



WILDFIRE MITIGATION AND RESPONSE PLAN

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1. EXECUTIVE SUMMARY

Over the past decade, wildfires have emerged as a significant public health and safety concern for much of the Western United States. As a result of climate change and chronic drought conditions, the risk of wildfire now extends beyond historically active areas into communities experiencing significant growth and development. While the severity of these conditions varies across the West, and even within individual states, the growing risk warrants appropriate assessment and mitigation by utilities and their regulators as well as broader community and stakeholder engagement. A comprehensive approach that mitigates wildfire hazards while maintaining the reliable delivery of energy is critical.

Safety is Puget Sound Energy's (PSE) top priority. PSE is an "all-hazards" company – our natural gas and electric systems must serve our customers through a range of weather and environmental conditions, such as high winds, flooding or earthquakes, as well as human-caused hazards such as vehicle accidents or cyber threats. Emergency preparedness and response is at the core of our services, and we view meeting the growing challenge of wildfires as an extension of that responsibility. Although wildfire response and mitigation is an existing part of our systems planning and operations, additional action steps, including the potential use of Public Safety Power Shut-Offs (PSPS), should be developed. However, before any such action could be implemented, it is necessary to have the foundational data, energy system technology, and coordination and communication processes to enable an effective response that limits the scope of de-energization to only the highest risk locations and ensures this is accomplished in partnership with state, county and local governments, public safety agencies, hospitals and other critical community assets as well as awareness and readiness with impacted customers. The disruptions and confusion prompted by the early implementation of PSPS actions in California illustrate the need for thoughtful planning and investment based on accurate data.

PSE is now evaluating what would be necessary to be able to implement an effective PSPS and where a PSPS might be used to reduce the overall risk of a wildfire in our service area. One key to that evaluation will be understanding what tools and analytics are required to understand how specific factors such as system configuration, local topography and weather interact. For example, utilities in California commonly rely on advanced networks of micro-climate weather data to give them insight into wind speeds and other indicators of increasing fire danger. At present, these tools are not part of the PSE system. Without deployment of such meteorological equipment, any preemptive actions during an emerging fire threat would likely impact a far greater geographic area than is prudent. Incorporation of such data will be critical to better anticipate and respond to future wildfires and to minimize the disruption and consequences to those beyond the most fire-impacted areas.

Likewise, in system design and planning, further analysis is required to ensure that additional hardening of the electric and natural gas transmission and distribution systems is effective in mitigating wildfire risk. Central to this analysis is understanding the two related, but distinct, facets of wildfire risk. First, there is the risk a downed wire or other equipment failure could spark a fire, and, second, there is the risk a spreading fire might damage vital energy delivery infrastructure, causing a loss of service to customers. While PSE's historical experience was that both risks were low, the September 2020 fires point to rising risks in both scenarios – with hotter, drier conditions that potentially increase the possibility of the energy delivery system either causing a fire or being damaged by a fire. To date, PSE's wildfire mitigation has primarily focused on improvements that enable the system to withstand or recover from an encroaching fire. These steps have been effective, but need to be re-evaluated in light of new trends in our regional climate and weather.

Recent wildfire actions taken by PSE (commonly referred to as "system hardening") include treating vital energy delivery assets, such as transmission poles in Kittitas County, where fires have typically occurred more frequently, with materials that will protect them from a fire as well as vegetation management along power transmission corridors. In addition, we have evaluated our construction standards, piloted alternate materials and equipment, and continue to assess where alternatives might be used for these assets in higher wildfire risk areas. Many of the measures taken to eliminate faults, such as tree trimming and tree removal, installing covered conductor (tree-wire), additional undergrounding, also benefit overall reliability, such as by reducing storm damage. Accordingly, programs and investments that target improving electric reliability for customers, if targeted to areas of higher risk, may have secondary benefits related to wildfires. Conversely, some actions that are effective at minimizing wildfires, such as configuring reclosers (which act much like a fuse or switch in a home electrical panel) to remain de-energized after a fault may negatively impact reliability.

Fortunately, many actions taken today to minimize the impact of wildfires may be unnoticed by customers or the general public. For instance, when Red-Flag Warnings are issued by the Northwest Interagency Coordinating Center and the National Weather Service, PSE takes steps to reduce the likelihood of causing an ignition. Examples include using ground or aerial patrols to inspect any transmission line prior to closing a breaker when attempting to clear a momentary fault and by increasing fire weather readiness by reconfiguring the transmission system when high winds are forecast. Operations coordination calls are also conducted to increase situational awareness and to facilitate decision making. If a wildfire event occurs, our emergency response procedures are activated and if warranted, coordination with our Gas Operations and external agencies and emergency management organizations also occurs.

Looking ahead, enhancements related to fire prevention must gain greater urgency. In doing so, development of analytical tools and processes to ensure the right actions are taken in the right locations is critical so that the investments made yield appropriate benefits to community and customer safety without causing undue degradation of service or unintended hazards, such as the loss of traffic lights, power to health care facilities and the like. Partnership and coordination at all levels of government and throughout the community are crucial. The loss of energy service is highly disruptive and poses significant hazards, from interruption of medical care and commerce to hardship among the elderly and low-income, for whom the lack of refrigeration and resulting food spoilage may pose financial challenges.

The following plan documents our current strategy for responding to wildland fires. It incorporates best practice models from risk management, operations, emergency management, communications, training and continuous improvement, with the ultimate priority being the safety of our personnel, our customers and the communities we serve.

2. WILDFIRE MITIGATION AND RESPONSE PLAN OBJECTIVES

2.1. PURPOSE

The PSE Wildfire Mitigation and Response Plan (“plan”) documents PSE’s strategy in response to wildland fires which pose a risk to our services and communities. As with all things at PSE, the plan establishes safety as the first priority and describes methods in which PSE addresses situational awareness, notification, preventative measures and response and recovery actions specific to wildfire risks.

2.2. SCOPE

PSE operates 2,400 miles of transmission and more than 10,000 miles of overhead distribution circuits, including 340,000 poles and 430 substations in Washington State.

This plan details the actions that PSE is currently performing to prevent and mitigate wildfire ignition in its service territory. It describes the steps that PSE is taking to improve the electrical system and the operational response to changing conditions in order to better manage this evolving risk. Consistent with PSE’s continuous improvement model, plan adjustments will be made periodically as new information and experience is learned from our internal stakeholders, industry partners, regulatory bodies, customers and communities.

Many internal departments at PSE are actively involved in wildfire risk mitigation efforts and have contributed information to this plan, including:

- Asset Management
- Transmission Line Design
- Standards
- Business Continuity
- System Operations
- Electric First Response
- Vegetation Management
- Municipal Relations
- Substation Operations

2.3. PRIORITIES

The priorities of this plan are as follows:

- Uphold our safety first culture for PSE employees, customers, and the general public;
- Assess the wildfire risk in PSE’s service territory; identify and prioritize higher risk assets; and develop tools that assist with operational solutions for mitigating the risk of ignition during extreme fire weather events;
- Analyze and implement mitigation solutions that balance the risk of wildfire with PSE’s mission of safe and reliable energy delivery;
- Leverage or expand existing reliability programs to deliver benefits for wildfire mitigation; and
- Develop operational processes to ensure communication with fire agencies and ensure the safety of PSE employees during an active fire event that could impact PSE’s assets.

3. PSE WILDFIRE RISK

3.1. WASHINGTON STATE FIRE ENVIRONMENT

Washington is not immune to the effects of climate change, which are projected to increase in nature over the next several decades. Summers are projected to be drier and warmer, and extreme weather events may become more likely. These conditions exacerbate the risks of wildfire ignition and spread. Changing weather patterns can shift tree pests and disease as well, causing additional fire load in forests and in the adjacent wildland urban interface (WUI).

Population increase and a growing footprint of buildings exposed to wildfire risk means that the consequence of wildfires on human populations is increasing. Human settlement and forest management practices have led to increased fire suppression activities allowing for additional accumulation of fuel.

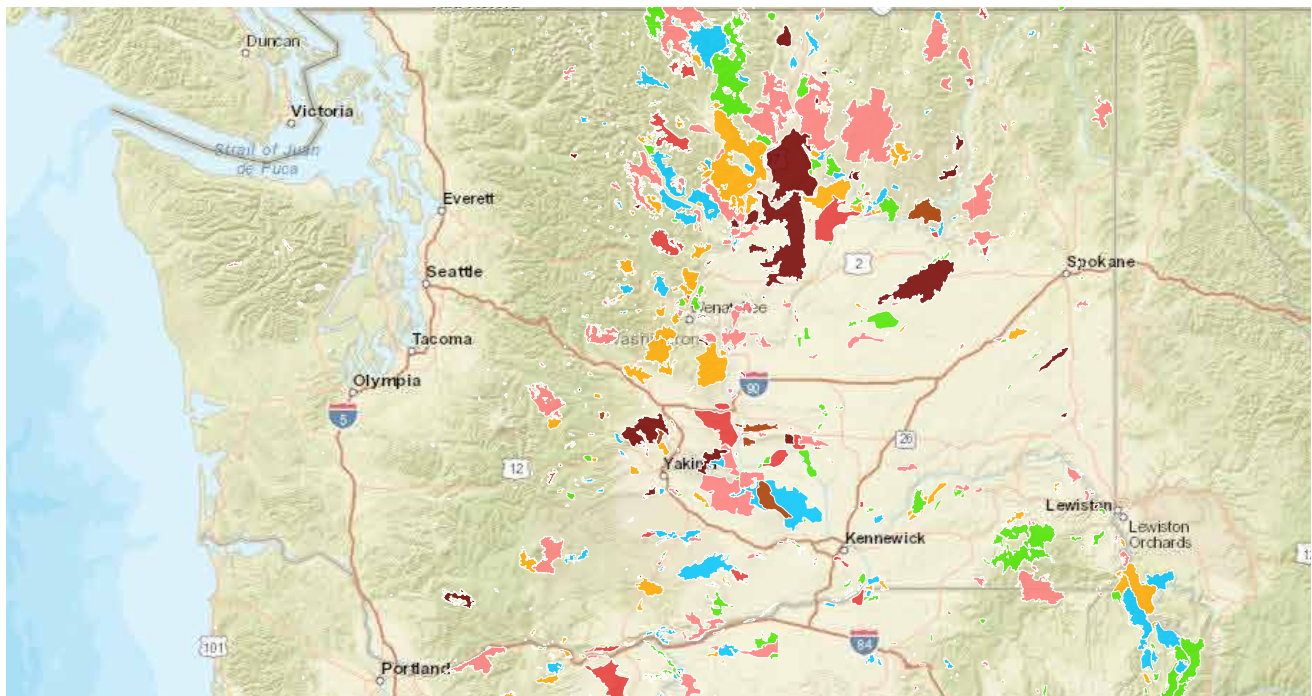
Wildfires also cause significant property damage each year and development in the WUI continues to grow.

3.1.1. HISTORICAL WILDFIRE ACTIVITY IN PSE'S SERVICE TERRITORY

The majority of PSE's electrical distribution and transmission system is located in Western Washington. PSE also operates electrical distribution and transmission systems in Kittitas County. Large wildfires in Western Washington are quite rare due to the different environmental conditions on each side of the Cascade mountain range.

These differing environmental conditions have influenced not only PSE's approach to wildfire, but also that of neighboring utilities in the Puget Sound area. PSE's asset management strategy historically has not been wildfire-centric due to the lack of fire related loss events in the majority of PSE's service territory. Winter weather traditionally has been the major driver of PSE's asset management strategy due to the damaging impact of winter wind storms.

Large wildfires west of the Cascades are rare as compared to Eastern Washington:



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NWCC Fire History

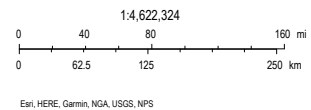
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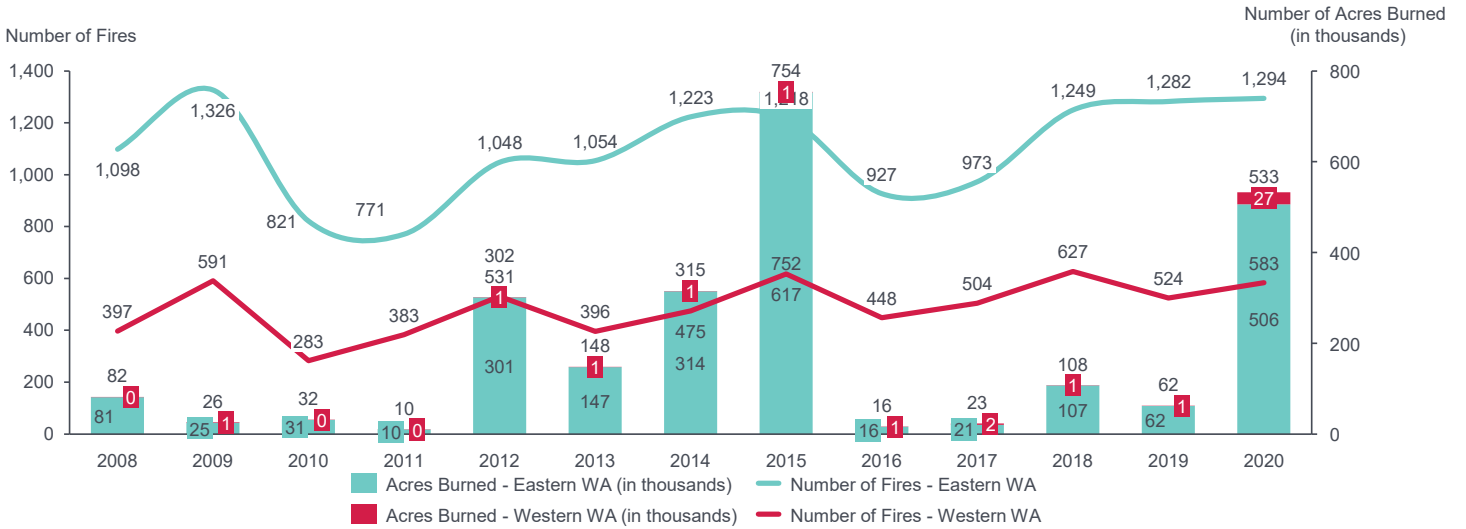


Esri, HERE, Garmin, NGA, USGS, NPS

<https://gacc.nifc.gov/nwcc/information/firemap.aspx>

Western Washington and Eastern Washington have different fire environments

Within Washington state, the number of fires and acres burned is lower in Western WA compared to Eastern WA



Note(s): Wildfires were classified according to DNR regions with the Northeast Region and Southeast Region being Eastern Washington. The Northwest Region, South Puget Sound Region, Pacific Cascade Region, and Olympic Regions were classified as Western Washington. Source(s): Washington Department of Natural Resources

Despite the historical lack of wildfire-related loss events in PSE’s service territory, recent events impacting utilities throughout the Western U.S. demonstrate that climate conditions are shifting the risk landscape, even in those areas that were not previously considered fire prone. Assessing where high wildfire risk areas exist has been a priority at PSE for several years. The first step to mitigating those risks is understanding the relative risk of a large wildfire in the different areas of PSE’s service territory.

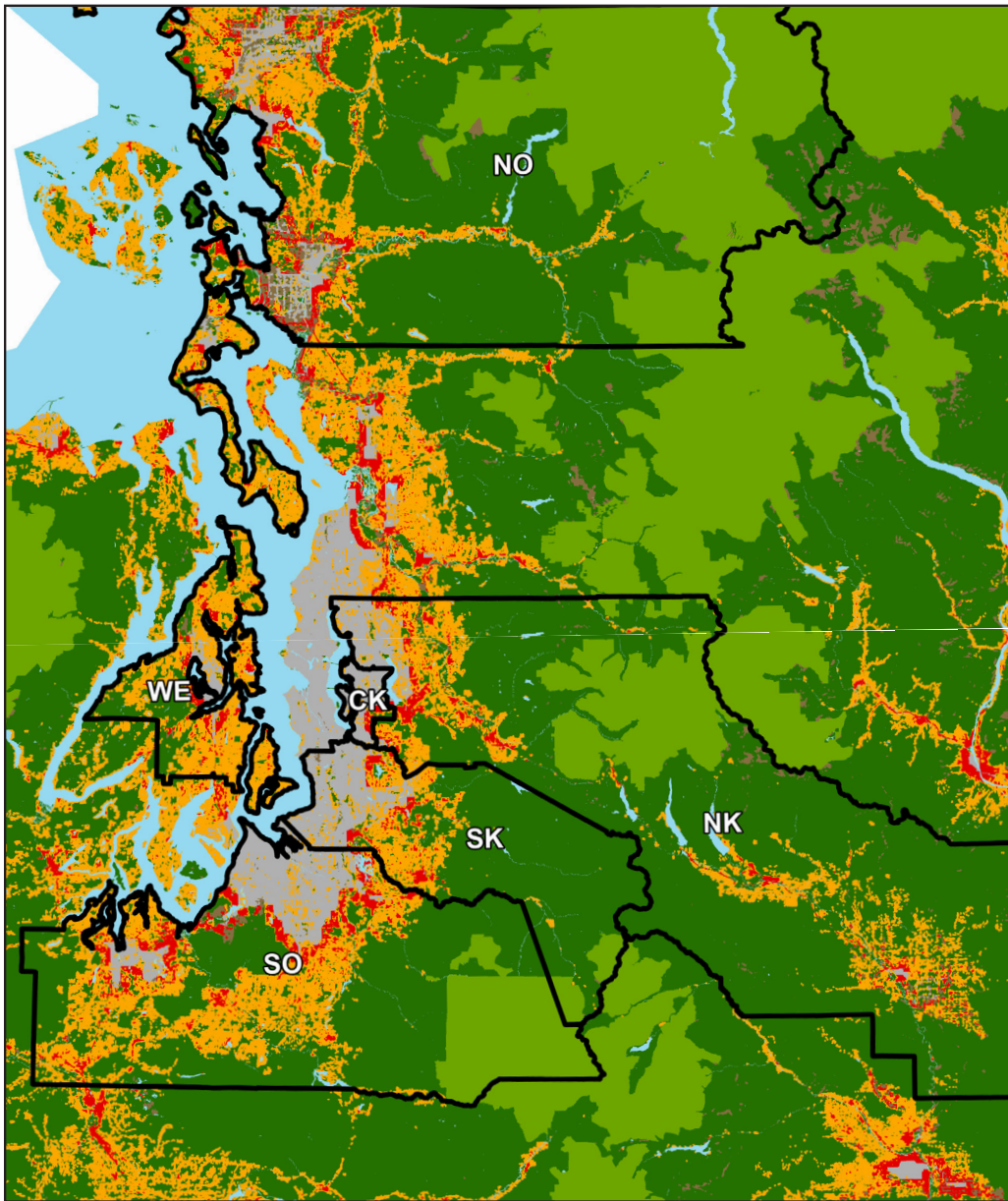
3.2. PSE RISK ASSESSMENT AND MODELING

3.2.1. WILDLAND URBAN INTERFACE (WUI)

The wildland urban interface (WUI) is the zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Communities adjacent to and surrounded by wildland are at varying degrees of risk from wildfire.

The Washington State Department of Natural Resources has identified the WUI areas in PSE's service territory:

PSE Operating Areas Overlaid with WUI



This map depicts specific areas within the WUI using the following colors:

- Water
- Vegetated Uninhabited areas
- Non-vegetated uninhabited
- Non-vegetated inhabited
- WUI – intermix
- WUI – interface
- Long-term non-buildable areas

3.2.2. PSE RISK ASSESSMENT METHODOLOGY

PSE uses several risk assessment methodologies to identify areas best suited for wildfire mitigation activities.

Double Diamond is a design process invented in 2005 by the British Design Council intended to identify and understand the core problems and then implement the appropriate solutions. It consists of four phases and is intended to be used in a non-linear, iterative way. The general problem is expanded by research and insight and then focused into a specific set of problems. The potential solutions are developed and then the solutions that work are delivered to be implemented.

During the **Discover Phase**, the process moves from the general challenge of “wildfires” to all of the risks associated with wildfire. They can be categorized as follows:

1. **Ignition** – How wildfires are initiated
2. **Propagation** – How wildfires can grow to be a danger
3. **Response** – How wildfires can be detected and what response occurs
4. **Consequence** – What are the consequence of wildfires
5. **Data** – Information and awareness of wildfire incidents on and around the PSE electrical system

In the **Define Phase**, the focus narrows into a single problem definition:

Implement a plan with elements that prioritize safety, situational awareness, preventative methods, and recovery to reduce the likelihood and impact of wildfires for customers and communities in PSE’s service territory.

The process also acknowledges that there are additional solution goals such as:

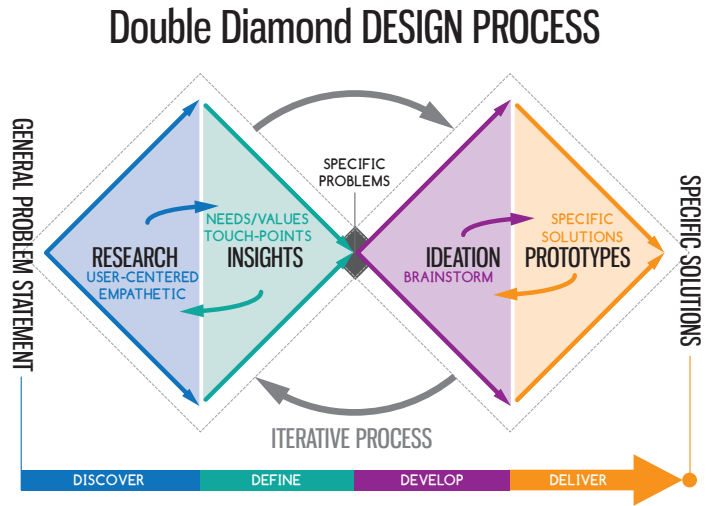
- Resiliency to wildfires from other sources
- Preventing risk to the environment

In the **Develop Phase**, the bow-tie method is used to examine risks and develop possible solutions.

Bow-tie risk methodology results in a clear differentiation between proactive and reactive risk management centering on an event of wildfire due to interaction between PSE equipment and outside sources such as vegetation.

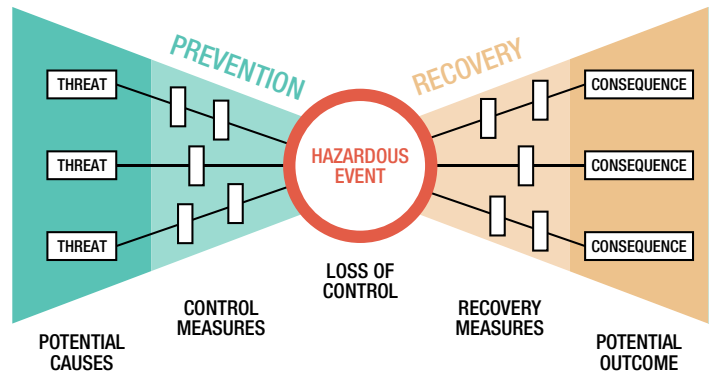
The Bow Tie Risk Assessment yields the following categories of risk mitigation objectives:

- A. System Design
- B. Enhanced Inspections
- C. Enhanced Vegetation Management
- D. Situational Awareness
- E. Operational Practices
- F. Post-Incident Recovery, Restoration and Remediation Activities
- G. Public Outreach



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In the **Deliver Phase**, from the categories of risk mitigation objectives, mitigation programs are developed to evaluate, test and implement. These programs include:

- A. Enhanced Situational Awareness
- B. Fault Reduction
- C. Fault Protection
- D. Operational Procedures and Emergency Response
- E. Communication and Outreach

Enhanced Situational Awareness: Preventing wildfires starts with awareness of the conditions that drive wildfire risks. PSE developed risk assessments of the electrical system and real-time weather conditions. Enhanced inspection technology is being explored to give a more detailed assessment of equipment condition and vegetation encroachment.

Fault Reduction: Improving reliability by reducing the number of faults also prevents the production of heating events that can cause wildfires. By prioritizing reliability programs within the wildfire risk areas, risk reduction can also be achieved.

Fault Protection: Reducing the extent of faults or the likelihood of a fault that could lead to an ignition of a fire.

Operational Procedures and Emergency Response: Leverage situational awareness into proactive actions and a coordinated and effective response.

Communication and Outreach: Effective internal and external communication is essential for coordinated prevention and response to wildfire risks. PSE works with land management groups ahead of fire season and fire response personnel during wildfire events. Customer communication follows established protocols from storms and other emergencies.

3.2.3. CIRCUIT RISK RATING

PSE's risk assessment work results in an understanding of where the risks are highest for the interaction of PSE equipment and outside sources to ignite a wildfire. In order to quantify this threat, it is important to understand how PSE equipment could be involved in an ignition resulting in a large wildfire consequence. The flow of events is as follows:

- A. **Heat:** Electrical energy is released as heat. This can be a fallen conductor, a blown fuse, a tree growing into the circuit, or stray current.
- B. **Fire Ignition:** The resulting heat reaches a combustible fuel. This can include vegetation coming into contact with a circuit, a spark landing in dry grass, a pole-top fire.
- C. **Wildfire Propagation:** The resulting fire spreads to more fuels and becomes self-sustaining. The growth of fire is dependent on fuel availability and type, dryness, wind, and terrain.
- D. **Consequence:** The resulting wildfire causes damage and injury. The consequences increase as the density of structures rises in the WUI.

When evaluating specific considerations for the flow of events listed above for PSE's system, the following characteristics of PSE's system are used to develop a specific risk model for the different portions of PSE's service territory:

Heat

The wire specification (type and size) of circuit conductors and overhead equipment has been determined to be the largest indicator of risk of equipment-caused faults. Covered conductor ("tree wire") and spacer cable are a relatively low risk to causing arc events, while smaller copper conductor represents a higher risk due to its brittleness and lower strength ratings. The various type of conductors used throughout PSE territory have been priority rated as low, medium, and high risk.

The vegetation maintenance cycle is also used to determine the risk of a vegetation contact fault. As time passes following an inspection and maintenance activity, the risk of vegetation growing or falling into a circuit increases.

Fire Ignition

PSE employs the USFS burn potential severity map to determine the risk of a spark or arc developing into a fire. More overhead exposure in these higher burn potential areas is considered to be a higher overall risk. Combining the wire specification risk and the burn potential severity gives an overall risk for an ignition which could lead to a wildfire event.

Wildfire Propagation

For a fire event to spread into a wildfire, wind and terrain/fuels are the biggest driver. The USFS burn potential map takes into account the fuel types and the terrain already, so PSE then adds several weather datasets to include the wind component.

Wind speed is a major driver of Red Flag Warnings, along with low humidity, and these two conditions are used as the trigger for operational decisions regarding how to configure the electrical system during high fire risk days.

Consequence

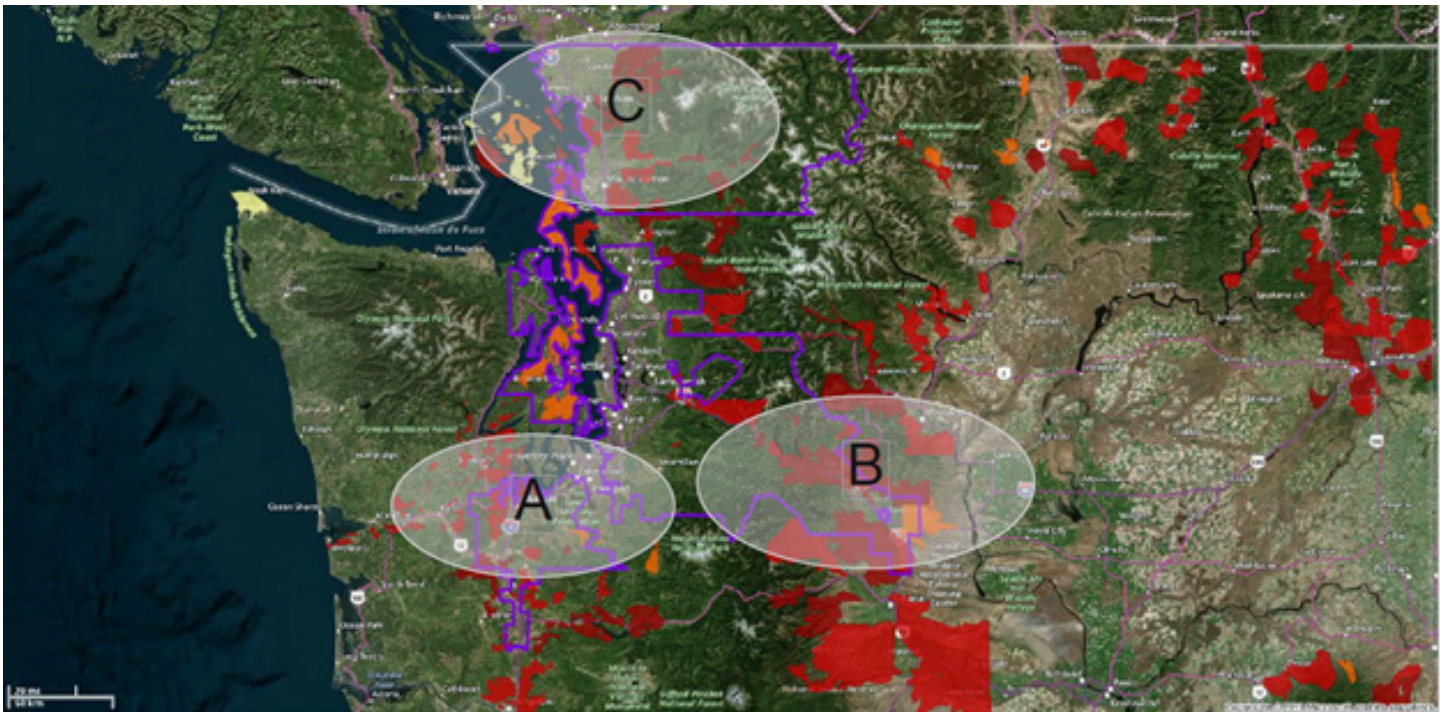
WUI is used to determine the possible consequences of a large wildfire from the perspective of threat to people and property. As development continues to increase and homes are built at the edge of and inside densely forested areas, people and structures are at increased risk of wildfire. WUI provides a relative risk rating for these areas.

The circuit risk ratings allow PSE to prioritize inspection, maintenance, upgrades, and operational protocols efficiently to reduce the overall wildfire risk. Unsurprisingly, the majority of higher risk circuits are located largely on the Eastern side of the Cascade mountains in Kittitas County – but the risk assessment also identifies some higher risk circuits located in Western Washington as well.

The circuit risk ratings take into account all of the aforementioned characteristics with weighting factors applied. Future efforts to further refine this model, adjust the weighting factors, and develop a better sense of fire spread modeling are proposed for future years. These risk characteristics are applied in a geospatial map dashboard discussed in Section 4 of this plan.

PSE has identified three areas in its service territory with the highest wildfire risk, which make up less than one percent of PSE's transmission and distribution system. These areas (A, B, and C) are depicted on the map below.

Areas with highest likelihood of wildfire risk







4. WILDFIRE MITIGATION AND RESPONSE PLAN ELEMENTS

4.1. ENHANCED SITUATIONAL AWARENESS

4.1.1. TABLE 1: ENHANCED SITUATIONAL AWARENESS

Enhanced situational awareness encompasses tools and technology that convey a comprehensive understanding of real-time wildfire risk throughout PSE’s service territory. Conducting a thorough risk assessment creates a baseline of relative wildfire risk in different geographical areas, which then serves as a backdrop for fire weather events that escalate the chances of wildfire spread.

Emerging technologies such as AI/machine learning and advanced image processing can then further refine real time risk conditions to a granular level which provides system operators with the information needed to execute mitigation actions in advance of a fire weather event.

Approach	Applications and Benefits	Implementation Considerations
Wildfire Risk Model 	Mapping wildfire risk in the vicinity of utility assets is essential to informing operational decisions for mitigating wildfire risk. PSE’s modeling approach identifies higher fire risk areas of PSE’s system using Washington Department of Natural Resources data.	Fire risk assessment is a rapidly developing field, with new technology and models being continuously developed. All fire risk modeling approaches have limitations and will generate predictions that have uncertain accuracy. PSE will continue to refine fire risk modeling as new methodology and more granular data becomes available.
Fire Weather Monitoring 	Publicly available wildfire weather forecasts can contribute to situational awareness and help utilities prepare for imminent wildfire weather conditions. Technologies that provide real time awareness of current weather serve to further inform decision making during active wildfire weather events.	Wildfire weather forecasts are typically generated for broad swaths of PSE’s service territory, which creates difficulty in identifying specific operational mitigation approaches. Real time weather monitoring stations provide more granular information but require substantial investment for sensor systems and meteorologists to interpret the data.
Enhanced Inspection Technology 	Remote sensing and imagery technologies provide valuable information about utility assets and the surrounding environment that is not available via traditional inspection techniques. PSE’s current technology evaluations include: <ol style="list-style-type: none"> 1. Infrared (IR) and thermal imaging 2. LiDAR (Light Detection and Ranging) 3. Drone deployment of IR and LiDAR vs. traditional aircraft approach 4. Satellite imagery for real time evaluation of large portions of PSE’s service territory 	IR and thermal inspections to identify impending equipment failure is a new and untested approach to early identification of failure methods. LiDAR provides very granular data, but it is expensive and data processing can take months. Both technologies are usually deployed via helicopter, which further adds to the cost. PSE is currently evaluating the viability of deploying both technologies via drone, which should improve cost efficiency. Satellite imagery combined with AI/Machine learning technology is also being evaluated; however, early offerings of this approach do not provide the granularity needed for specific operational decision making.
Pre-Wildfire Season Inspections 	Traditional inspection techniques identify short term mitigation opportunities prior to the start of fire season.	PSE conducts ground and aerial inspections of assets in high wildfire risk areas for the purpose of identifying defective equipment or encroaching vegetation that requires attention prior to fire season.

 EMERGING TECHNOLOGY OR OPPORTUNITY

 CAPITAL/O&M INTENSIVE

 IMPLEMENTATION CHALLENGES

 PARTIAL SOLUTION

4.1.2. WILDFIRE RISK MODEL

In order to give System Operators awareness of which circuits represent a higher risk for wildfires, PSE has developed a real-time dashboard to represent the distribution overhead system along with a Wildfire Hazard Potential (WHP) GIS map from the US Forest Service (USFS), which “depicts the relative potential for wildfire that would be difficult for suppression resources to contain, based on wildfire simulation modeling.” This map contains five classifications: very low, low, moderate, high and very high. For the annual dashboard, the risk is calculated as follows:

The score is from 0-5, where the circuit with the highest risk receives a score of 5. Each circuit’s score is determined by three factors: vegetation management (10%), environmental (60%), and consequence (30%). The vegetation management score is based on the cycle length and year last managed. The environmental score is determined by the length of overhead wire intersecting moderate, high, or very high burn potential areas (from USFS), and weighted by burn potential severity as well as the wire spec. The consequence score is also determined by length of overhead wire intersecting different weighted consequence risks.¹

In the future, PSE plans to incorporate the annual score as a proportion of the daily assessment to help drive operational decision making. Currently, National Oceanic and Atmospheric Administration (NOAA) Fire Weather & Dry Thunderstorms, the National Weather Service (NWS) Fire Watches & Red Flag Warnings, and the Northwest Predictive Services (NWPS) from the Northwest Interagency Coordination Center contribute to the daily assessment. NOAA and NWS both contribute 40% of the risk score, and the NWPS contributes the other 20% of the score. Risk is determined by the length of overhead wire intersecting any of the areas of concern from any of these sources, and weighted by the severity of the concern.

To prepare for the 2021 wildfire season, PSE incorporated WUI, conductor material assessments, and vegetation maintenance cycle into each distribution circuit and transmission line risk scoring. PSE has also identified where transmission and distribution systems overlap to help coordinate wildfire response efforts between the two systems.



PSE Wildfire Dashboard

1. Consequence data is 85% WUI, and 15% burn probability (dataset from wildfirerisk.org) of the land for a given year.

4.1.3. FIRE WEATHER MONITORING

PSE is leveraging both real time weather condition datasets from NOAA, NWS, and NW Predictive services, as well as datasets for WUI, burn potential, and burn probability, to provide a baseline and real time risk level for each distribution circuit and transmission line.

- United States Forest Service (USFS) – Burn Potential
- Wildfirerisk.org (USFS & NWS) – Burn Probability
- DNR – Wildland Urban Interface
- NOAA – METAR Current Wind Speeds
- NW Predictive Services – Fire Potential
- NWS – Fire Weather Watches & Red Flag
- NOAA – Fire Weather & Dry Thunderstorms

4.1.4. ENHANCED INSPECTION TECHNOLOGY

PSE is currently evaluating several emerging technologies and the possible application for wildfire mitigation purposes.

- Aerial inspection methods such as LiDAR are common in the utility industry already, but these methods are usually leveraged for vegetation management and engineering activities. LiDAR can be a valuable tool, but it has been expensive, typically requires the use of an aircraft and the associated data processing is often time consuming.
- Thermal/IR inspections have the potential to identify failing insulators by picking up heat signatures or coronas from electricity tracking from conductors to other parts of the structure. This technology is very new, and it is also aircraft-based, which makes it expensive.

In order to address the challenges of aircraft deployment and data processing time, PSE has used a drone capable of carrying LiDAR, Thermal/IR, and HD camera packages. This drone combined with a data processing solution pared down to an “a la carte” approach for the particular application of data collection greatly reduces the cost of inspections and speeds up data processing time. Additionally, it will allow repeatable and routine data collection for the purposes of developing growth models to further improve prioritization and increase situational awareness in higher fire risk areas.

LiDAR/IR/HD Camera drone compared with normal 8 MP camera drone



Finally, PSE is currently evaluating the use of satellite imagery combined with machine learning/artificial intelligence, which enables quick, relatively inexpensive assessments of large portions of PSE's system (thousands of miles at a time). This technology is advancing very rapidly, and while image quality just a few years ago did not have the granularity for wildfire mitigation purposes, the newest offerings have accuracies of less than a foot and they are continually improving. Additionally, the satellite cameras use color spectrums not visible to the naked eye, which can identify trees stressed by drought before an inspecting arborist will be able to detect a change in the foliage of the tree.

4.1.5. PRE-WILDFIRE SEASON INSPECTIONS

PSE conducts several types of inspections on higher risk areas prior to the start of wildfire season (generally accepted in Washington state as July 1). These inspections are planned by PSE Asset Management, and executed by PSE's Electric First Response and Vegetation Management groups. These inspections are conducted with the purpose of identifying and mitigating imminent concerns prior to fire season.






Qualified electrical workers and certified arborists conduct these inspections primarily from the ground, and sometimes aerially, for hard to reach areas, such as PSE's cross-country transmission lines. Any equipment issues found are submitted to PSE's Engineering department, and any imminent concern is addressed on an emergency basis. Other longer term issues are routed through PSE's normal asset management and replacement processes. Any vegetation that is suspect to grow or potentially fall into conductors is trimmed or removed as well.

4.2. FAULT REDUCTION

4.2.1. TABLE 2: FAULT REDUCTION

Fault protection strategies are designed to prevent the interaction of utility infrastructure and the environment. Factors such as tree growth or animals can short circuit electrical equipment and lead to outages with arcing events. Equipment failure can be an ignition source in a number of different ways.

A successful wildfire mitigation plan will incorporate a variety of fault reduction strategies tailored to the wildfire environment of individual utilities.

Approach	Applications and Benefits	Implementation Considerations
Enhanced Vegetation Management 	Vegetation Management activities targeted specifically at wildfire prevention can reduce limb and tree caused faults. Pre-fire season inspections identify vegetation that may encroach on conductors during the summer growing season. Targeted off right-of-way tree removal provides benefits for both fire mitigation and reliability.	Enhanced Vegetation Management can be costly, and it is impractical to completely eliminate all vegetation caused outages. Off-cycle inspections and trimming can address the issues created by fast growing “cycle buster” trees under conductors. Emerging technology may provide opportunities to use imagery analysis for identification of declining trees that are not apparent to the naked eye. PSE is also exploring other technology alternatives that leverage AI and machine learning to predict areas that are at risk of tree related outages.
Covered Overhead Conductors 	Covered conductors (tree wire) can reduce faults from limbs and animals. Tree wire has less probability of arcing when contacted by external sources as compared to bare conductor.	PSE has a mature program to replace bare conductor with tree wire for the purposes of improved reliability. This program can be leveraged to focus on higher wildfire risk areas for the prevention of arcing events that could lead to an ignition.
Strategic Undergrounding 	Underground lines are not likely to trigger a wildfire event, unless there is an equipment failure in an access enclosure or above ground transformer.	Undergrounding lines can greatly reduce the chance of an outage caused by external sources such as trees or animals. However, undergrounding is extremely costly and any implementation of this strategy would require a focused approach on only the highest risk wildfire areas in PSE’s service territory.
Asset Management 	PSE’s asset management approach for reliability purposes offers additional benefits for wildfire mitigation.	Traditional asset management strategies for reliability have been based on increasing reliability and hardening of PSE’s system against winter storms. Historically, PSE has not suffered fire-related losses that would justify significant system hardening efforts from a wildfire risk perspective.
Public Safety Power Shutoffs (PSPS) 	De-energizing electrical systems can prevent ignition events. PSE selectively de-energizes lines during higher risk periods such as Red-Flag Warnings where doing so does not impact delivery of electricity to customers.	PSPS is an extremely complicated mitigation strategy for wildfire. It requires an enormous amount of planning and communication, and can result in extended outages for customers.

 **EMERGING TECHNOLOGY OR OPPORTUNITY**

 **CAPITAL/O&M INTENSIVE**

 **IMPLEMENTATION CHALLENGES**

 **PARTIAL SOLUTION**

4.2.2. ENHANCED VEGETATION MANAGEMENT

PSE conducts pre-wildfire season vegetation inspections and any follow-up work prior to July 1 each year. These inspections are conducted on the highest wildfire risk distribution circuits and transmission lines as identified by PSE's most recent risk assessment for wildfire. Any trees that could encroach on live conductors during the summer growing season are trimmed back to ensure clearance from conductors for the entire growing season. In early 2021, PSE also focused on hazard tree removal for the pre-wildfire season vegetation inspection and remediation by targeting removal of 250 hazard trees on the distribution circuits and transmission lines. As of July 1, 2021, these 250 hazard trees have been removed. Conducting annual inspections on distribution circuits augments PSE's standard vegetation management practices for reliability, and it is focused on the upcoming wildfire season and on the highest risk distribution circuits. Distribution circuits have vegetation management conducted every 4 or 6 years (4 years for urban areas, 6 for rural areas) for reliability purposes, and the vegetation inspection is done at that time. Annual inspections in higher wildfire risk areas exceeds historical practices.

Additionally, prioritizing the removal of hazard trees in higher wildfire risk areas is approached differently than PSE's normal historical practices for hazard tree removal. From a reliability focused perspective, this activity is typically targeted at the areas of PSE's service territory that have the most tree related outages, which would be on the West side of the Cascade mountains, where wildfire risk and tree related outages correlate well. PSE's assets in Eastern Washington typically perform well from a tree related outage standpoint as compared to the rest of PSE's system. Therefore, targeting hazard tree removal in Eastern Washington on a regular basis to reduce wildfire risk differs from PSE's historical practices and is above and beyond previous and proposed tree watch programs focused on reliability. Areas of concern for vegetation management are the higher risk wildfire areas identified by PSE's wildfire risk model. These areas include not only Eastern Washington, but some areas west of the Cascade mountains where there are a significant amount of people and structures in the WUI.

The vegetation management risk in these areas differs between Eastern and Western Washington. Eastern Washington is more sparsely treed than Western Washington, but it has more days with elevated fire weather conditions. Additionally, Eastern Washington experiences more wind in the summer than Western Washington, which generally translates to a higher wind threshold for tree failure.

Because of the different environmental conditions between these two areas of PSE's service territory, the vegetation management risks are different. Eastern Washington has less risk of whole tree failure simply because of the reduced exposure and also because of the wind hardening effects of the trees that are in the vicinity of PSE's system. Western Washington has many more trees in proximity to the lines, and whole tree failure along with limb outages are not only more common than in Eastern Washington, but also much more difficult to mitigate due to the density of the utility forest.

From an annual inspection and off-cycle trimming perspective, the risk mitigation approach to these two areas of PSE's service territory is the same: inspect higher wildfire risk areas and trim or remove any tree that poses a risk of growing into the conductors in that year. Where risk mitigation approaches will differ is in the hazard tree approach and funding prioritization given to the two areas. PSE balances the level of effort with respect to hazard tree removal between Eastern and Western Washington relative to the risk.

4.2.3. COVERED OVERHEAD CONDUCTORS

Overhead covered conductors (known as tree wire) are used by PSE to address reliability issues typically caused by tree limbs and animals. Tree wire has a layer of insulation thick enough to prevent many external contacts from arcing and causing a fault. Tree wire has been used effectively to reduce faults across PSE's territory. Spacer cable is a more robust coated overhead conductor with more compact construction that also prevents faults from external contacts. However, spacer cable has been used less frequently for solving reliability issues as PSE has had limited experience with it, and it is purported to be more difficult to install and maintain. Currently, spacer cable is reserved for situations with unique circumstances that are not well suited for tree wire or other solutions.

Like other reliability improvement projects, covered conductor projects are evaluated on multiple dimensions, including reliability improvement and safety, including wildfire risk, to determine an overall benefit-to-cost ratio that is used to compare to other projects for funding. Estimating the benefits covered conductors provide in reducing the risk of faults in higher wildfire risk areas, especially where there might be a low probability of a fault but a large potential impact of the fault, is ongoing. With few past wildfire events to evaluate, assessing risk is more difficult than with much more common wind events.

4.2.4. STRATEGIC UNDERGROUNDING

Converting portions of the overhead distribution system to underground is a solution that has been primarily used to improve reliability in areas where other solutions will not work. As underground solutions generally cost 3 to 10 times as much as overhead solutions, they are normally used in places where benefits are high enough to offset the increased costs.

Underground portions of the system see fewer faults than overhead portions because they are far less likely to be damaged by vegetation, which is the leading cause of faults in PSE's service territory. Underground lines have less exposure to many of the animals that cause outages as well. Because underground conversions reduce faults relative to both wildfire and wind events, these conversions likely will be most cost effective to implement where there is a higher risk of both, but may also be justified in areas where the risk of either is the greatest.

4.2.5. ASSET MANAGEMENT

All electric transmission and distribution system capital improvement projects and programs are evaluated in a benefit-to-cost analysis, which may include a risk assessment depending on the nature of the project or program. PSE uses its Investment Decision Optimization Tool (iDOT) to quantify benefit-to-cost ratios, compare investment options and optimize project portfolios. The benefit-to-cost ratios consider multiple dimensions, such as reliability improvement, safety and risk, all of which are quantified and converted into a net present value for each project.

As storms and other weather events are the primary cause of damage to PSE's systems, programs that improve resilience to weather events historically have been the main focus of hardening improvements, though some of those improvements provide benefits for wildfire resilience as well. The costs and benefits for projects that prevent or enhance resiliency against wildfires are difficult to quantify given so few wildfire events have occurred in PSE's territory. While benefit-to-cost estimates have been developed for funding decisions, more work is necessary to improve confidence in the estimates. As new projects are tested and more field experience is gained with existing implementations, accuracy in benefit estimates will increase, resulting in a better optimization of hardening solutions and management of wildfire risks.

4.2.6. PUBLIC SAFETY POWER SHUTOFFS (PSPS)

Background

Over the last decade, California, as well as much of the Western United States, has experienced increased, intense, and record-breaking wildfires. These fires have resulted in devastating loss of life and billions of dollars in damage to property and infrastructure. Electric utility infrastructure has historically been responsible for less than ten percent of reported wildfires; however, fires attributed to power lines comprise roughly half of the most destructive fires in California's history. In response, an effort to reduce the risk of fires caused by electric infrastructure was developed involving temporarily turning off power to specific areas, which is called a Public Safety Power Shutoff (PSPS). However, a PSPS can leave communities and essential facilities without power, which brings its own risks and hardships, particularly for vulnerable communities and individuals.

History of PSPS in California

In 2012, the California Public Utilities Commission (CPUC) gave electric utilities the authority to shut off electric power in order to protect public safety. This allows the energy companies (San Diego Gas and Electric, Pacific Gas and Electric, Southern California Edison, Liberty, Bear Valley and PacifiCorp) to shut off power for the prevention of fires where strong winds, heat events, and related conditions are present.

In 2017, fires raged in Santa Rosa, Los Angeles, and Ventura, making it one of the most devastating wildfire seasons in California's history. In response to the 2017 wildfires and Senate Bill 901, the CPUC revised earlier guidelines on the de-energization of power lines and adopted the current set of PSPS guidelines in 2020 with provisions for COVID-19 measures.

The current PSPS guidelines in California direct the electric utilities to more actively and holistically take into account the needs and input of the Access and Functional Needs (AFN) community, including vulnerable populations and current and potentially eligible medical baseline customers.

PSPS Planning

There are many considerations and requirements in developing an effective PSPS plan, as the impacts are far reaching. De-energization can cause significant disruption to health care and long term care facilities, communications, internet service, wastewater treatment, drinking water supply, irrigation and firefighting resources, traffic control (which can effect egress during a fire) and other critical needs.

Triggers for a PSPS must be granular enough to limit the impacts and must consider the consequence of an ignition, not just the potential for an ignition. Eliminating the possibility of an ignition is impractical. Accordingly, the California investor-owned utilities (IOUs) have invested millions of dollars in the past decade developing tools to monitor and predict micro weather, understand fuel loading and conditions on the ground, and look for smoke and other evidence of an ignition through fire spread modelling and camera networks. The models that have been developed use a multitude of data sets to run thousands of simulations every day, using super-computing, to determine whether de-energization of a transmission line segment or other facility is warranted.

The 2019 PSPS events conducted by the three IOUs in California caused customer confusion, anger, and resulted in some customers, including medical baseline customers, not being notified of the PSPS. As such, a thoughtful PSPS plan must include community outreach, coordination and education, along with communication plans to ensure that as much notification as possible is provided to alert customers, particularly those in vulnerable communities, of an impending PSPS event.

Another important consideration is the fact that re-energization following the weather event is not immediate. This is why it is critical to be targeted and granular with the implementation of any PSPS. The potential for damage to overhead lines and facilities while de-energized still exists and must therefore be inspected in its entirety before the de-energized lines and facilities can be safely re-energized. This is a labor intensive task that takes significant time, which can result in lengthy outages.




Although PSE does not currently have the data and information, nor the sophisticated tools to effectively implement PSPS at this time, PSE will be evaluating what would be necessary to be able to implement an effective PSPS and where a PSPS might be used to reduce the overall risk of a wildfire in its service area based on the specifics of the system topography, geographic area, and communities at risk. This would also require broader community, stakeholder and customer engagement prior to any plan being finalized or implemented. At this time, PSE is not intending to use PSPS as a wildfire mitigation tool.

4.3. FAULT PROTECTION

4.3.1. TABLE 3: FAULT PROTECTION

Fault reduction strategies are intended to prevent normal operation of utility fault protection equipment from igniting dry grass or vegetation during fire weather events. Automatic reclosing schemes are essential for the fast restoration of service, but can also result in arcing events in isolated cases.

As the utility industry adapts to a changing wildfire environment, manufacturers are also developing new equipment that is designed to operate in a manner that will not cause arcing or otherwise be a source of ignition for wildfires. Much of this technology is relatively new but may present opportunity for risk mitigation in specific applications.

Approach	Applications and Benefits	Implementation Considerations
Reclose Blocking 	Preventing the automated reclosing of protective devices after a fault reduces the risk of arcing.	Turning off reclosing can result in wider spread outages that take longer to restore. Enabling reclose blocking from PSE's control center requires the installation of remote operating capability at substations.
Expulsion fuses 	Expulsion fuses avoid sparking and hot metal in contact with ground vegetation, which can be experienced with standard fuse designs.	Fire safe fuses are a relatively emergent technology. They are not in widespread use, and can have unintended impacts to the protection scheme of a circuit. In some cases fire safe fuses can interrupt or prevent other protective devices from operating.
System Design 	There are system design approaches that may provide benefits for wildfire mitigation: <ol style="list-style-type: none"> 1. Non-mineral oil transformers with higher smoke point. 2. Insulator bonding to prevent stray current heating metallic components. 3. Pole wraps can reduce the likelihood of pole failure during a fire. 4. Fiberglass cross arms are less likely to break. 	PSE is currently investigating the use of these approaches through several pilot projects in higher wildfire risk areas. The cost/benefit ratio needs to be carefully evaluated when determining where to place projects.

 **EMERGING TECHNOLOGY OR OPPORTUNITY**

 **CAPITAL/O&M INTENSIVE**

 **IMPLEMENTATION CHALLENGES**

 **PARTIAL SOLUTION**

4.3.2. RECLOSE BLOCKING

By turning off reclosing at the substation circuit breaker, the circuit can be configured to operate in fire protection mode rather than reliability mode. Reclose blocking prevents the immediate restoration attempt and possible secondary fault. Line crews are dispatched to visually inspect the circuit before re-energization. Only after a line is declared to be in the clear is the circuit re-energized.

4.3.3. EXPULSION FUSES

The expulsion power fuse interrupting rating greatly exceeds that of conventional distribution cutouts that use a fuse tube and link design, and it considerably reduces the hazards and noise of the violent exhaust common to cutouts under fault interrupting conditions. The expulsion power fuse, employing the use of a calibrated silver element, boric acid for its interrupting media and rod mechanism for arc extension, creates low arcing voltage and mild exhaust during fault interruption.

Under normal conditions, the fusible element's temperature is well below its melting temperature and does not melt. When a fault occurs that is large enough to melt the fuse element, an arc is initiated and elongated by the unit's spring, pulling the arcing rod up into the boric acid interrupting media. The heat produced decomposes the boric acid liner inside and produces water vapor and boric anhydride, which helps to de-ionize the arc. The by-products extinguish the arc at a natural current zero and exit out the bottom of the fuse.

4.3.4. SYSTEM DESIGN

Replacing mineral oil transformers with FR3-filled units can severely reduce the chance of catastrophic failure and fire. FR3 has a flash and fire point of 330°C and 360°C respectively – more than twice that of mineral oil. FR3 is self-extinguishing and will not continuously burn if ignited.

Leakage current tracking along insulators can cause heating at the point where wood cross arms attach to wood poles. Replacing the cross arm with fiberglass can block this leakage current and prevent pole-top fires. In a similar vein, bonding the base of transmission insulators to ground prevents leakage current from reaching the pole and safely shorts out flashover voltage.

5. OPERATIONAL PROCEDURES AND EMERGENCY RESPONSE

5.1. RESPONSE OPERATIONS AND COORDINATION

When a wildfire or WUI fire incident is anticipated or has entered an area in which PSE service equipment is located, PSE's Response Operations and Coordination protocols will commence.

5.1.1. CONCEPT OF OPERATIONS

PSE's Energy System Restoration Plan (ESRP) is the base plan document for gas and electric emergency response procedures, and it incorporates the use of recognized Incident Command System principles. The ESRP standard plan elements apply to any emergency regardless of cause, in which emergency response activities are required. The Wildfire Mitigation Plan Operational Procedures for emergency response augments the basic response elements contained within the ESRP, and instead builds on those elements by adding unique actions necessary to respond to a wildland/WUI incident.

5.1.1.1. Responsibility

Electric System Operations within PSE has the authority for operational response activities in response to wildfire incidents that pose a risk to PSE's electric infrastructure. Electric System Operations in consultation with the Director, Electric Operations shall activate the wildfire plan elements based on risk thresholds and available fire risk data.

5.1.1.2. Response Priorities

PSE's response priorities in the event of a wildfire incident are as follows:

- Safety of PSE personnel and communities
- Stabilization of PSE infrastructure
- Preservation of property

5.1.1.3. Situational Awareness

Electric System Operations is responsible for monitoring weather-related information on a daily basis throughout the year, including weather information related to wildfire risk. When a risk falls within prescribed action thresholds, Electric System Operations will share information as prescribed within this document, in order to ensure response readiness.

PSE uses the following sources to monitor wildfire activity:

- National Weather Service Seattle: <https://www.weather.gov/sew/>
- National Weather Service Spokane: <https://www.weather.gov/otx/>
- Northwest Interagency Coordination Center: <https://gacc.nifc.gov/nwcc/>
- PSE Wildfire Dashboard
- Washington State Department of Natural Resources Burn Risk Map: <https://burnportal.dnr.wa.gov/>
- Washington State Incident Information Map: <https://inciweb.nwccg.gov/?state=49>

5.1.1.4. Activation Thresholds

The following fire weather conditions warrant the activation of this plan when a wildfire risk is within a PSE service area or threatens encroachment within a PSE service area.

- **Fire Weather Watch:** Issued to alert fire officials and firefighters of potentially dangerous fire weather conditions within the next 24 to 36 hours. A Fire Weather Watch will turn into a Red Flag Warning 12-24 hours before the forecasted fire weather conditions are expected to occur.
- **Red Flag Warning:** Issued to alert fire officials and firefighters of potentially dangerous fire weather conditions within the next 12 to 24 hours.
- **Fire Weather Watch or Red Flag Warning with forecasted wind gusts in excess of 50 MPH:** High winds in combination with low humidity and dry fuels may warrant very conservative decision making when considering actions to prevent a fire ignition event.

5.1.1.5. Notification

Electric System Operations will contact the Director, Electric Operations as soon as possible when fire risk activity is anticipated to or is occurring within PSE's identified higher risk locations. Following notification to the Director, System Operations will coordinate an operational readiness conference call to determine appropriate actions and will include leadership decision-making representation from the following:

- Electric Operations Leadership including System Operations, Substation Management and Electric First Response
- Load Servicing Operations Leadership
- Gas Operations Director
- Emergency Coordination Center Director
- Corporate Communications Director

Following the operational readiness meeting, System Operations will provide an internal situation status bulletin using the wildfire distribution list in order to support situational awareness. Depending on the urgency of the situation, a situation briefing conference call may be held in lieu of the electronic bulletin.

5.1.1.6. Emergency Coordination Center (ECC) Activation

Electric System Operations may elect to activate the ECC to support wildfire response activity. Standard protocols for opening and operation of the ECC apply.

5.2. EXTERNAL COORDINATION

5.2.1. EXTERNAL COORDINATION

PSE's Business Continuity and Emergency Management Department has long-standing, established relationships with emergency management agencies throughout our system, including agencies at the city, county and state level. These relationships extend to fire departments and regional authorities as well.

During an emergency event, PSE communicates with these agencies through situation reports. Agencies have been provided emergency phone numbers as well as the PSE Emergency Coordination Center phone number. Additionally, PSE's Government Relations, Municipal Relations and Business Services organizations respond to questions as needed.

Prior to an emergency event, PSE participates in various emergency planning and coordination meetings, including seasonal readiness meetings, serving on county and state emergency committees, participating in exercises, after-action debriefs and improvement planning meetings. PSE's Business Continuity and Emergency Management Department also participates in industry emergency response and mutual aid committees through the Edison Electric Institute (EEI) and the Western Electric Institute (WEI). PSE is also a member of the Western Region Mutual Assistance Group (WRMAG).

5.2.2. FIRE COMMAND INTERFACE

When a wildfire has the potential to impact PSE infrastructure, Electric System Operations may elect to position a PSE Operations Section Chief and Deputy Chief near the fire service command post in order to maintain situational awareness and coordinate with fire service personnel, if needed. If the decision is made to activate these resources, the following actions should occur:

1. Determine which agency has oversight of fire command. When a wildfire is on federal or state lands, the Department of Natural Resources (DNR) assumes authority for fire command. When a WUI lies within jurisdictional boundaries, the regional authority or local fire agency assumes incident command. The DNR and county emergency management can provide command information.
2. Once known, determine the location of the fire command post and the location where PSE personnel should locate;
3. On arrival, the PSE Operations Chief should introduce themselves to the Incident Commander or Fire Operations Section Chief to exchange contact information;
4. Determine the time and location of the morning operational briefing and attend meetings to maintain situational awareness; and
5. Coordinate with fire personnel as requested.

The PSE Operations Section Chief will provide status updates via e-mail as needed to the following:

- System Operations Manager and Supervisor
- Load Office Manager and Supervisor
- Director, Electric Operations
- Manager, Substation Operations
- Manager, Gas Operations
- Manager, Gas System Integrity
- ECC Operations Section Chief
- ECC Director
- ECC Manager
- Corporate Communications Lead
- ECC Public Information Officer (PIO)

Updates should be provided as needed or at least every 4 hours.

5.3. RECOVERY

If PSE infrastructure has been damaged as a result of a wildfire, restoration personnel may not perform assessment and restoration work until fire command or the agency in authority has deemed the area safe for entry. Once entry is possible, and the safety of PSE personnel has been cleared, standard assessment, repair and restoration activity may commence consistent with our ESRP.

5.4. ROLES AND RESPONSIBILITIES

Roles and Responsibilities

System Operations	<ul style="list-style-type: none">• Wildfire risk monitoring• Operational readiness conference call• Situational briefing call• Electronic status updates (if ECC is not open)
Director, Electric Operations	<ul style="list-style-type: none">• Protection measure direction• Activating PSE Ops Section presence near fire command
Load Office	<ul style="list-style-type: none">• Transmission strategy, as applicable
ECC Director	<ul style="list-style-type: none">• Activation of the ECC, if during the situation briefing activation is requested
Corporate Communications & PIO	<ul style="list-style-type: none">• Customer messaging as appropriate• Situation report key messaging points, if ECC is activated
Business Services	<ul style="list-style-type: none">• Communication with major customers as appropriate
Government Relations	<ul style="list-style-type: none">• Communication with state officials as appropriate
Municipal Relations	<ul style="list-style-type: none">• Communication with local jurisdiction officials as appropriate

5.5. RESOURCES AND CONTACTS

- National Weather Service
- Northwest Interagency Coordination Center: <https://gacc.nifc.gov/nwcc/>
- Washington State Department of Natural Resources Burn Risk Map: <https://burnportal.dnr.wa.gov/>
- Washington State Incident Information Map: <https://inciweb.nwccg.gov/?state=49>
- PSE Wildfire Dashboard

5.5.1. WA DNR DISPATCH CENTERS

- Pacific Cascade Region, Castle Rock, WA 360-575-5089
- South Puget Sound Region, Enumclaw, WA 360-802-7031
- Northwest Region, Sedro Woolley, WA 360-854-2878
- Olympic Region, Forks, WA 360-374-2800
- Central Washington Interagency Dispatch Center, 509-884-3473
- Northeast Washington Interagency Dispatch Center, 509-685-6900
- DNR Coordination Center, Olympia, WA 360-902-1300 ask for the Center Manager

DNR webpage: <https://www.dnr.wa.gov>

6. COMMUNICATION AND OUTREACH

In the event of a wildfire-related electric or natural gas disruption, PSE will work to provide customers and the community, as well state, county and local agencies and other key stakeholders, with accurate and timely information. Communication will take place through channels and platforms commonly used in storms and other emergencies so as to leverage best practices and existing customer knowledge and preferences for how to access information from the utility. The objective will be to provide, if known, the cause of the service disruption, the nature of the disruption, such as whether the disruption is due to system damage or is precautionary, and an estimated time of service restoration. The goal will be to enable customers to take necessary preparedness actions and to minimize the inconvenience and hazards of a loss of energy service.

Key communication strategies to customers during wildfire-related disruptions will use a variety of traditional and digital media, depending upon the nature of the disruption, to provide updates and information through the following:

- Local news media, including broadcast, digital and print;
- Social media, using PSE’s existing social media platforms as well as those of news outlets and community partners;
- Digital advertising channels;
- Direct customer communications, which may involve the use of multiple PSE service channels, including:
 - Telephonic service available through PSE’s customer service representatives and interactive voice response (IVR) platform
 - Updates and information on [pse.com](https://www.pse.com) and the MyPSE mobile app
 - Deployment of community engagement team members

PSE will leverage its relationships with stakeholders and community partners, including state, county and local government agencies and officials, as well as non-profit, service and community-based organizations, in order to ensure they have current and correct information and also enable amplification and distribution of timely information across as wide an audience as possible. In disseminating any news or information, it will be a priority for PSE to notify all possible customers within an impacted area. Partnership and coordination with community leaders and trusted voices will extend the reach of vital information to the greatest number of residents and customers.

Prior to any specific wildfire threat, PSE is focused on communication with customers about preparedness. This communication has two goals: raising customer awareness about PSE wildfire preparedness, and, second, educating customers about how they can help prevent wildfires through information from the DNR. Communication activities will include general awareness as well as targeted communication, such as:

- [pse.com](https://www.pse.com) landing page featuring our wildfire preparedness plan and DNR resources
- Social media (organic and paid), email, earned media and printed bill inserts (for advance, seasonally-relevant information only)
- Outreach to community organizations, agencies and jurisdictions (including partners that serve vulnerable and hard-to-reach populations)

7. CONCLUSION

Energy is an essential service. PSE is proud to have served customers and communities across Washington state for nearly 150 years, and we are committed to the continued delivery of energy that is clean, safe, reliable, affordable and equitable for years to come. This plan reflects those priorities in its comprehensive approach to wildfire mitigation and response.

We also recognize wildfires are an emerging risk. It is PSE’s expectation that this plan serves as a solid foundation for future wildfire preparedness efforts. Many of the actions we take today have no noticeable impact on customers. We will continue to use those strategies given their high level of effectiveness with minimal impact on energy delivery to our customers. However, as we consider future actions that have a direct and significant impact on service to customers, we need to have a much deeper level of engagement from a broad range of stakeholders. As a community, we need to collectively evaluate the risks and determine the best course of action. We look forward to ongoing discussions with the Utilities and Transportation Commission as well as with our many public sector and community partners about this important topic.

