advocate for the SLTT Energy Assurance community.

- **Increase Expertise** – Build SLTT capacity to serve national security interests for cybersecurity, energy security, and emergency response.

- **Encourage Comprehensive Planning** – Encourage energy security planning that is comprehensive, risk-based, operationally-focused, and cross-jurisdictional to enhance reliability and resiliency of the energy sector.

State Energy Assurance Planning

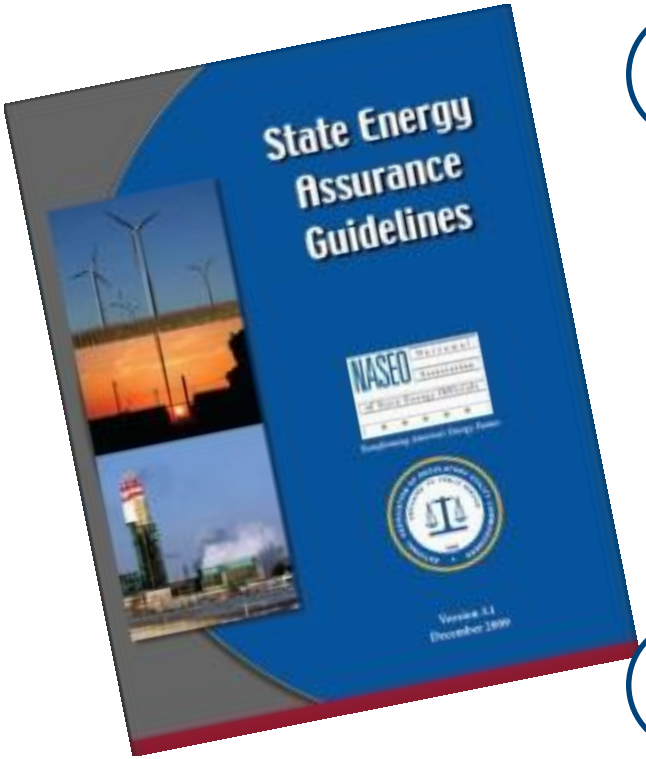


State Role in Energy Assurance Planning

"All response is local. Energy Assurance Planning supports successful state and local response, as well electricity and oil and natural gas counterparts."

Data Tracking and Monitoring	Authorities & Responsibilities	Procedures and Processes	Contacts	Federal Framework
• Capacity and Flows • Critical Infrastructure • Threats and Hazards	• Emergency Declarations • Waivers • Connection to other state plans	• How to Declare Emergency • Emergency Electrical Procedures • Petroleum Shortage Plans • Public Outreach	• Local Govt • Other State Agencies • Neighboring States • Decision-makers • Petroleum suppliers • Gas and electric utilities • Distribution companies • Industry associations	• National Response Plans • National Infrastructure Protection Plan • Energy Sector Specific Plan

State Energy Assurance Plans



- Energy profile
- Historical events and actions taken
- Roles of energy assurance/response agencies
- Interrelationship of large energy producers, consumers, associations to state/local
- Methods of assessing severity and consequences of energy disruptions and tracking rate of recovery
- Emergency communications protocols
- Management decision processes

EAP Resources:
https://www.naseo.org/energyassurance

Executive Authority During Energy Emergencies

- Outlining the Governor's Existing Authority
- Identifying the Scope and Scale of the Event
- Determining the Execution of Actions
- Coordinating and Communicating with Key Stakeholders
- Appendix A: Example Executive Orders
- Appendix B: List of Notable Executive Orders by Element
- Appendix C: Example Federal Regulation Exemption Request Waivers

See www.nga.org/center/publications

State Resources

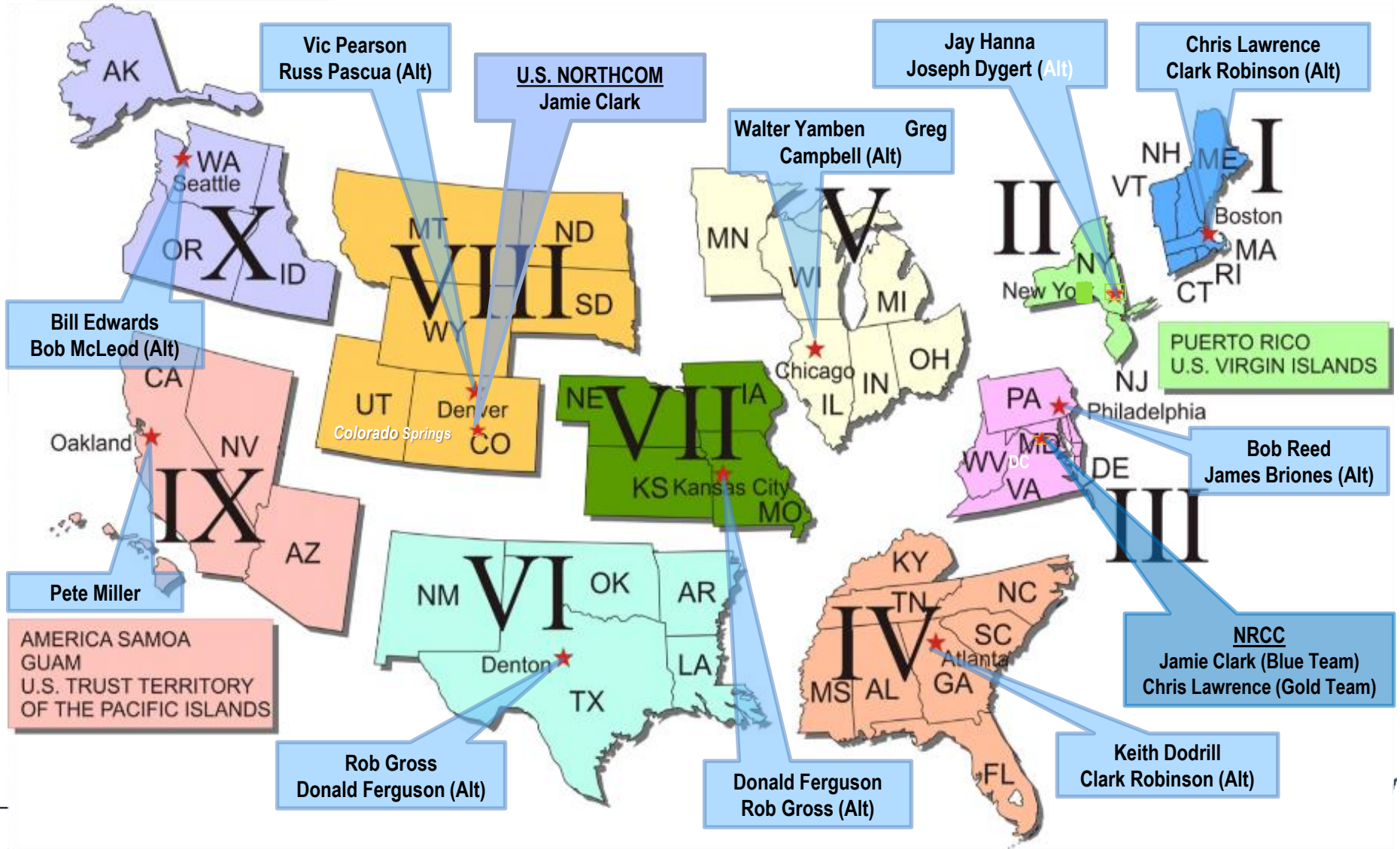
- EAGLE-I : https://eagle-i.doe.gov/login
- ISERnet: https://www.oe.netl.doe.gov/ISERNET/login.aspx
- Energy Waiver Library: https://www.energy.gov/ceser/energy-waiver-library
- DOE Situation Report Website: https://www.energy.gov/ceser/activities/energy-security/monitoring-reporting-analysis/emergency-situation-reports
- DOE Regional Coordinators: See map and email energyresponsecenter@hq.doe.gov for contact information.

Regional Coordinators

ANTHONY LUCAS
Federal Program Manager

KEN BUELL
Director, Emergency Response & Recovery

JAMIE CLARK
National Response Coordinator



DOE Related Project Examples

Energy Assurance Accelerator Pilot	• For islands and remote communities • Develop State Energy Emergency Preparedness and Response Playbooks to operationalize response actions.
NGA Retreats	• Retreats in Idaho, Oregon and Maryland to implement NGA State Risk Assessment and Planning Tool (SRAPT).
Grid Modernization Initiative	• Development of new architectural concepts, tools, and technologies that measure, predict, protect, and control the grid of the future.
North American Energy Resilience Model	• Planning and contingency analysis model to examine vulnerabilities in the North American energy system.

State and Local Team

Kate Marks
Sector Engagement

Kate.Marks@hq.doe.gov
202-586-9842

Kirsten Verclas
Fellow

Kirsten.Verclas@hq.doe.gov

202-287-6557

Roles and Responsibilities in Power Outage Planning & Resiliency

Megan Levy
Energy Assurance Coordinator
Wisconsin Office of Energy Innovation
11/15/2018

Wisconsin Office of Energy Innovation

A Brief History of the Office of Energy Innovation: Wisconsin's State Energy Office

- 56 Energy Office (50 states 6 territories)
- Energy Policy & Conservation Act of 1975
- Each state is required, under 42 U.S.C. § 6323(e)(1), to submit an energy emergency plan that it will utilize in the case of an energy supply disruption.
- Moved in 2015 to PSCW, (ch. 16.955 Department of Administration, State Planning and Energy has been updated to Ch. 196.025(7) as of January 2018).

Chapter 196.025(7) Information.

"**(7)** State energy office.

(a) The commission shall do all of the following:

1. In cooperation with the other state agencies, collect, analyze, interpret, and maintain the comprehensive data needed for effective state agency energy planning and effective review of those plans by the governor and the legislature.

2. Administer federal energy grants, when so designated by the governor pursuant to s. 16.54.

3. Prepare and maintain contingency plans for responding to critical energy shortages so that when the shortages occur they can be dealt with quickly and effectively.

(b) The commission may provide technical assistance to units of government other than the state to assist in the planning and implementation of energy efficiency and renewable resources and may charge for those services. The commission may request technical and staff assistance from other state agencies in providing technical assistance to those units of government.

WISCONSIN EMERGENCY MANAGEMENT

OEI
Wisconsin Office of Energy Innovation

Emergency Management Organization

Federal Government — **FEMA**

State of Wisconsin — **Wisconsin Emergency Management**

Local Government — **County Emergency Management**

Our Mission

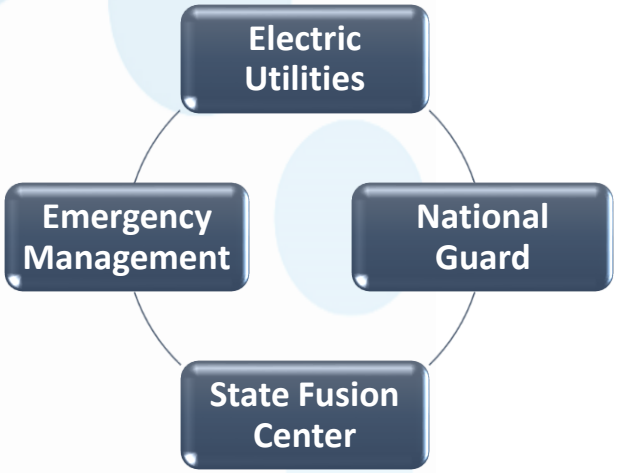
Wisconsin Emergency Management (WEM) coordinates with OEI/PSCW (lead advisory agencies) to mitigate energy issues of all shapes and sizes. OEI maintains the Energy Assurance Plan (an appendix to Emergency Support Function-12 Energy).

OEI
Wisconsin Office of Energy Innovation

Wisconsin Electrical Utilities / Department of Military Affairs

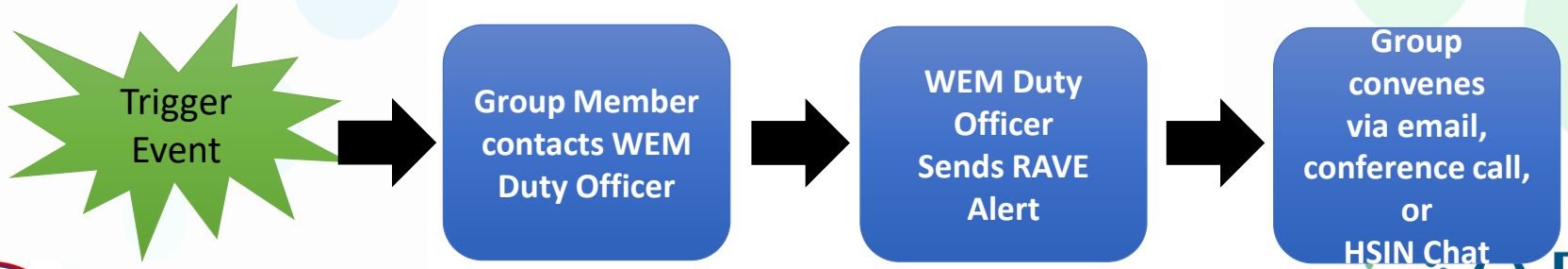
Public Private Partnership

Utility Coordination Group Membership



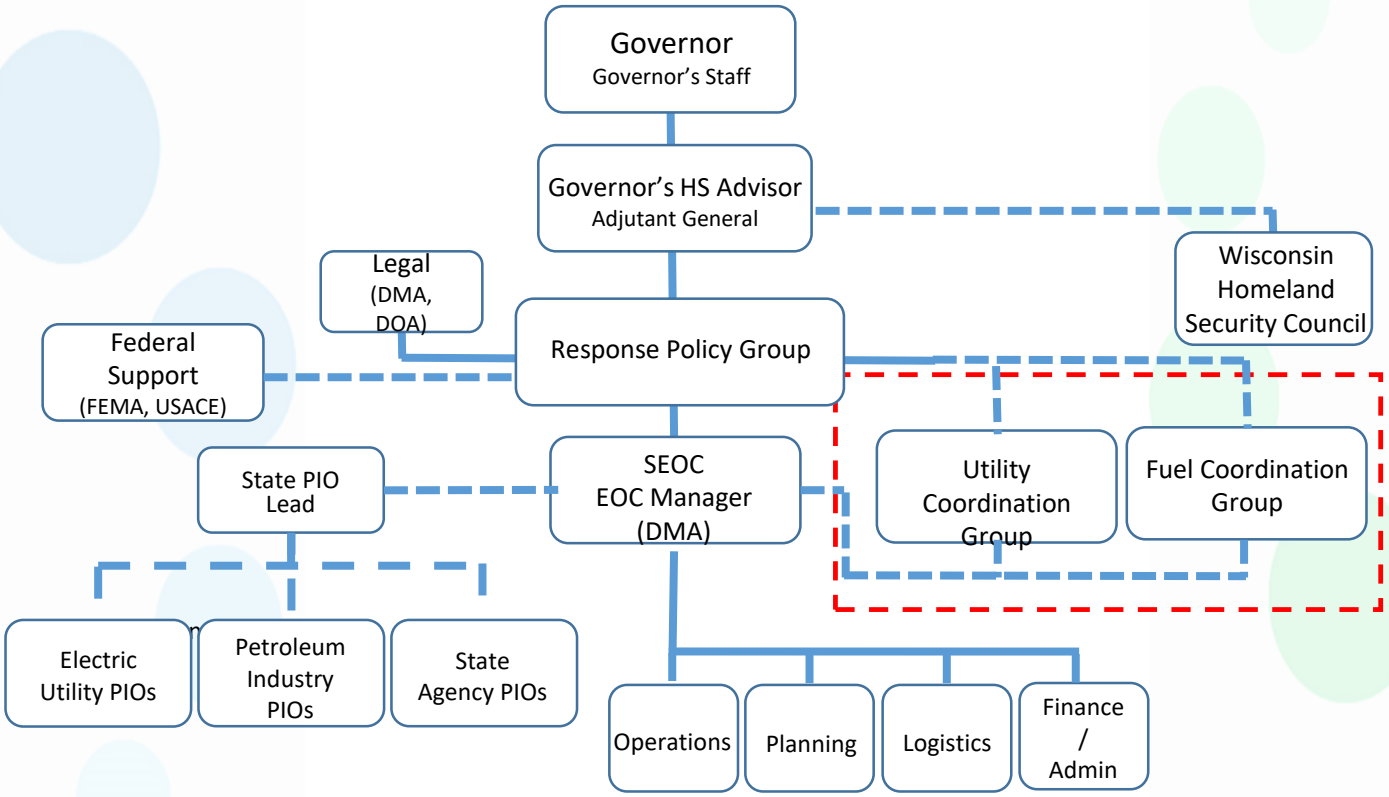
Trigger Guidelines:

1. Intentional damage
2. Credible threat
3. Widespread power outage underway
4. A significant interruption to required supply chains



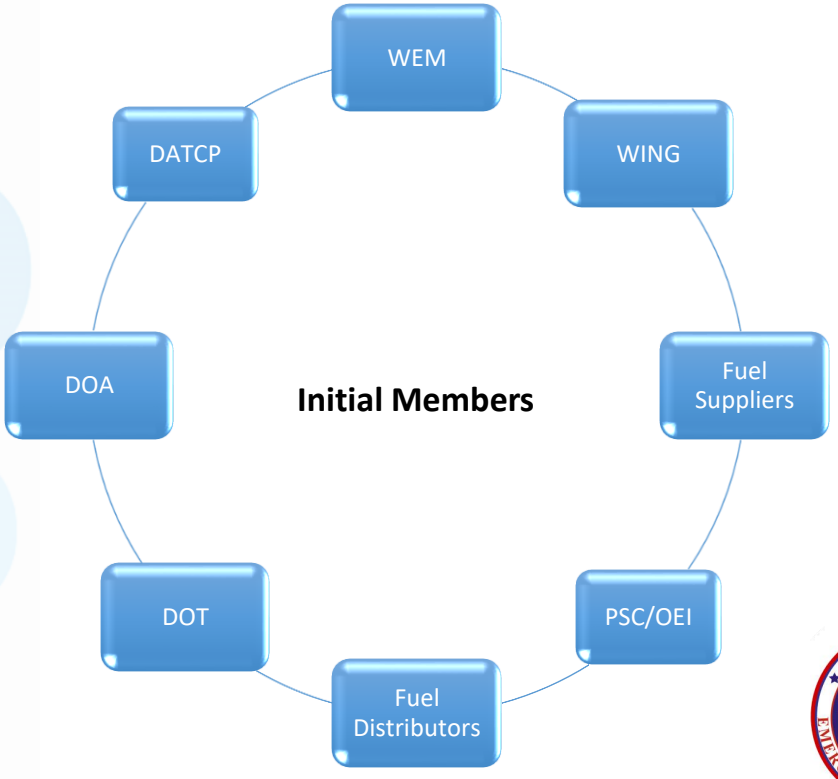
Wisconsin Office of Energy Innovation

Proposed Energy Incident Structure



Wisconsin Office of Energy Innovation

Fuel Coordination Group



Wisconsin Office of Energy Innovation

Overall Concept

Shortage likely to occur (or occurring)

- Credible threat of significant power outage
- Key infrastructure shut down (pipelines, etc.)
- World events indicate a shortage is imminent

FCG call initiated

- Key industry and government personnel notified
- Discuss response options and make recommendations

Measures implemented

- Waiver process
- Conservation measures initiated
- Emergency Contracts

Additional calls as needed

What Can You Do?

Facility Owners/Operators

- Develop Continuity of Operations Plans (COOP)
  - Can you continue your essential functions at another location?
- Understand your facility's backup generator
  - What circuits does it actually power?
  - Fuel type & quantity
  - Run-time
  - Maintenance cycle
- Talk with your fuel vendor
  - What are their plans during a significant power outage?
  - How do you contact them in an emergency?
- Know how to request assistance if these plans fall through

What Can You Do?

Local Governments

- Develop contacts & relationships with local fuel vendors
- Develop emergency fuel plans & agreements with local vendors
- Understand and prioritize infrastructure in your jurisdiction
  - What facilities perform life safety functions?
  - What facilities enable responders to function during emergencies?
  - What facilities provide basic essential services (water, wastewater, power, etc.)
- Know how to request assistance if your resources are exhausted

Statute Waivers & Variances

- Anti price gouging: Announcement of Period of Abnormal Economic Disruption
- Vehicle weight limits and hours of service waivers
- Environmental Waivers:
  - Reformulated Gasoline (RFG) – Milwaukee Area
  - Reid vapor pressure (RVP) – Summer vs. Winter Gasoline
  - Vapor recovery at terminals

Conservation Measures

Even-Odd Purchasing & Minimum Purchase Plan

Line at the Hess station at 44th Street and 10th Avenue, New York City, 1979 – source: NY Times 11/9/12.

Hurricane Sandy Response (New York and New Jersey)

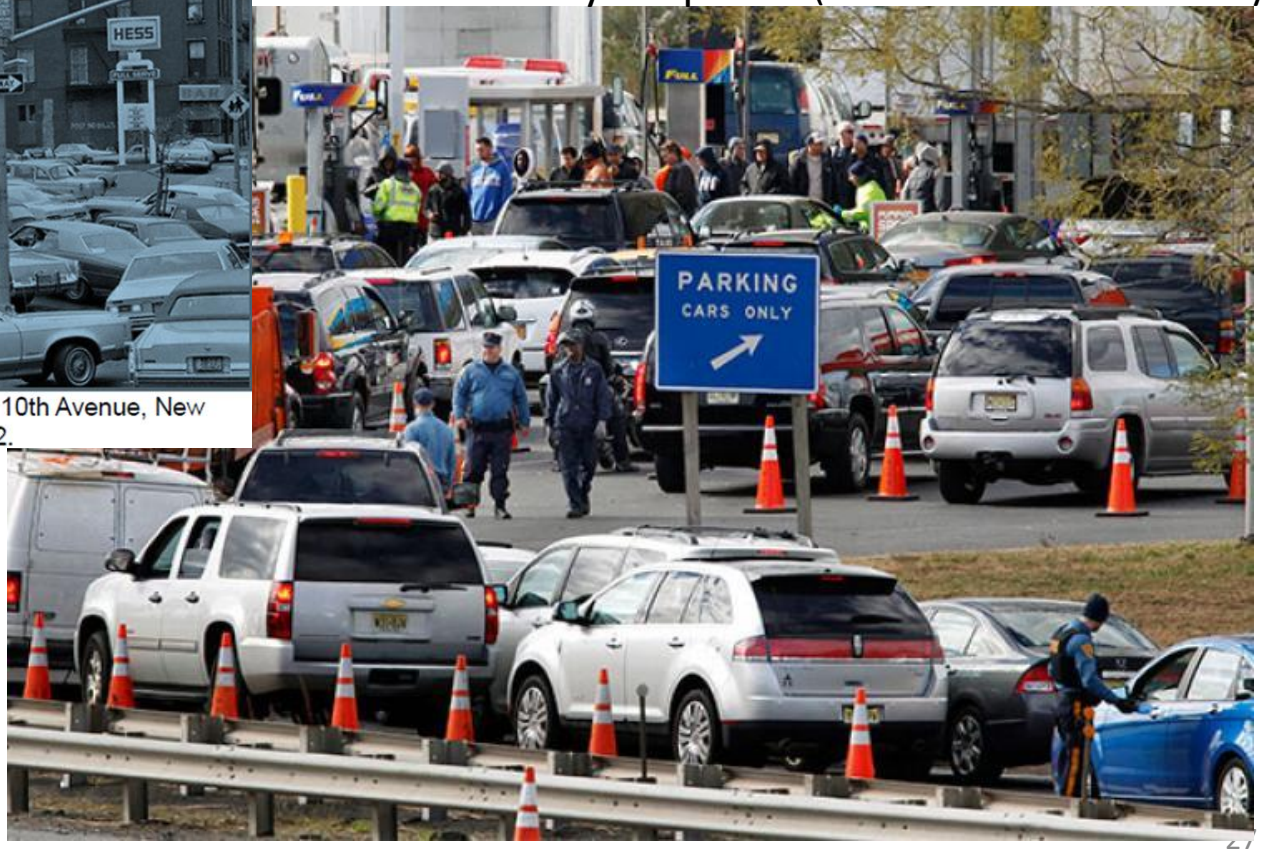


Photo Credit: Michael Walsh, New York Daily News, Sunday Nov 4, 2012

Federal Support

FEMA and the U.S. Army Corps of Engineers can provide fuel and generator support during significant power outage events

- FEMA will support state requests during a disaster, particularly in the “lifeline” sectors
  - Transportation
  - Communications
  - Water & Wastewater
  - Energy

Electric Utility – Emergency Restoration Mutual Assistance

Brent Van Patten
Idaho Power

November 15, 2018

Mutual Assistance for Electric Utilities

- What is it?
- How is it Managed?
- What Happens when Disaster Strikes?

What is Mutual Assistance?

- Electric Industry's way to Pool Resources During Emergencies
- Groups of Utilities Agree to Help Each Other During Emergencies
- Utilities are Members of Mutual Assistance Groups (Regional)
- Members Sign Mutual Assistance Agreement
- During Emergencies, Members Help Each Other According to the Agreement

How is Mutual Assistance Managed?
-The Groups

- Edison Electric Institute
  - Investor Owned Utilities
  - 7 Regions in U.S.
- Western Region Coordinated/Supported by Western Energy Institute
  - Includes IOU's, REA's, Muni's, PUD's, Gas Companies – U.S. and SW Canada
- APPA, NRECA, States Have Mutual Assistance Groups
- Utilities Often Belong to Several Groups

How is Mutual Assistance Managed? -The Agreement

- Efficient – Terms for Work and Cost Recovery Determined BEFORE Emergency
- Assistance is VOLUNTARY
- Reimbursement for Reasonable Costs and Expenses
  - Wages, Travel/Living, Incidentals
  - Equipment, Materials, Supplies, Tools
  - Fuel, Maintenance, Repairs
- Requesting Company Provides Food, Lodging, Training, Communication
- Starts When Assistance Accepted by Requesting Utility
- Ends When Assisting Utility Returns to Home Base

How is Mutual Assistance Managed? -Administration

- Industry Trade Group (EEI, WEI, NRECA, APPA, etc)
  - Houses Agreements, Documents, Contacts
  - Maintain Continuity
- Executive Committee for Each Group Elected by Members
- Executive Committee Coordinates Resource Requests and Responses During Emergency
- Resource Requests Escalate to National Level if Region Cannot Meet Need

What Happens when Disaster Strikes?

- Affected Utilities Reach out to Executive Committee

- Executive Committee
  - Activates RMAG
  - Holds Conference Call with Members
    - Nature of Emergency Discussed
    - Resources Requested
  - Match Requests with Offered Resources

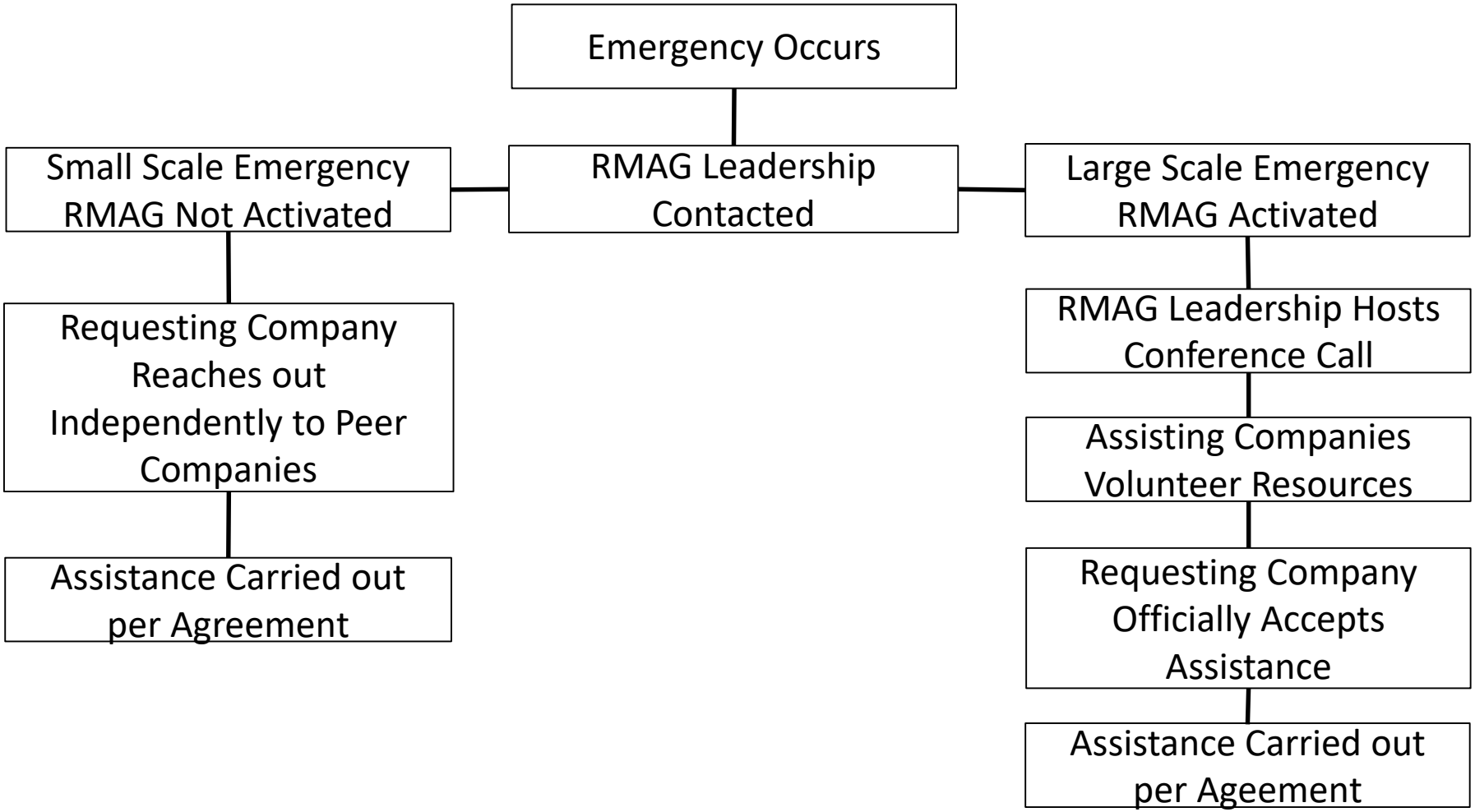
- Requesting Company Accepts Resources

What Happens when Disaster Strikes?

- Assisting Company Mobilizes to Worksite and Performs Work in Accordance with Agreement

- Requesting Company Supports and Reimburses Assisting Company in Accordance with Agreement

Putting It All Together



In Summary

Where Can Utilities Turn for Help when Their Resources are Overwhelmed?

- Mutual Assistance Groups are Pools of Peer Utilities from which to Draw Help
- Mutual Assistance Agreements
  - Previously Negotiated
  - Spell out Rules of Engagement During Emergencies

Questions?

Brent Van Patten, Idaho Power Engineering Leader

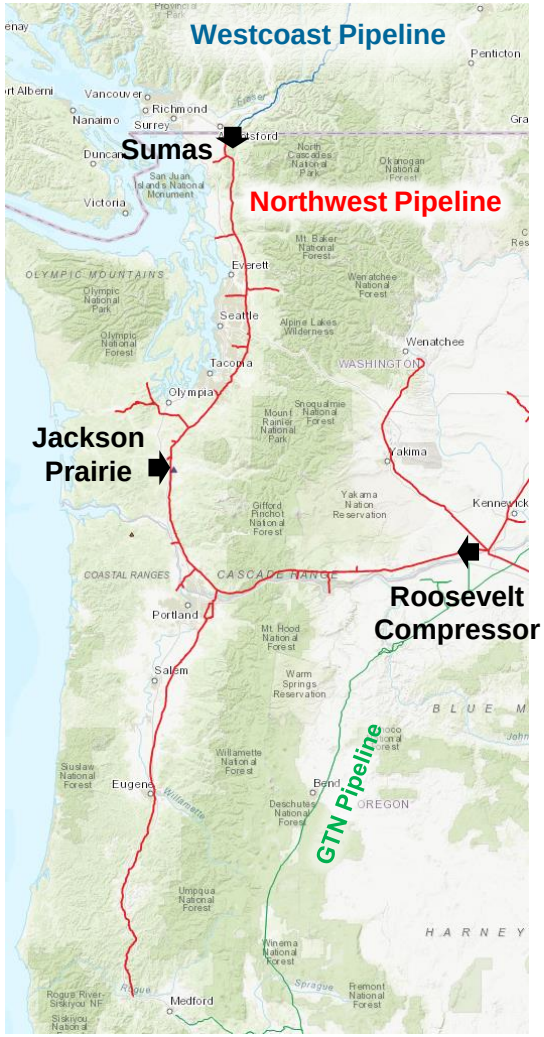
- bvanpatten@idahopower.com
- (208) 388-2514

WE MAKE ENERGY HAPPEN

October 9 Supply Disruptions

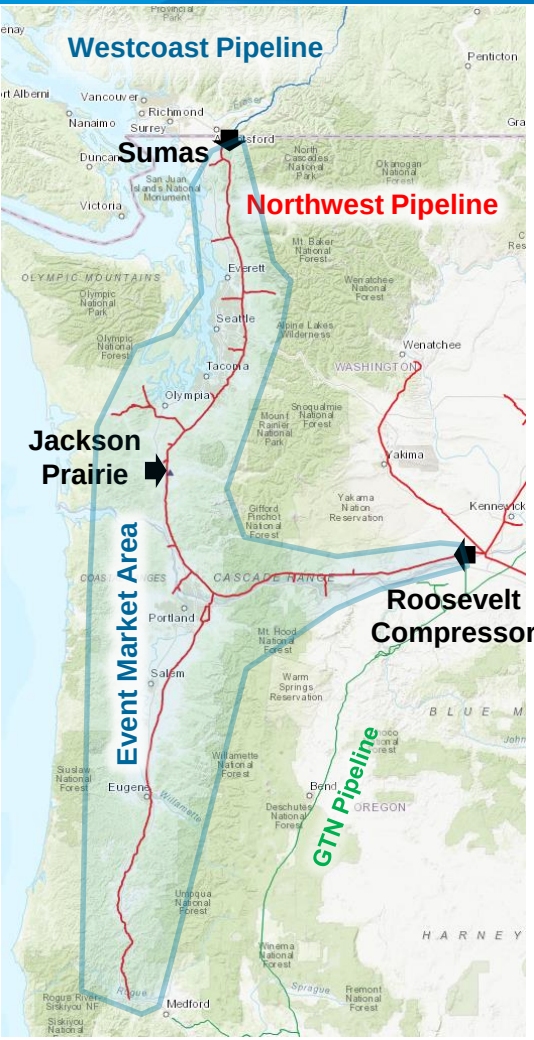
SUMAS COMPRESSOR STATION
Northwest Pipeline, Washington

Northwest Pipeline Overview



- **Northwest Pipeline is a Federally regulated interstate natural gas pipeline**
- **Local Utilities, Power Generation Plants, and Industrial Facilities rely on Northwest Pipeline as the primary source of gas in significant portions of Western Washington and Oregon**
- **Northwest is bi-directional and enables customers to transport gas from Canadian or Domestic supply sources, with gas entering the market area at Sumas Receipt or through Roosevelt Compressor:**
  - Sumas Receipt can receive up to 1.3 Bcf/d of Canadian production from Westcoast Pipeline at the Canadian border
  - Roosevelt Compressor can flow up to 0.55 Bcf/d from multiple domestic interconnects and producers
- **Jackson Prairie Storage (25.6 Bcf capacity) can deliver up to 1.2 Bcf/d into the market area and is used for system balancing by Northwest Pipeline**

October 9, 2018 – Northwest System Status



> **On October 9th, Northwest customers were delivering at an average rate of approximately 1.28 Bcf of Gas into the Market Area, and had scheduled an additional 1.21 Bcf for Oct 10**

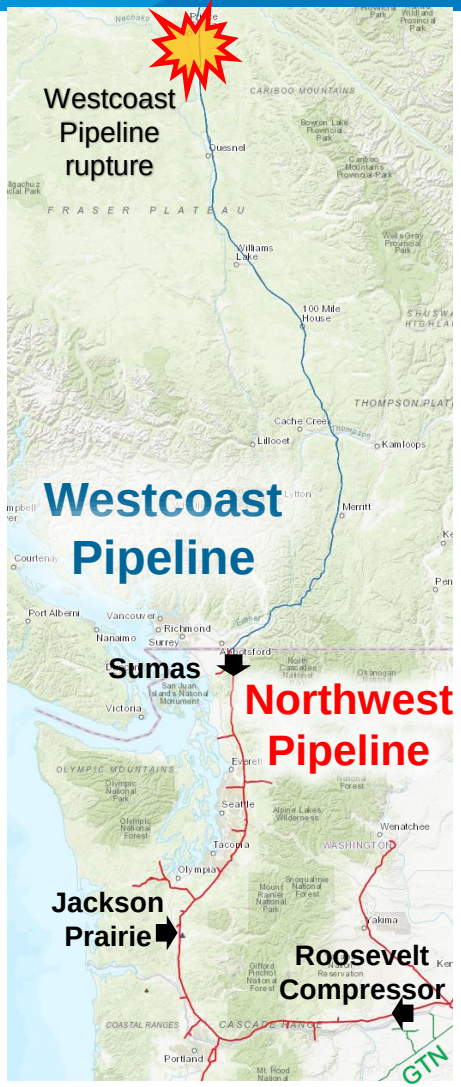
Expected Supply to Market Area	October 9 (Intraday)	October 10 (Evening)
Sumas Receipt	878,553	959,460
Roosevelt Compressor	397,763	246,052
Total	**1,276,316**	**1,205,512**

> **Planned maintenance was occurring on Northwest Pipeline prior to the winter season**

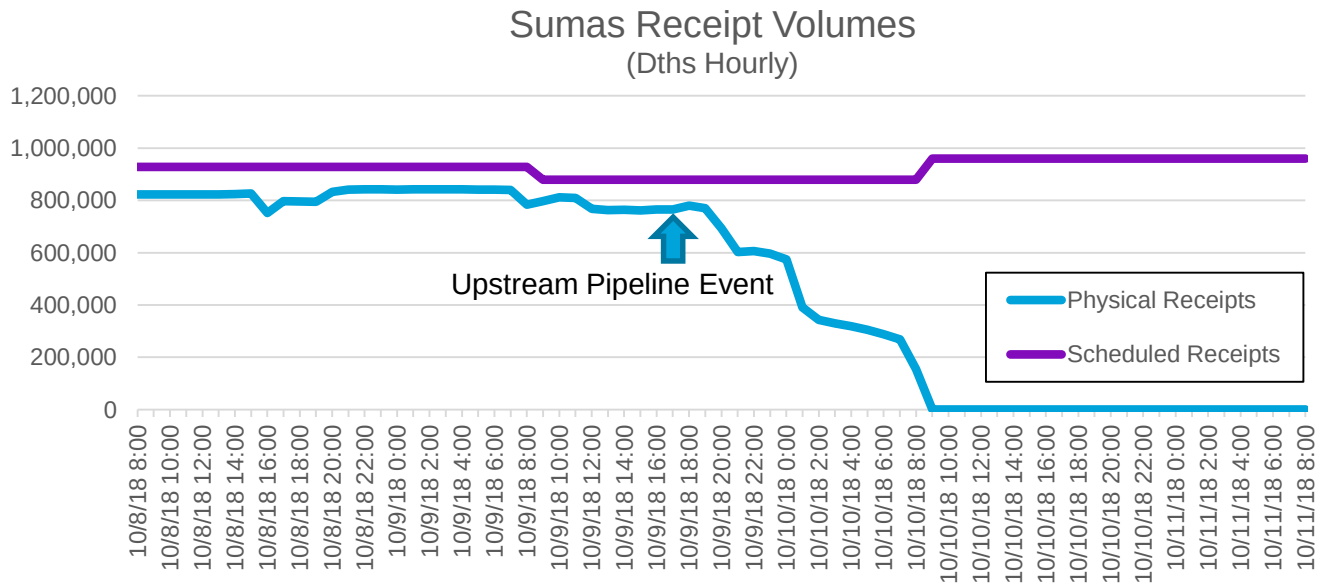
- Jackson Prairie was reduced from 1.3 Bcf to 0 as part of maintenance scheduled to last Oct 1-12
- Roosevelt Compressor was undergoing upgrades and reduced from 550,000 to only 400,000 as part of maintenance scheduled until October 15.
- Plymouth LNG, storage facility (west of Roosevelt) was liquifying and Clay Basin was requiring injections for downhole testing

Supply Source	Peak Capacity	Available Capacity
Sumas	1,314,750	1,314,750
Jackson Prairie	1,300,000	0
Roosevelt Compressor	546,000	400,000
Total	**3,160,750**	**1,714,750**

Westcoast Incident – October 9th ~6:45 pm mtn

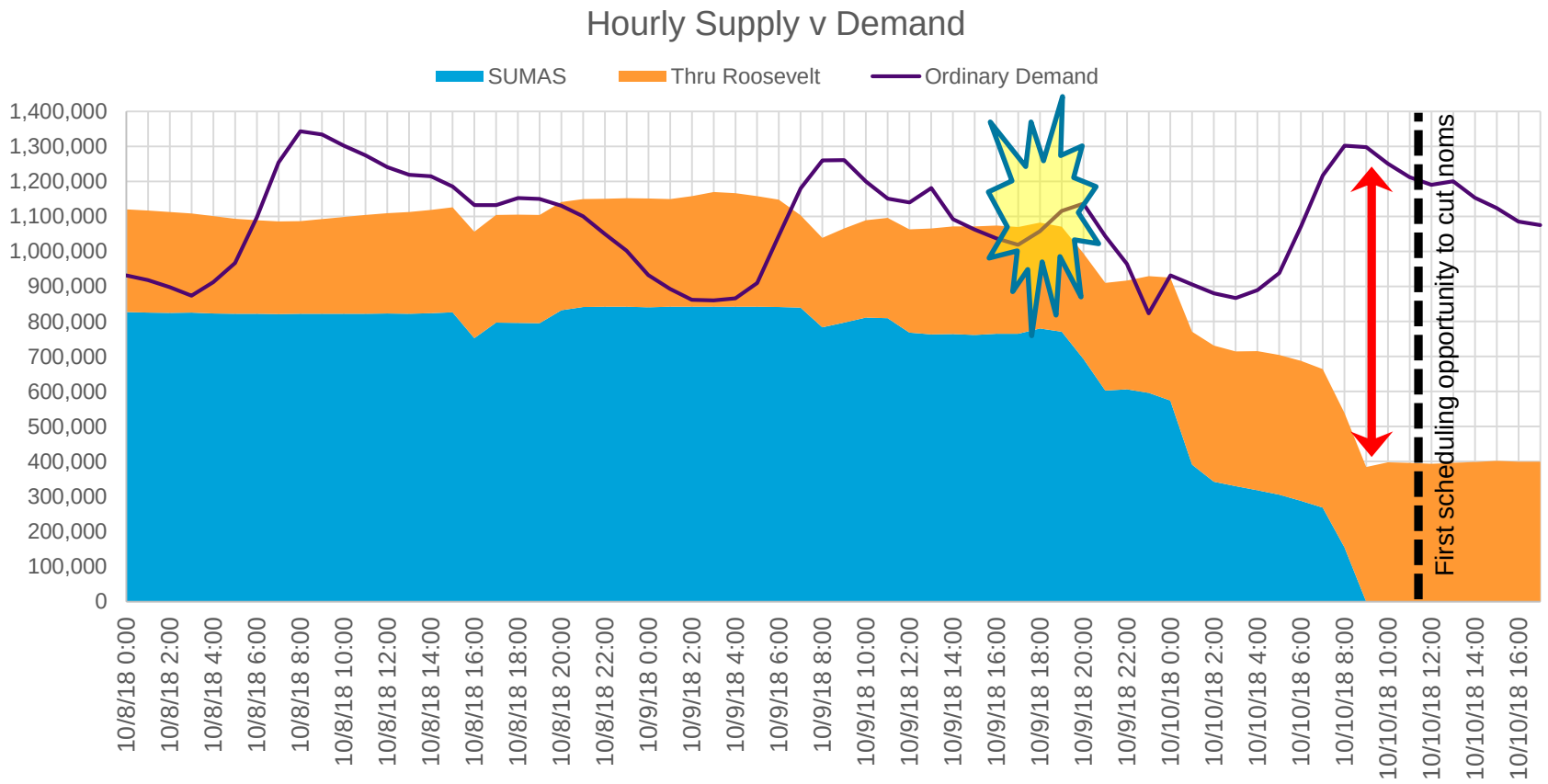


- On the evening of October 9, 2018, Westcoast Energy Inc.'s (Westcoast) BC Pipeline experienced a rupture on a 36-inch diameter upstream pipeline, causing a significant interruption to gas supply at Northwest's Sumas, Washington receipt point
- Deliveries at Sumas immediately began to fall and its was recognized the market would be in extreme danger of losing service to critical residential and other core loads
- By 9AM on October 10th, Northwest was receiving ZERO of 959,460 dekatherms customers were expecting to receive from Sumas



Critical Operating Condition Ensues

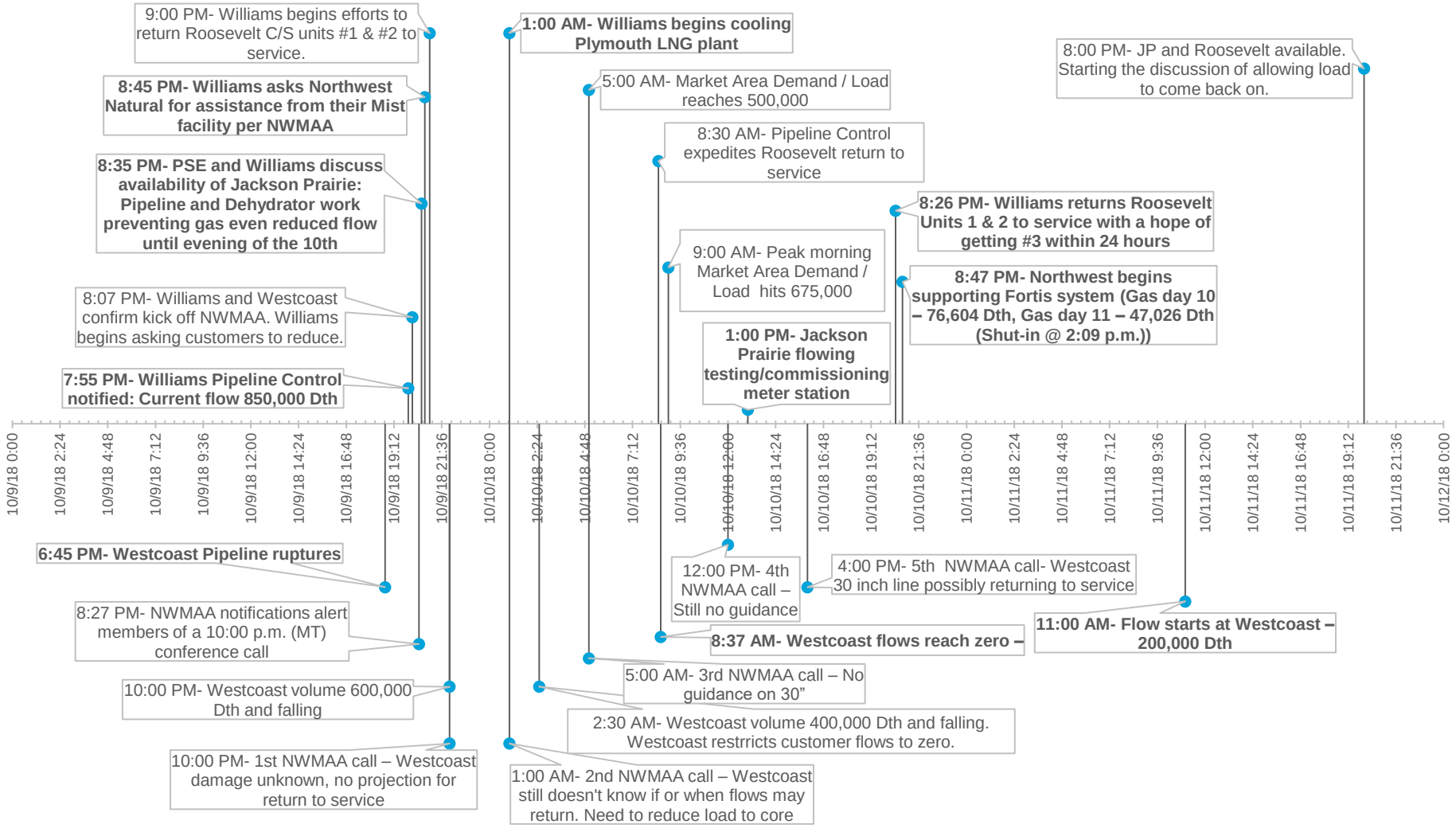
> Market area needs to shed Demand



Key Market Responses to Incident

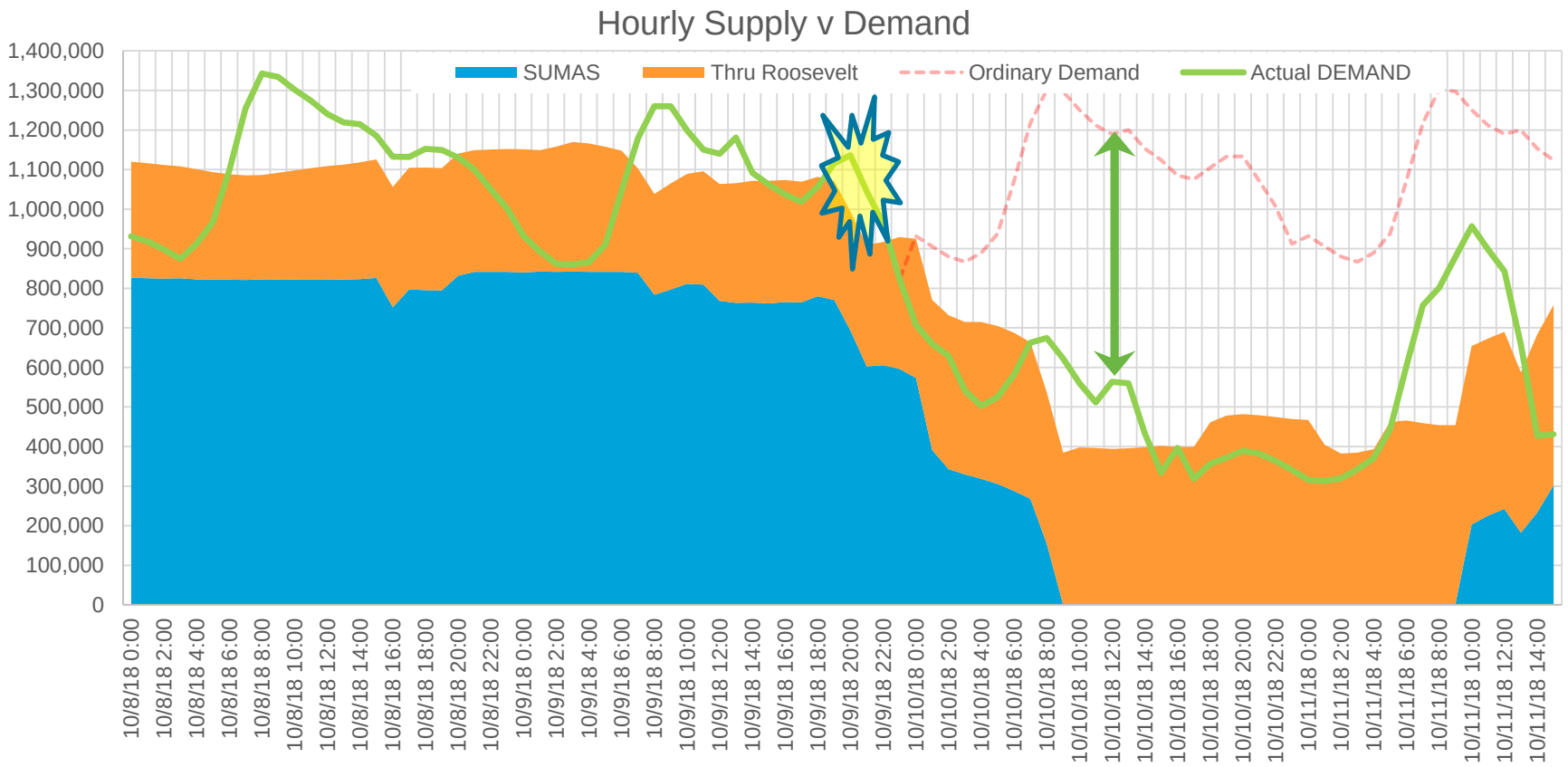
- **Activate the NWMAA group**
  - Consists of LDCs, pipelines and industry groups in the Pacific Northwest who operate, control natural gas assets or have an ability to assist in the case of an emergency
  - First call by 10:00 pm (approximately three hours after the incident)
  - Call included Westcoast, Fortis, Northwest, LDC's and power participants
  - Steps were put in-place to shed natural gas demand
    - Major power, industrial and LDC load started to come off the system immediately
- **Northwest issued overrun entitlement for gas day October 10th at 5%, thereafter 3%**
- **Northwest accelerated work to restore full operational service at Roosevelt compressor station**
- **Puget Sound Energy and Northwest expedited Jackson Prairie's return to service**
- **Northwest took steps to make Plymouth LNG supply available if required**
- **NWN provided significant relief by serving its demand from Mist**
- **Dominion Questar Pipeline at Clay Basin storage cancelled maintenance**

Initial Timeline of Events



NWMAA Success Story

> Customers shed demand and balance NWP



Identifying Gaps In Existing Plans

Idaho Energy Resilience Retreat
Ron Fisher, Ph.D.

November 15, 2018

www.inl.gov

Idaho National Laboratory

Cyber Threat 20 Year Perspective

The Commission has not discovered an immediate threat sufficient to warrant a fear of imminent national crisis. However, we are convinced that our vulnerabilities are increasing steadily, that the means to exploit those weaknesses are readily available and that the costs associated with an effective attack continue to drop. What is more, the investments required to improve the situation-now still relatively modest-will rise if we procrastinate. We should attend to our critical foundations before we are confronted with a crisis, not after. Waiting for a disaster would prove as expensive as it would be irresponsible.

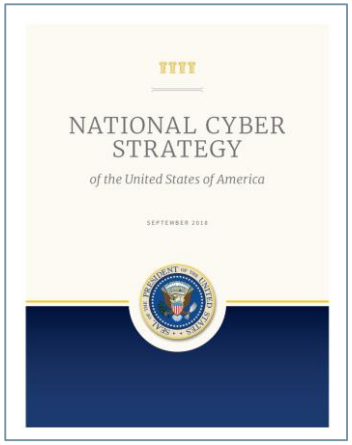
~Critical Foundations, 1997

"It is no longer a matter of if, but when, our critical infrastructure will be attacked. Seven weeks ago it was the Ukraine. That isn't the last we are going to see of this. That worries me."

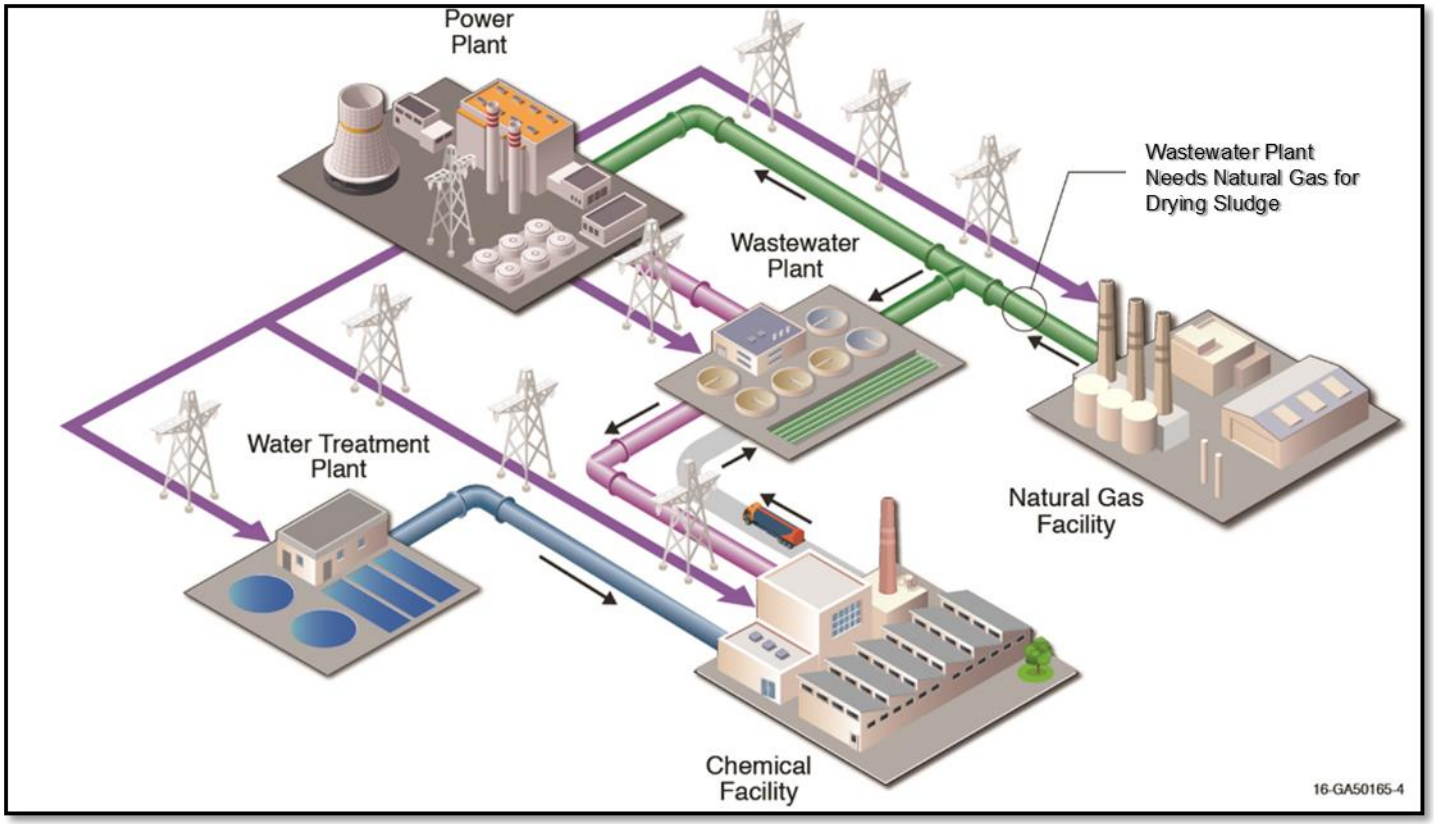
"What happens when attacks are used to manipulate data or some of its products?"

"You can no longer trust the data we are seeing and we are used to just seeing and accepting it."

~Admiral Michael Rogers, NSA Director
Keynote at RSA Conference (2016)



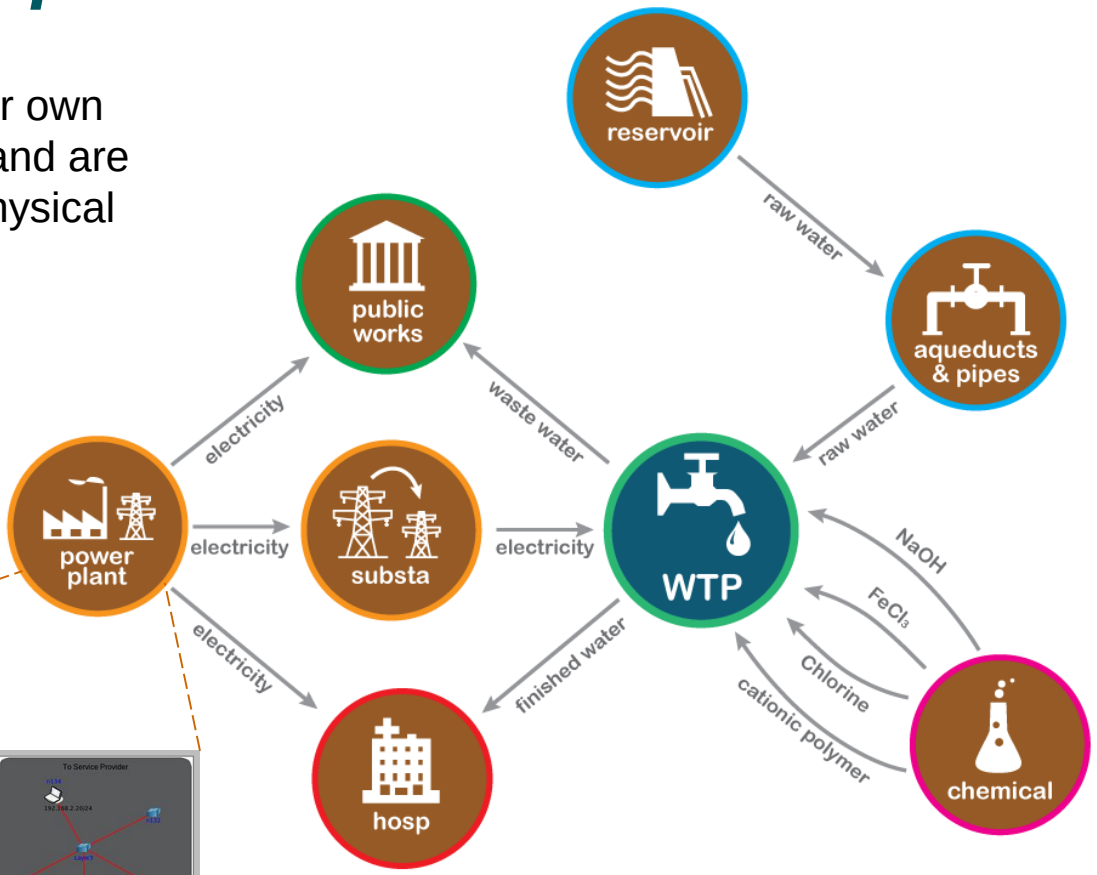
Infrastructure & Their Dependencies

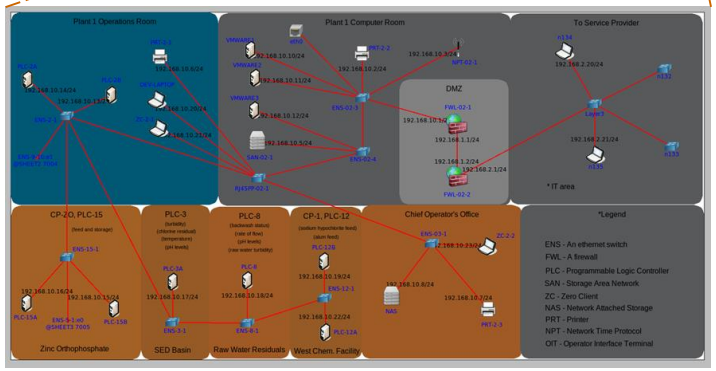


Infrastructure: are *engineered systems and facilities* that enable and enhance a communities ability to meet societal demands by facilitating the production, transport (transmission), and consumption of goods and services.

Cyber Interdependencies

Each of these have their own cyber-physical system and are part of a larger cyber-physical system.





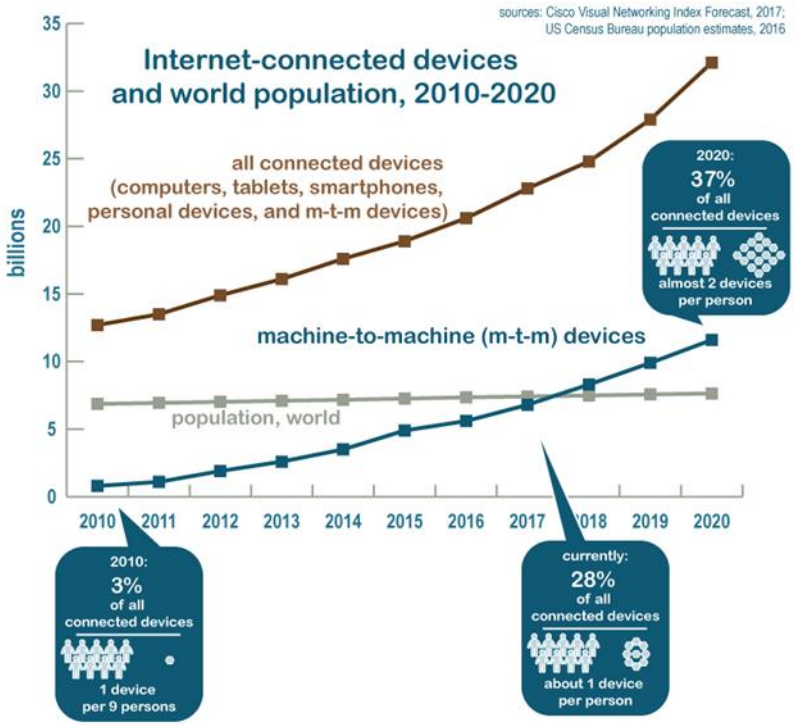
Cyber-Physical System Components

End Devices: Access Control, VoIP, Sensors, etc.

Network Devices: Server, Switches, Fiber, etc.

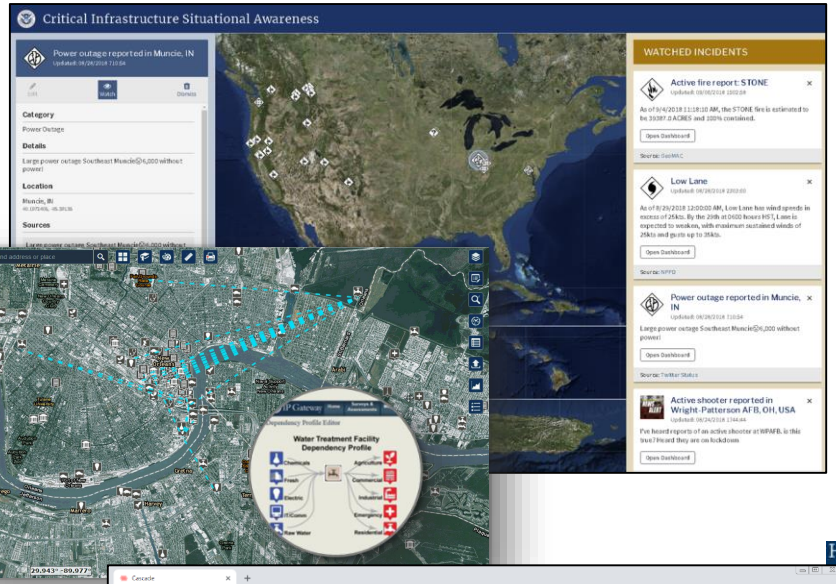
Components: IDS/IPS, Databases, LAN, WAN

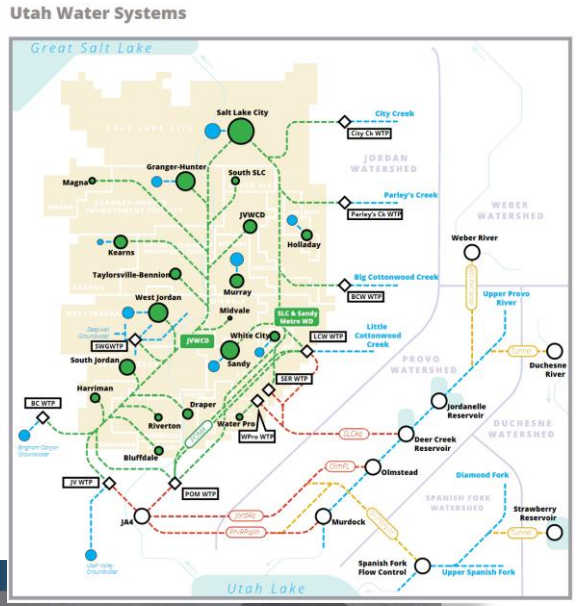
Cyber Connectivity to Critical Infrastructure

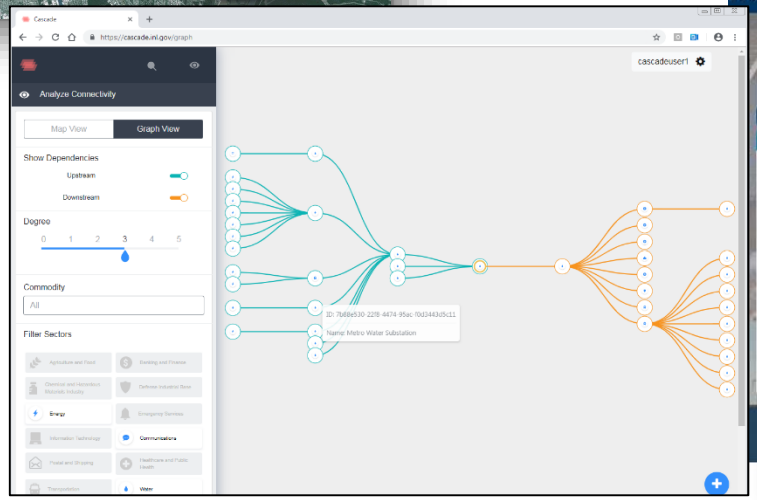


- **Our national critical infrastructure consists of systems of geographically distributed assets, from regional and national networks to micro-scale controllers and sensors**
- **Increasingly, these assets, across all scales, are connected via IT and OT networks – and thus potential cyber targets**

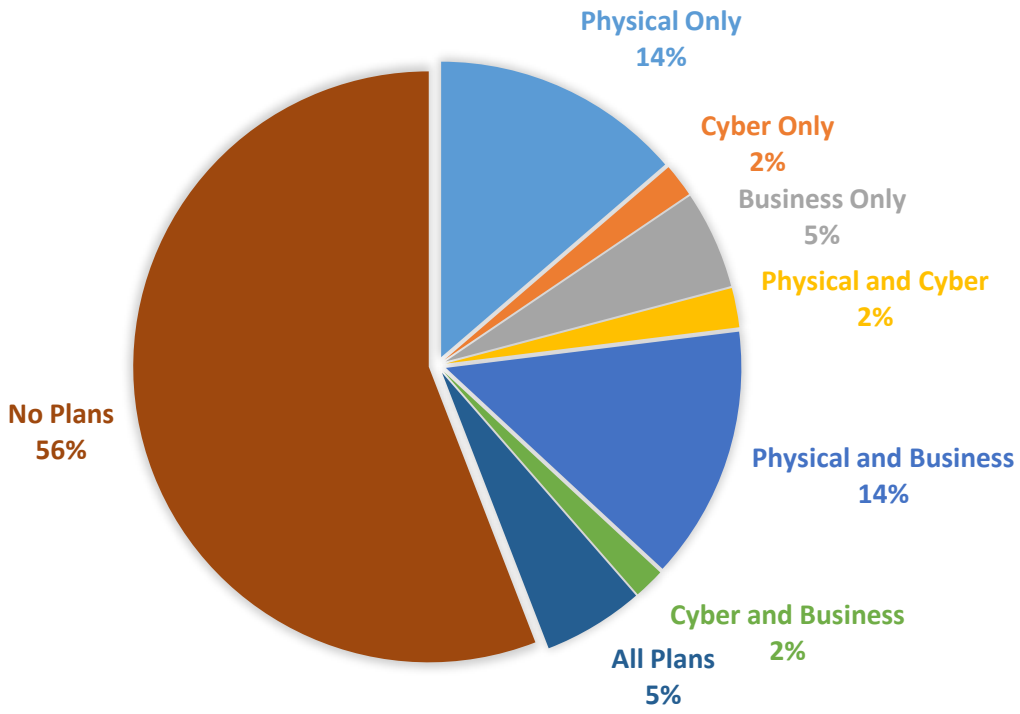
Analyzing, Mapping and Visualizing Relationships







Most Organizations Are Unprepared

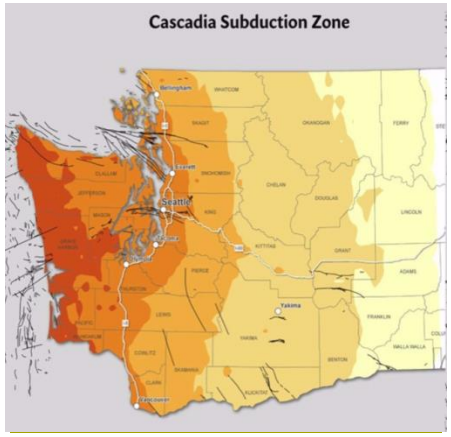


Only 5% of critical infrastructure owners/operators assessed have physical security, cyber security, and business continuity plans; and train and exercise them annually

Ron Fisher
(208) 526-5630
Ron.fisher@inl.gov

Idaho Energy Resilience Retreat

November 15-16 2018 – Boise, ID



National Association of State Energy Officials

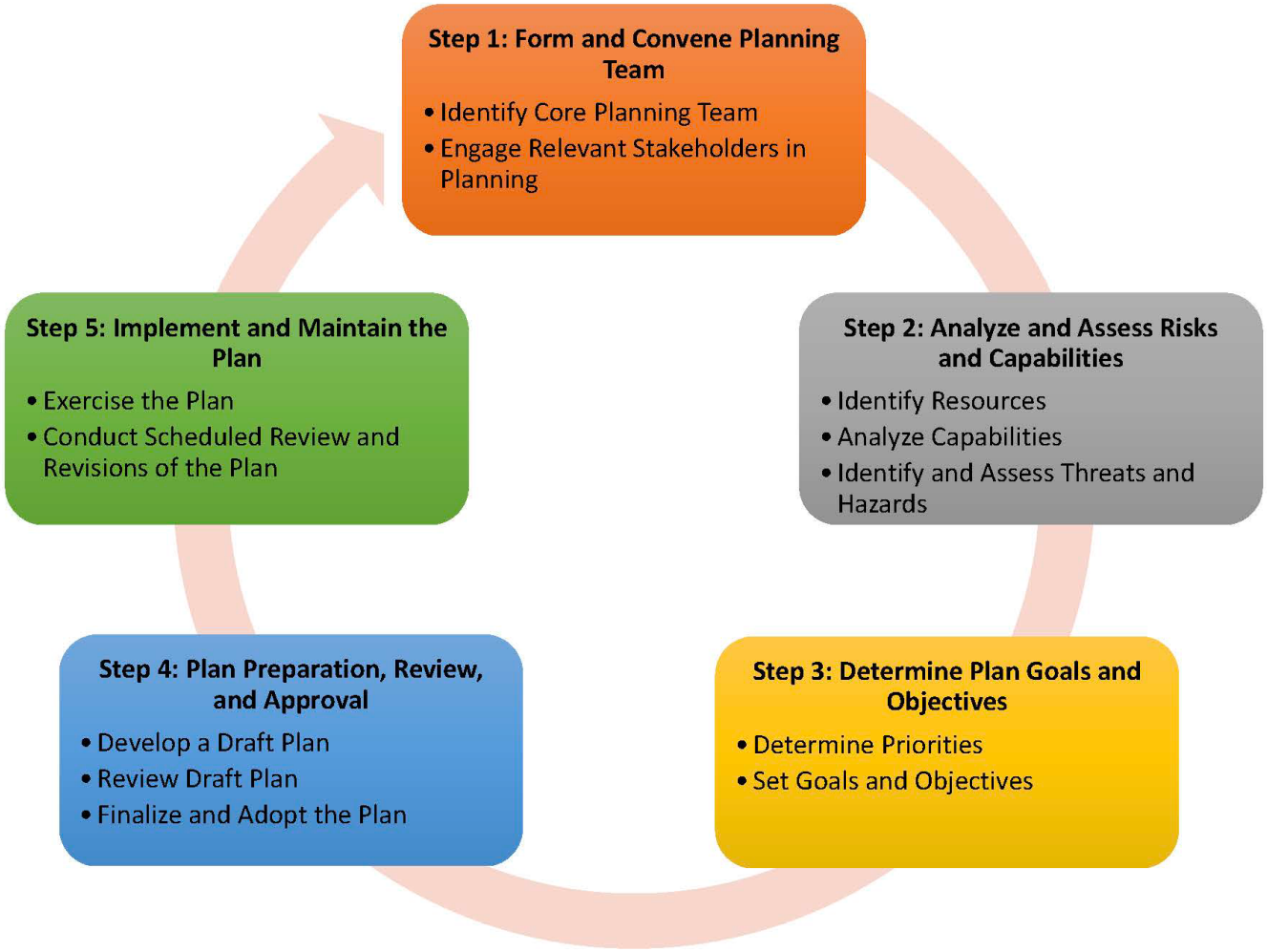
Developing a Risk Management Strategic Plan

Jeffrey R. Pillon, Director of Energy Assurance

National Association of State Energy Officials

Developing a Risk Management Strategic Plan

Figure 1. Steps in the Energy Assurance Planning Process



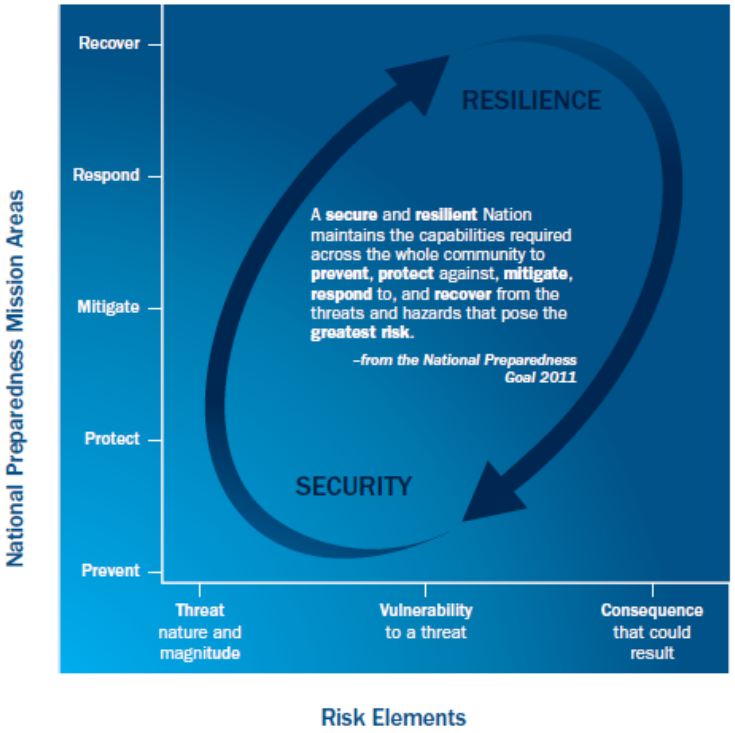
Risk – The potential for an unwanted outcome resulting from an incident, event, or occurrence, as determined by its likelihood and the associated consequences.

Risk is a function of:

- **Consequences:** If something happens, what are the human and economic impacts to society?
- **Threats/Hazards:** What can happen? What is the frequency/probability?
- **Vulnerabilities:** Are there weak links in the energy supply chain and infrastructure? Are components antiquated/old and failure prone? Are there infrastructure co-locations or bottlenecks? Why is it critical?

In the SRAP tool these generally fall under Tabs 2. Evaluating Risk and 3. Critical Infrastructure

Figure 4 – Critical Infrastructure Risk in the Context of National Preparedness



Source: NIPP 2013Partnering for Critical Infrastructure Security and Resilience

Risk Assessment

Risk is a function of

[Consequence x Threat x Vulnerability]

$15 million Rifle Attack Visible Line of Site

The April 16, 2013, assault on the Pacific Gas and Electric Company's Metcalf substation near San Jose, California damaged 17 transformers, caused $15 million in damage, and put the facility out of service for nearly a month.

U.S. DEPARTMENT OF ENERGY

State of Idaho
ENERGY SECTOR RISK PROFILE

This State Energy Risk Profile examines the relative magnitude of the risks that the State of Idaho's energy infrastructure routinely encounters in comparison with the probable impacts. Natural and man-made hazards with the potential to cause disruption of the energy infrastructure are identified.

The Risk Profile highlights risk considerations relating to the electric, petroleum and natural gas infrastructures to become more aware of risks to these energy systems and assets.

IDAHO STATE FACTS

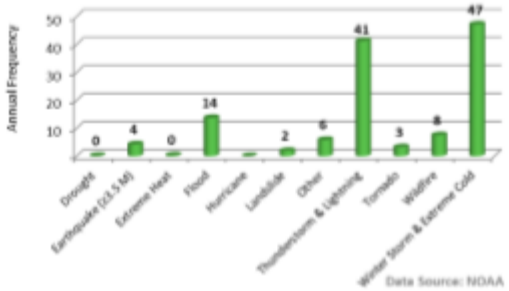
State Overview
- Population: 1.61 million (1% total U.S.)
- Housing Units: 0.68 million (1% total U.S.)
- Business Establishments: 0.04 million (1% total U.S.)

Annual Energy Consumption
- Electric Power: 23.7 TWh (1% total U.S.)
- Coal: 200 MSTN (<1% total U.S.)
- Natural Gas: 911 Bcf (4% total U.S.)
- Motor Gasoline: 16,900 Mbarrels (1% total U.S.)
- Distillate Fuel: 9,600 Mbarrels (1% total U.S.)

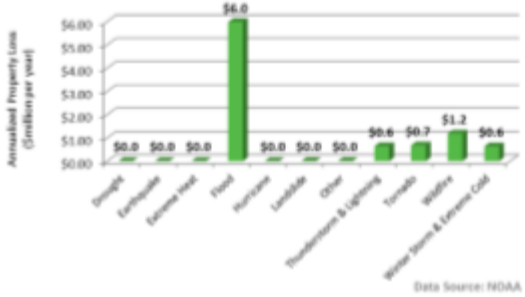
Annual Energy Production
- Electric Power Generation: 15.5 TWh (<1% total U.S.)
  - Coal: 0.1 TWh, <1% [0 GW total capacity]
  - Petroleum: 0 TWh, 0% [0 GW total capacity]
  - Natural Gas: 1.9 TWh, 12% [1.3 GW total capacity]
  - Nuclear: 0 TWh, 0% [0 GW total capacity]
  - Hydro: 10.9 TWh, 71% [2.5 GW total capacity]
  - Other Renewable: 1.9 TWh, 12% [1.1 GW total capacity]
- Coal: 0 MSTN (0% total U.S.)
- Natural Gas: 0 Bcf (0% total U.S.)
- Crude Oil: 0 Mbarrels (0% total U.S.)
- Ethanol: 1,200 Mbarrels (<1% total U.S.)

NATURAL HAZARDS OVERVIEW

Annual Frequency of Occurrence of Natural Hazards in Idaho (1996–2014)



Annualized Property Loss due to Natural Hazards in Idaho (1996–2014)

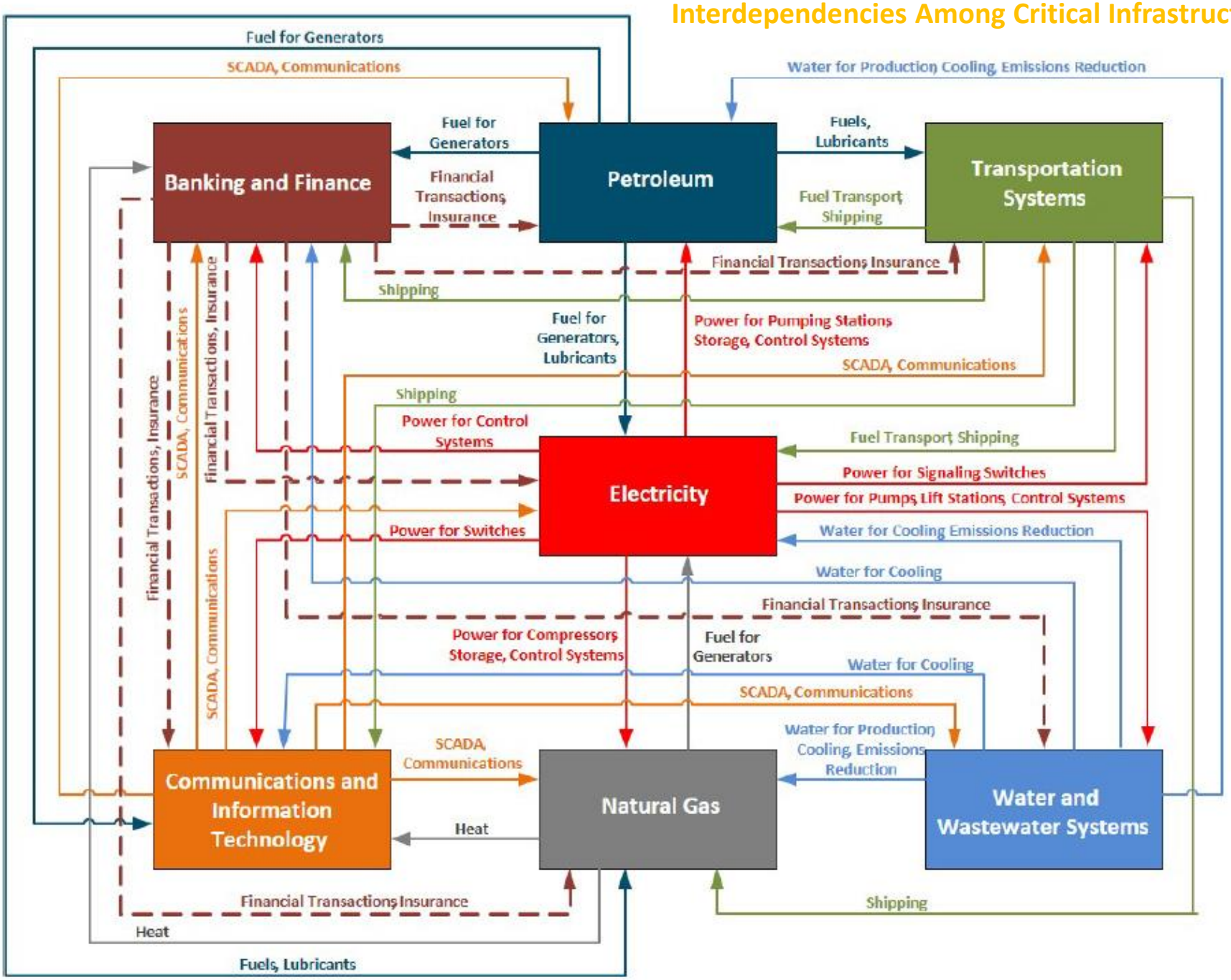


- According to NOAA, the most common natural hazard in Idaho is Winter Storm & Extreme Cold, which occurs once every 7.7 days on the average during the months of October to March.
- The second-most common natural hazard in Idaho is Thunderstorm & Lightning, which occurs once every 8.9 days on the average during the months of March to October.
- As reported by NOAA, the natural hazard in Idaho that caused the greatest overall property loss during 1996 to 2014 is Flood at $6.0 million per year.
- The natural hazard with the second-highest property loss in Idaho is Wildfire at $1.2 million per year.

Developed by the U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability

http://www.energy.gov/oe/state-energy-risk-assessment-initiative-state-energy-risk-profiles

Interdependencies Among Critical Infrastructure



Categories of Resilience-Enhancing Measures

Source: State Energy Resilience Framework J. Phillips, M. Finster, J. Pillon, F. Petit, and J. Trail Global Security Sciences Division, Argonne National Laboratory December 2016

Investments that Reduce Risks, Enhance Resiliency, Economic Efficiency, and the Environment

- Net zero energy buildings have greater self sufficiency
- Combined heat and power can reduce fuel use, improve conversion efficiency, and operate independently of the power grid
- Microgrids can supply highly-reliable power during times of natural disaster
- Alternative fuel and electric vehicles diversify energy resource usage
- Well-insulated homes and buildings that hold heat longer in a winter power outage
- Smart Grids rapidly detect the size of power outages reducing response time
- Grid modernization can reduce line losses and transmission congestion.
- Energy storage (e.g., batteries, fuel cells, and emergency fuel reserves)

Net Zero Buildings at the National Renewable Energy Laboratory in Golden Colorado

Additional Ways of Improving Resiliency

- Infrastructure hardening
- Improving efficiency
- Replacement of aging/failing infrastructure
- Physical and cyber security
- Understanding critical interdependencies
- Sustain and improving emergency response capabilities
- Increase multi-state coordination
- Utilizing new technologies
- Removing supply chain choke points
- Shortening supply chains
- Diversification of supply resources
- Continuity of business/ government operations
- Public-private partnerships
- Supporting investments in infrastructure
- Initiatives to increase local government resiliency
- Back-up generators and fuel for critical public/private facilities

Questions, discussion, observations, other ideas…..?

Jeff Pillon, Director,
Energy Assurance
Email: jpillon@naseo.org
Telephone: 517.580.7626

NASEO
National Association of State Energy Officials

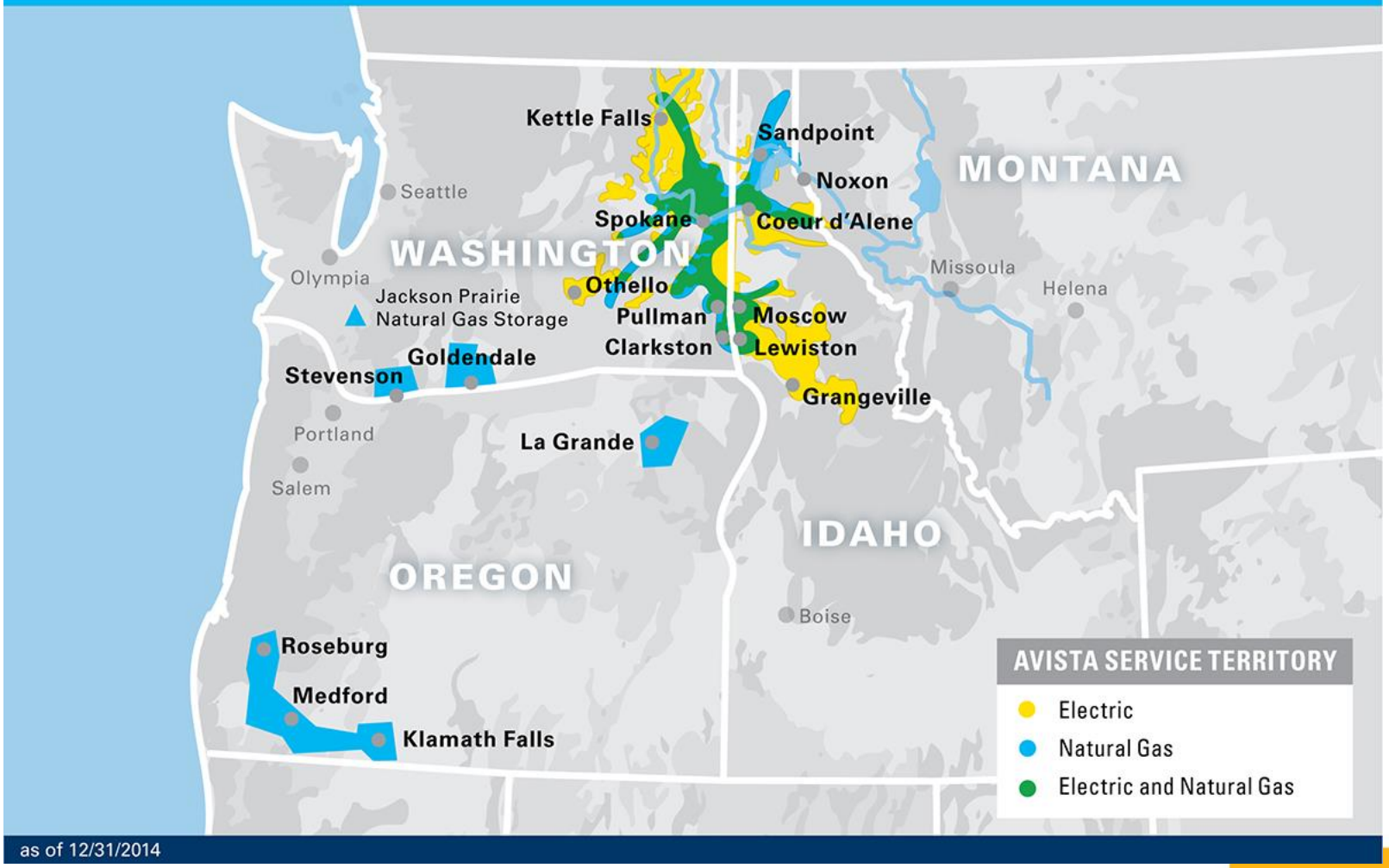
Communications During Restoration

November 16, 2019

Avista

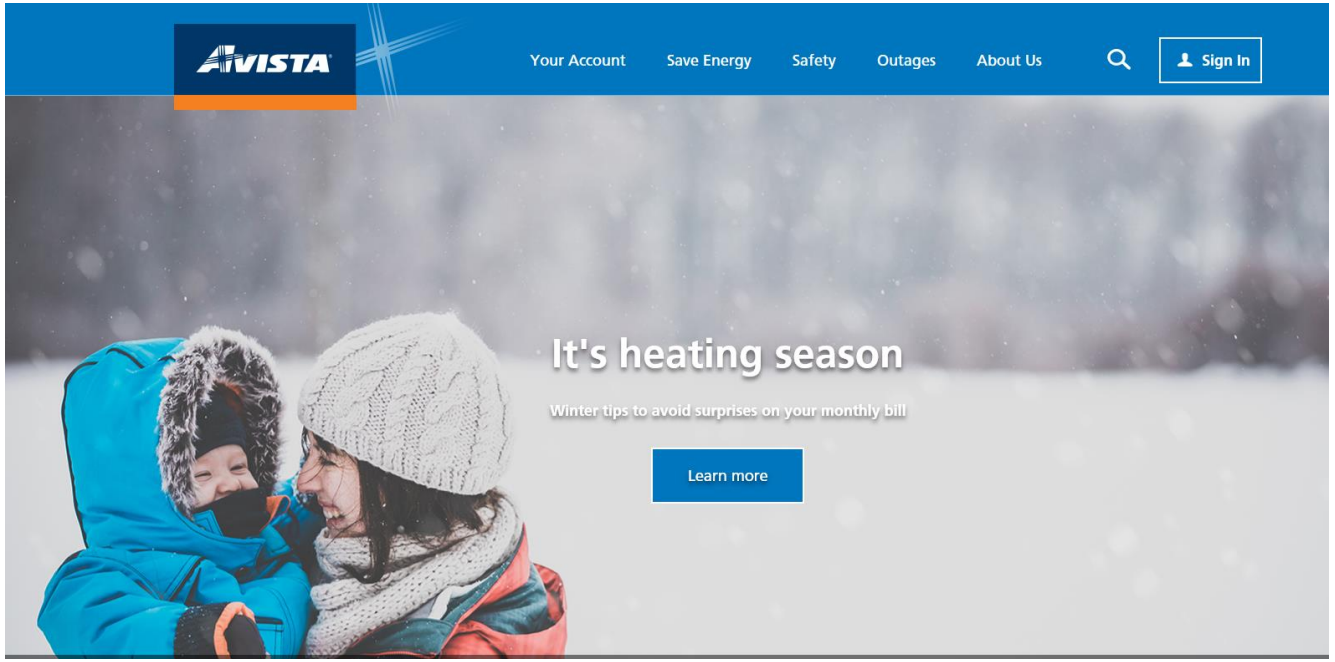
- Incorporated in the state of Washington in 1889
- Headquartered in Spokane, Wash.
- Primary business is the regulated utility
- About 1,680 employees
- Electric and natural gas service
  - 379,000 electric customers
  - 343,500 natural gas customers
- Own 75% of our generation supply

Avista Service Territory



as of 12/31/2014

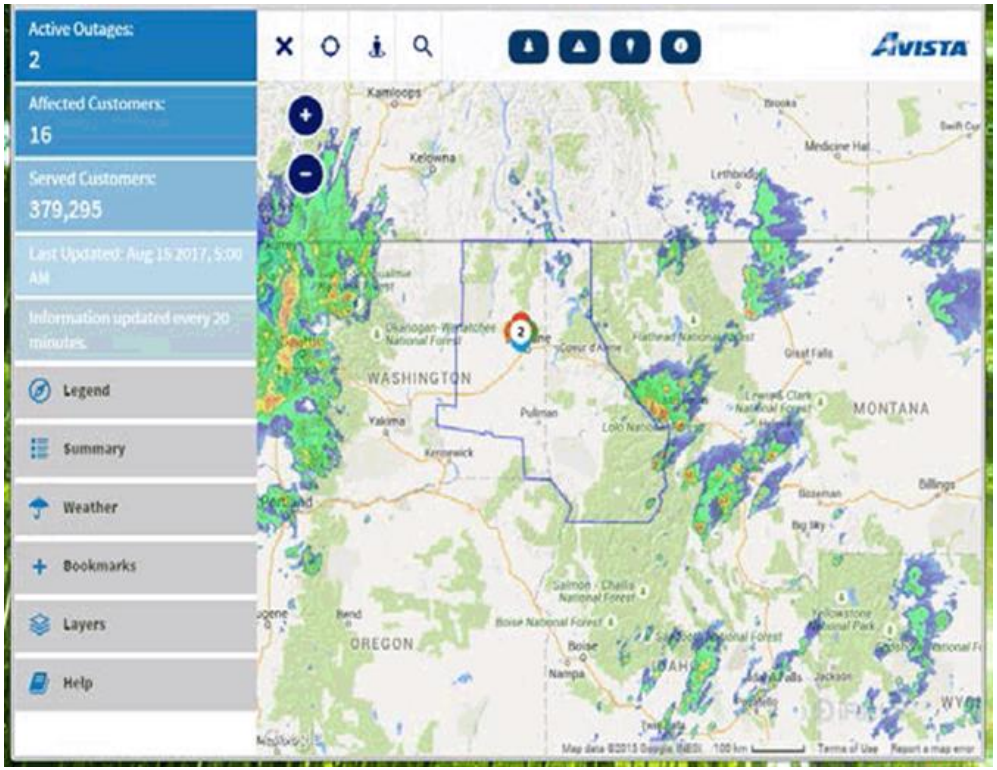
Restoration Process



Effective Coordination

Restoration Communications

Avista
Liaison Officer



AVISTA

Questions

Erin Swearingen
Avista Corp.
Enterprise Business Continuity Program Manager
Spokane, WA 99220
509-495-4981
erin.swearingen@avistacorp.com