Wildfire Mitigation Overview

The line that connects us all

FORTIS ALBERTA

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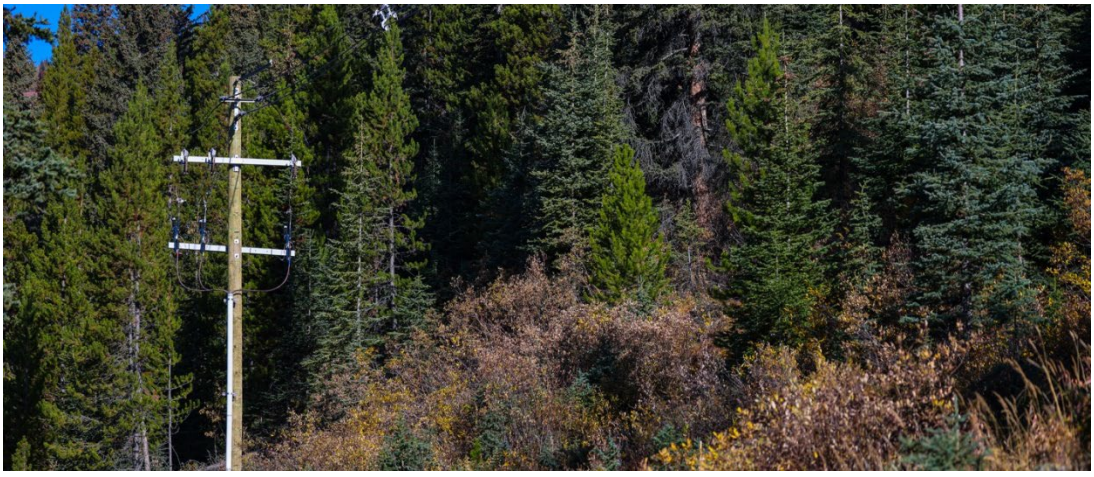
WILDFIRE RISK MITIGATION OVERVIEW

Wildfires are a familiar threat in Alberta due to the province's vast forests, prairie grasslands, high winds and dry climate. When a windstorm brings a wire to the ground or a tree falls on a line, there is a risk of ignition. That's why at FortisAlberta, we take wildfire prevention seriously and have a team that works on wildfire mitigation year-round.

FortisAlberta uses a comprehensive strategy to address wildfire risks that combines industry leading practices as well as advanced technological solutions to assist our team. We patrol power lines, manage vegetation, use fire-resistant materials and deploy advanced technologies like Early Fault Detection and Enhanced Power Safety Settings.

Our Wildfire Risk Mitigation Plan blends established practices with modern innovations to protect the communities we serve.



KEY WILDFIRE RISK MITIGATION CATEGORIES

The FortisAlberta Wildfire Risk Mitigation Plan can be organized into eight key categories: risk assessment, situational awareness, operational practices, wildfire response and recovery, asset inspections and management, vegetation management, grid design and hardening and communications planning.

WILDFIRE MITIGATION EFFORTS

FortisAlberta champions sustainable change, employing numerous wildfire risk mitigation processes, technologies and practices to protect Albertans, communities, the environment and critical infrastructure.

RISK ASSESSMENT

Risk assessment involves a systematic approach to understanding wildfire risks and prioritizing mitigation measures. We use mapping tools overlayed with available wildfire and weather data to identify high-risk and wildfire-prone zones throughout FortisAlberta service areas. By reviewing environmental conditions, historical data and real-time models our wildfire team can assess and identify where mitigation should be most aggressively applied.

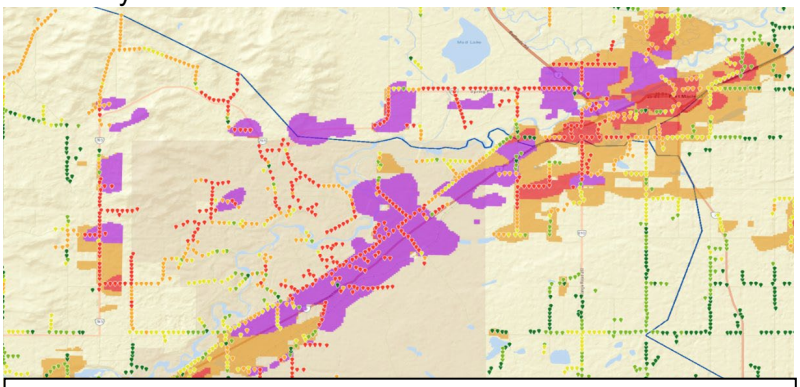


Image: Example of a map of high-risk fire areas where the impacts are more likely to be realized from a powerline wildfire.

SITUATIONAL AWARENESS

Situational awareness is crucial for understanding current and future conditions across the province. We use various geospatial tools, weather stations, fire mapping tools and wildfire hazard indexes to get a full picture of our power system and track environmental factors. Field employees and contractors receive regular Wildfire Hazard Bulletins, detailing current and expected province-wide hazards. These bulletins help them make informed decisions and add extra precautions during high-risk periods. Additionally, our Wildfire Hazard Dashboard brings together information from different external sources, simplifying the wildfire hazard identification process to help make informed decisions about taking extra precautions in the field.

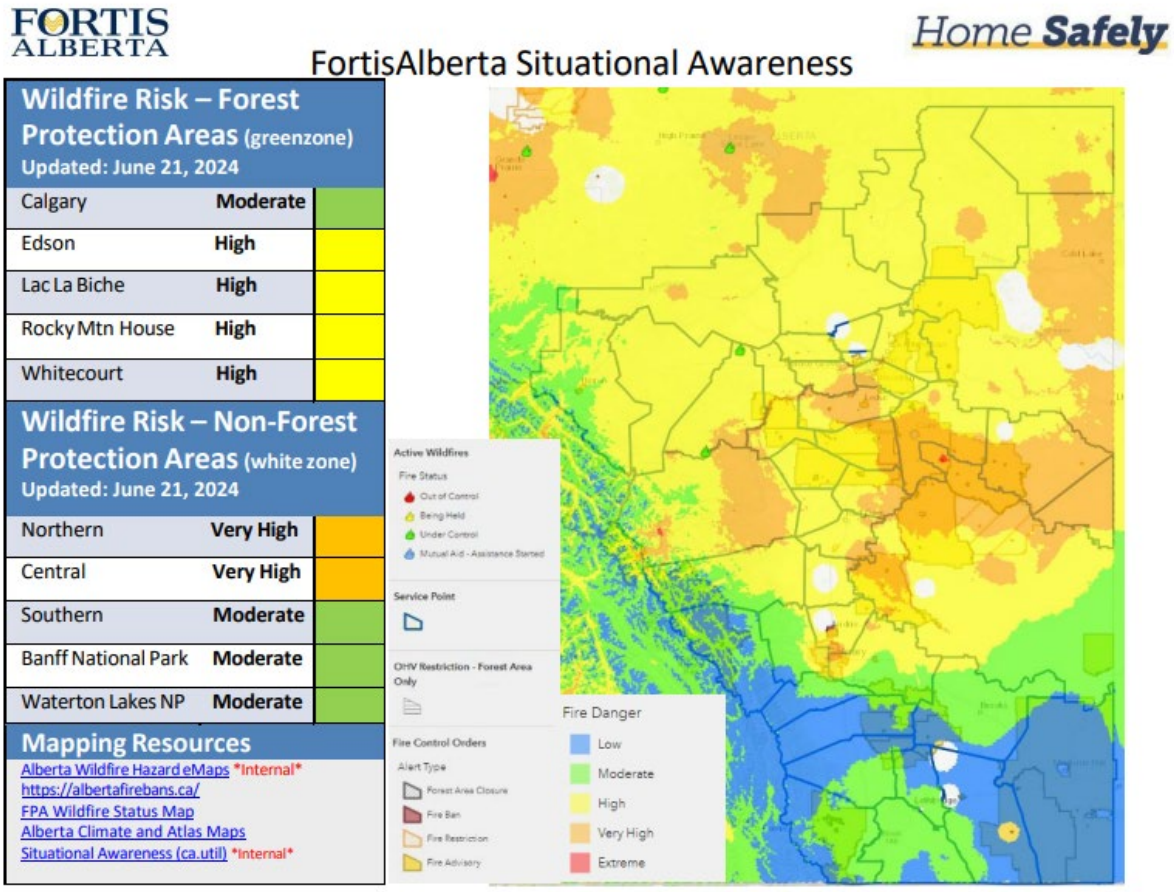
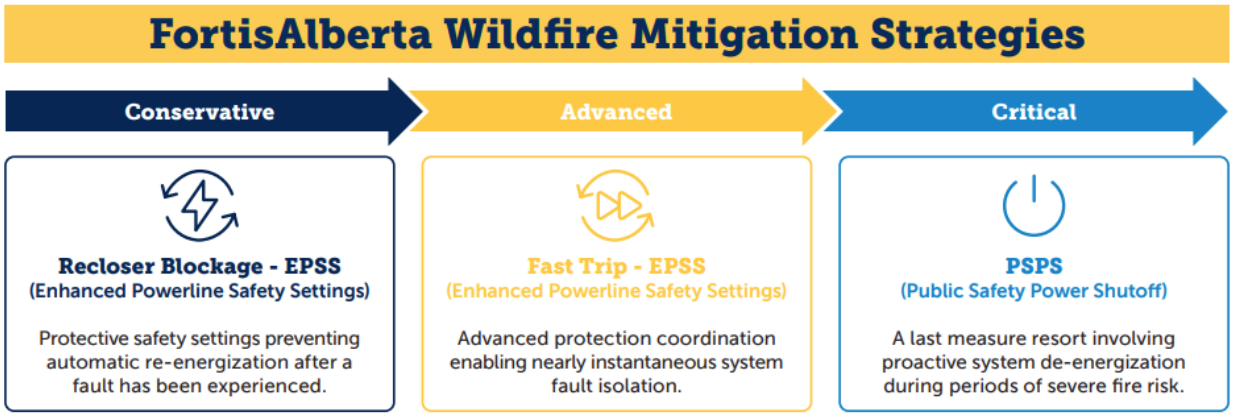


Image: Example of the dashboard shared with employees and contactors during wildfire season.

OPERATIONAL PRACTICES

Our frontline employees play a crucial role in preventing wildfires and putting our wildfire mitigation plans into action. They are out in the field, conducting patrols, inspections, repairs and responding to issues. We provide regular training to ensure they are equipped to handle wildfire risks, report incidents and respond in emergencies. They are trained to identify and address hazards on the job and use proper safety measures. Each of our field vehicles are stocked with firefighting tools like water packs, fire brooms and shovels.

When protective devices shut off in high wildfire-risk conditions, our team conducts thorough patrols before restoring power, reducing the chance of accidental faults that could start a fire. If a fire does occur, our personnel work closely with first responders to protect our infrastructure and limit the spread.



GRID OPERATIONS

The FortisAlberta Control Centre (FCC) closely monitors real-time and forecasted conditions using situational awareness tools and dashboards to guide decision-making on mitigation measures. During hot, dry and windy conditions that are conducive to wildfires, we proactively block reclosers, stopping power, in high-risk areas to reduce the risk of ignition in case of a fault. Supervisory Control

and Data Acquisition (SCADA) control devices allow operators to remotely communicate with devices and enable the ability to swiftly respond to potential risks. Operators can control numerous protective devices, including an application allows simultaneous recloser blocking based on real-time conditions. For devices not compatible with SCADA control, Power Line Technicians (PLTs) are dispatched for manual blocking. In the event of a Public Safety Power Shutoff (PSPS) declared by AltaLink, our transmission supplier, or when FortisAlberta makes the decision to initiate a PSPS the FCC will play a crucial role in coordinating staged restoration with PLTs once the event ends.

SAFE AND TIMELY RESTORATION

FortisAlberta collaborates with the transmission service provider and works together with the FortisAlberta Control Centre and field technicians to ensure safe and timely restoration of power to affected customers.

ENHANCED POWER SAFETY SETTINGS

Enhanced Powerline Safety Settings (EPSS) involves implementing advanced safety measures and technologies to improve the safety of powerlines. The safety settings that include a remote automated control system are designed to reduce wildfire risks and shut off power locally when a hazard, such as a tree branch, contacts a powerline. This minimizes the energy released during a fault, thereby reducing the likelihood of ignition.

SAFETY SETTINGS REDUCE WILDIFRE RISK

The locations that will be equipped with Enhanced Power Safety Settings (EPSS) in 2025 include Yellowhead County, Woodlands County, portions of Edson and Whitecourt, the Crowsnest Pass and the Bow Valley Corridor.

These locations were selected based on criteria such as existing lines fed by reclosers, limited customer impact, proximity to high-risk fire areas (HRFA) and known or potential right-of-way (ROW) or vegetation concerns.

Safety Measures and Technologies

Description of the advanced safety measures and technologies used for EPSS: EPSS incorporates advanced safety measures such as fast trip protection settings, which increase the sensitivity of protection devices to shut off power faster when a fault is detected. Additionally, the program includes regular maintenance schedules, vegetation management around power lines, and advanced monitoring systems to detect potential hazards.

Automatic power shutoff when a hazard contacts a powerline: EPSS is designed to automatically shut off power when a hazard, like a tree branch, contacts a powerline. This is achieved by adjusting the sensitivity of reclosers and disabling the automatic reclose feature, allowing power to be shut off faster than normal, thereby reducing the likelihood of ignition.

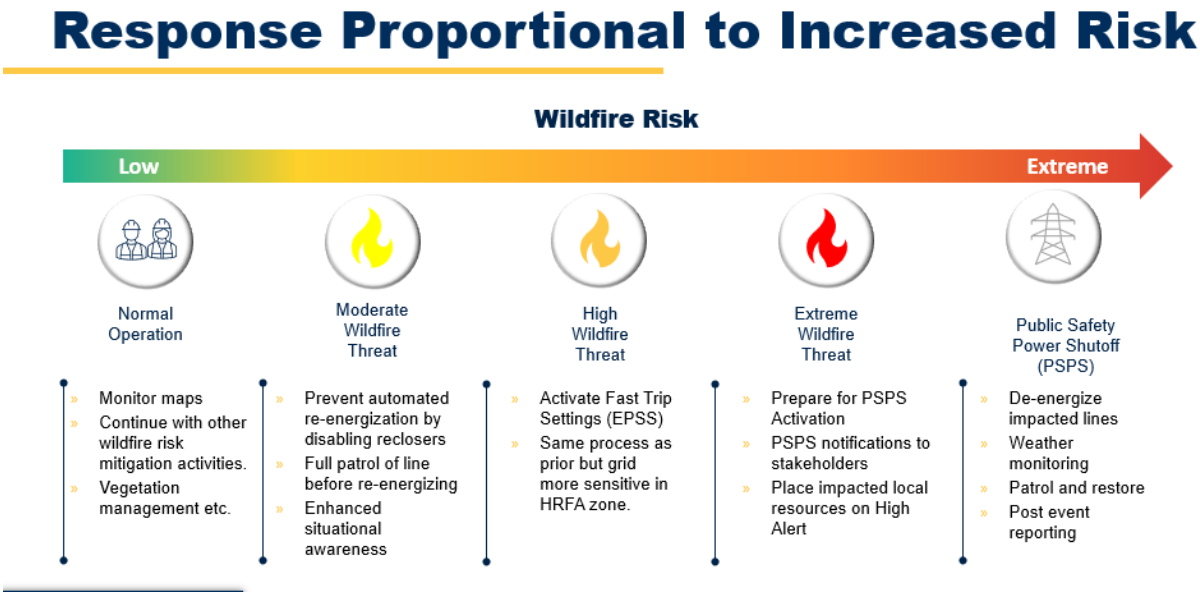
PUBLIC SAFETY POWER SHUTOFF

Public Safety Power Shutoff (PSPS) involves proactively shutting off power during extreme and dangerous weather conditions to prevent wildfires. PSPS is used as a **last resort** when there is a high risk of wildfires due to factors like high winds and dry vegetation. FortisAlberta will phase-in the implementation of PSPS in 2025 which could be enacted within high priority areas. To assist with real-time weather data and forecasting, FortisAlberta has its own weather stations which have been strategically installed to monitor weather conditions and used to cross-reference with other publicly available data. FortisAlberta's wildfire team members have qualifications in meteorology and interpreting wildfire data, which will enable FortisAlberta to provide as much notice as possible to potentially impacted communities in advance of shutting off powerlines when conditions are at their worst. The areas that will have these PSPS protections beginning in 2025 will be the same areas that have Enhanced Powerline Safety Settings mentioned on the previous page.

PUBLIC SAFETY POWER SHUTOFF

In high-risk situations and in areas where the program has been implemented, FortisAlberta will proactively shut off power to reduce wildfire risk and protect communities.

The operational procedure is a common industry practice used as a precautionary measure to protect residents and communities during extreme weather conditions that could lead to wildfires. Due to the situational nature of PSPS, it is difficult to predict which customers will be affected, as it depends on forecasted weather conditions and potential threats. PSPS is expected to be implemented infrequently and only under the most extreme conditions.



Importance of Public Safety Power Shutoff

A Public Safety Power Shutoff (PSPS) is a critical measure used by several utilities to prevent wildfires during high-risk weather conditions. Integrating PSPS into mitigation efforts is essential for several reasons:

Firstly, PSPS helps to reduce the risk of catastrophic wildfires by proactively turning off power in areas where electrical infrastructure could spark fires. This is particularly important in regions with highest-risk fire areas (HRFAs) where the risk of power line fires igniting and spreading rapidly is important.

Secondly, integrating PSPS into mitigation strategies enhances overall energy resilience. By planning and preparing for PSPS events, FortisAlberta can ensure communities are prepared.

This involves improving modeling and asset conditions, which can significantly reduce the frequency and scope of PSPS events.

Lastly, effective communication and coordination are crucial for the success of PSPS programs. Utilities must work closely with local governments, emergency response organizations, and the community to ensure that everyone is aware of the potential for PSPS events and prepared to respond appropriately.

WILDFIRE RESPONSE AND RECOVERY

Comprehensive response and recovery plans are required for mitigating impacts during a wildfire event and to support efficient recovery. FortisAlberta collaborates with emergency response teams (EMT) to streamline actions in wildfire situations. With more than 350 field employees across 240 communities, FortisAlberta can mobilize incident command systems quickly and respond with needed equipment.

ASSET INSPECTIONS AND MANAGEMENT

Prudent asset management and inspection practices are vital for ensuring the safety and reliability of our distribution system. Since 2020, we have implemented an annual high-risk fire area (HRFA) patrol and repair program, focusing on areas and points with higher fire risk across our service territory. This initiative has helped us identify and remove risky components, making our system safer and more resilient.

In addition to this program, we prioritize other activities like end-of-life rebuilds, pole replacements and switch upgrades in high-risk fire areas. By focusing on these areas, we can minimize the potential impact of potential events while still delivering the safe and reliable service our customers rely on every day.

VEGETATION MANAGEMENT

To ensure public safety and reliable electrical service, FortisAlberta must prevent trees and branches from touching overhead conductors, wires, or equipment on poles. We conduct vegetation inventories across our system every three to four years to plan long-term management. Our goal is to establish a consistent cycle for controlling problematic vegetation, promoting compatible growth along rights-of-way, and identifying hazardous trees. As we evolve our integrated vegetation management practices, we aim to increase the use of herbicides, based on stakeholder input, to reduce the time and resources needed for mechanical management. This shift allows for more efficient management of new rights-of-way, minimizing wooded vegetation and fire fuel while respecting the rights of landowners and stakeholders. We are also improving our hazard tree program by investigating tree strikes and enhancing our ability to predict and remove failing trees promptly.

GRID DESIGN AND HARDENING

Advancements in engineering standards and technology are also playing a crucial role in our mitigation efforts. As the first utility in Canada to implement early fault detection technology, we now monitor more than 2,100 kilometres of powerlines allowing us to proactively find system vulnerabilities (such as broken strands) before they break and before they become problems (or cause outages). Upgrading reclosers and implementing expulsion-limiting fuses (ELF) further reduces fire risks, while spaced aerial cables (covered conductor) provide insulation against interference from trees or wildlife. These measures significantly decrease the chances of ignition incidents within our system.

Image: lower arms of distribution pole show the early fault detection technology used.

Early Fault Detection

FortisAlberta was the first utility in Canada to implement early fault detection technology. Early fault detection can identify defects like the broken conductor strands shown here within a 10-metre accuracy, preventing faults and reducing wildfire risks.

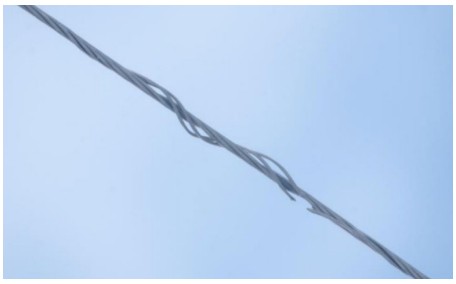


Image: Example of a broken conductor strands that can be identified through early FortisAlberta's early fault detection technology.

While we are dedicated to reducing the risk of ignition on our distribution system, we are also taking extra steps to protect against wildfires. Recently, we launched a fire wrap program, installing protective barriers on our wood poles to prevent them from burning if a fire approaches.

Images: Pole fire wrap (left) covered conductor (right)

COMMUNICATIONS PLANNING

Effective public engagement and communication is essential when communicating with impacted customers during outages and potential wildfire events. The FortisAlberta outage alert system and customer care centre operates 24/7 365 days a year providing real-time reporting and active live updates on both planned and unplanned outages. To encourage community members to be prepared for a potential outage, FortisAlberta uses radio, television and other communications tools to inform the public about how to prepare for potential natural disasters and power outages.

FortisAlberta is continuously improving and identifying opportunities to improve wildfire mitigation practices and procedures. Through its Climate Adaptation Committee various perspectives and experiences of employees with different backgrounds work to collaborate on wildfire prevention initiatives and review our practices.

FortisAlberta Climate Adaptation Committee members also participate in external committees with government and other utilities focused on wildfire prevention. The team includes experienced professionals who provide specialized knowledge in weather patterns, meteorology and in wildfire mitigation practices at the provincial level. Our comprehensive approach combines efforts to prevent ignition events with investments in resilience to minimize the impact of wildfires on our customers. Combined with being recognized in the industry for our wildfire mitigation program and 2023 wildfire response, we are committed to providing effective and cost-efficient wildfire mitigation for our customers' benefit.

For more information on FortisAlberta's wildfire mitigation, please visit fortisalberta.com/wildfire-mitigation and fortisalberta.com/publicsafety

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WILDFIRE MITIGATION

Our Approach to Wildfire Mitigation

Wildfires are a familiar threat in Alberta due to the province's vast forests, prairie grasslands, high winds and dry climate. When a windstorm brings a wire to the ground or a tree falls on a line, there is a risk of ignition.

That's why at FortisAlberta, we take wildfire prevention seriously.

FortisAlberta uses a comprehensive strategy to address wildfire risks. We patrol power lines, manage vegetation, use fire-resistant materials and deploy advanced technologies like Early Fault Detection. Our Wildfire Risk Management Plan blends traditional practices with modern innovations to protect the communities we serve.

Here's how we're tackling it:

- **Risk Assessment:** High-risk areas are mapped and include real-time data to prioritize wildfire mitigation efforts.
- **Situational Awareness:** Public and FortisAlberta gathered weather data and fire mapping tools are used to stay updated on conditions and respond quickly to threats.
- **Operational Practices:** Equipment settings are adjusted based on wildfire risk criteria, staff members are trained and extra inspections are completed during high-risk periods to reduce ignitions. In extreme wildfire risk conditions, a Public Safety Power Shutoff may be initiated as a last resort during wildfire season.
- **Wildfire Response and Recovery:** Emergency response with first responders is coordinated and practiced initiating rapid response protocols when required to handle wildfire incidents and recovery efficiently.
- **Asset Inspections and Management:** Regular inspections, including the use of early fault detection, and proactive maintenance help prevent our infrastructure from igniting wildfires.
- **Vegetation Management:** Safe clearance zones around powerlines and infrastructure are maintained including working collaboratively with landowners to manage vegetation.
- **Grid Design and Hardening:** Infrastructure is strengthened with fire-resistant materials and advanced technologies help to withstand wildfire conditions.
- **Communications Planning:** Effective communications planning keep communities informed with timely updates and clear communication during wildfire incidents.

To learn more, visit **fortisalberta.com/wildfire-safety**.

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WILDFIRE MITIGATION

Wildfire Risk Mitigation Approach

FortisAlberta uses a comprehensive strategy to address wildfire risks. We patrol power lines, manage vegetation, use fire-resistant materials and deploy advanced technologies like early fault detection. Our Wildfire Risk Mitigation Plan blends established practices with modern innovations to protect the communities we serve.

Risk Assessment

Risk assessment involves a systematic approach to understanding wildfire risks and prioritizing mitigation measures. It generally includes:

- **Risk Identification:** Mapping high-risk areas, particularly where utility infrastructure intersects with wildfire-prone zones.
- **Risk Analysis:** Reviewing factors like environmental conditions, historical data and real time models to quantify wildfire risk, particularly for assets that could ignite fires.
- **Risk Evaluation:** Assessing the overall risk profile to set priorities, identifying where mitigation should be most aggressively applied. Regular updates to the risk profile ensure responsiveness to new data and conditions.

Situational Awareness

Situational awareness provides real-time insight into conditions that influence wildfire risk, enabling timely responses. Key practices include:

- **Monitoring and Forecasting:** Utilizing weather forecasts, weather stations, fire risk mapping tools and wildfire hazard indices to track environmental conditions.
- **Integrated Visualization Tools:** Sharing dashboards throughout the company that include geospatial mapping platforms overlaying utility assets with real-time wildfire data for rapid decision making.
- **Communication Systems:** Collecting local wildfire reports, real-time and forecasted public and FortisAlberta-owned weather data that is clearly shown on a consolidated platform to stay informed about active fires and emerging threats near assets.

Operational Practices

Operational awareness provides real-time insight into conditions that influence wildfire risk, enabling timely responses. Key practices include:

- **Customized Protection Settings:** Adjusting the settings to make our system more sensitive and efficient during high-wildfire conditions by temporarily disabling automatic reclosing.
- **Field Protocols and Training:** Educating field staff to identify wildfire hazards, using risk-reducing work practices and responding appropriately to ignition threats.
- **Fire Season Adjustments:** Conducting additional inspections and enable enhanced powerline safety settings to reduce ignition risks during wildfire season.
- **Public Safety Power Shutoffs:** Enabling the ability to initiate a power shutoff, as a last resort, if conditions exceed thresholds in designated high-risk areas to ensure public safety.

Wildfire Response and Recovery

A comprehensive response plan is essential for mitigating impacts during a wildfire and ensuring efficient recovery. Key elements include:

- **Emergency Coordination:** Aligning response protocols with first responders and emergency management agencies to streamline actions in wildfire situations.

- **Resource Mobilization:** Activating incident command systems and readying staff and equipment for rapid response when wildfires threaten assets.
- **Post-Incident Evaluation:** Conducting thorough assessments after incidents to improve future wildfire readiness and refine response strategies.

Asset Inspections and Management

Regular inspections and proactive maintenance are critical for minimizing infrastructure's role in wildfire ignition. Important practices include:

- **More Frequent Inspections:** Deploying ground and aerial inspections, especially in high-risk zones, to identify and address potential ignition sources.
- **Advanced Detection Technology:** Using high-impedance fault detection and early fault detection systems to detect vulnerabilities.
- **Targeted Maintenance:** Prioritizing maintenance activities, such as replacing worn or vulnerable components, to reinforce infrastructure resilience.

Vegetation Management

Vegetation management helps prevent vegetation from making contact with utility infrastructure, reducing the chance of ignitions. Strategies include:

- **Clearance Standards:** Establishing safe clearance zones around powerlines and conducting regular inspections to ensure compliance.
- **Enhanced Management in High-Risk Areas:** Increasing vegetation trimming frequency and expanding clear zones, particularly in fire-prone regions.
- **Stakeholder Collaboration:** Engaging with local landowners and regulatory bodies to support long-term vegetation control near utility lines.

Grid Design and Hardening

Grid hardening focuses on strengthening infrastructure to withstand wildfire conditions and prevent ignitions. Approaches include:

- **Use of Fire-Resistant Materials:** Covering wood poles with fire-retardant mesh or replacing wooden poles with fiberglass alternatives, especially in high-risk areas.
- **Covered Conductors and Undergrounding:** Installing covered conductors or undergrounding lines in the most vulnerable zones to reduce ignition risk.
- **Resilient Line Designs:** Designing lines to withstand high wind extreme conditions.
- **Additional Reclosers:** Installing reclosers to sectionalize lines for Enhanced Powerline Safety Settings and Public Safety Power Shutoff events.
- **Hydraulic Recloser Replacements:** Replacing hydraulic reclosers with SCADA-enabled ones to allow operators can monitor and control remotely for safety and power outage events.

Communications Planning

Effective communications planning ensures that all stakeholders receive timely, relevant information during wildfire incidents. Key components include:

- **Proactive Outreach:** Engaging communities and stakeholders ahead of wildfire season to set expectations and communicate preparedness efforts.
- **Enhanced Power Safety Settings (EPSS) and Public Safety Power Shutoff (PSPS) Protocols:** Outlining procedures for notifying impacted areas about potential outages during extreme wildfire conditions.
- **Real-Time Updates:** Providing clear, frequent updates during wildfire incidents, ensuring customers and responders are informed of developments and expected power restoration timelines.

FortisAlberta Wildfire Mitigation Strategies

Conservative → **Advanced** → **Critical**

Recloser Blockage – EPSS
(Enhanced Powerline Safety Settings)

Protective safety settings preventing automatic re-energization after a fault has been experienced.

Fast Trip – EPSS
(Enhanced Powerline Safety Settings)

Advanced protection coordination enabling nearly instantaneous system fault isolation.

PSPS
(Public Safety Power Shutoff)

A last measure resort involving proactive system de-energization during periods of severe fire risk.

Recloser Blockage – EPSS

- Baseline wildfire ignition protective measure with the lowest impact to system reliability.
- Does not disrupt system protection coordination and maintains sectionalized restoration patrol abilities.

Protection Device Criteria	Devices with blockage functionality protecting FortisAlberta Overhead Assets in High Risk Fire Areas 5 and 6.	
Monitoring Area	Grasslands	Forested
Wind Speed	N/A	N/A
Fire Risk Metrics:		
1)	FWI >30	FWI >30
2)	Grass Curing 75%	N/A
Other Considerations	• AB Wildfire Red Flag Warning	

Fast Trip – EPSS

- Rapidly detects and deenergizes powerline faults within 100 milliseconds.
- Disrupts system protection coordination, increasing outage durations and restoration patrol demands.
- Increased probability of negative reliability impact, drives the need for precise utilization supported by complex enablement criteria.
- System device coordination limitations can prevent the effective application of Fast Trip Protection due to incompatibility.

Protection Device Criteria	Devices identified through an engineering analysis across all fast trip capable devices within designated PSPS Areas.			
Monitoring Area	Grasslands	Foothills/ Mountains	Crowsnest Pass	Edson/ Whitecourt
Wind Speed	>40 km/h	>40 km/h	>40 km/h	>30 km/h
Fire Risk Metrics:				
1)	ISI >15	FWI >30	FWI >40	FWI >30
2)	Grass Curing 75%	Temp/RH Crossover	Temp/RH Crossover	Temp/RH Crossover
3)	FFMC >92	N/A	N/A	N/A
Other Considerations	• AB Wildfire Red Flag Watch/Warning • Fire Bans • Wind gusts • HDWI (Hot, Dry, Windy Index) • Upper air soundings • Seasonality/Burning Period			

PSPS

- Implemented when critical fire weather conditions are present.
- Highly effective in eliminating ignition risk.
- Considered a last resort due to its disruptive nature.
- Requires careful impact planning and proactive stakeholder communication.
- Continuous Monitoring
- Detailed Review at Criteria Thresholds
- PSPS Approval/Communication Protocols
- De-Energization
- PSPS Local Event Support (Emergency Operations Centre)
- Conditions Improvement Restoration Patrol
- PSPS Patrol Completion/Re-Energization

Protection Device Criteria	Feeders identified in the high-risk areas PSPS analysis.		
Monitoring Area	Edson/Whitecourt	Banff/ Canmore	Crowsnest Pass
Wind Speed	>40 km/h	>60 km/h	>60 km/h
Fire Risk Metrics:	FWI >40	FWI >60	FWI >60
Other Considerations	• AB Wildfire Red Flag Watch/Warning • Fire Bans and Forest Closures • Wind gusts • Structural Wind Loads • Temp/RH crossover • HDWI (Hot, Dry, Windy Index) • Upper air soundings • Seasonality/Burning Period		

• Fire Weather Index (FWI) • Initial Spread Index (ISI) • Fire Fuel Moisture Code (FFMC)

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