

The four seasons of vegetation risk

Climates vary from state to state, country to country, in differing degrees but all four seasons bring unique risks for T&D network operators trying to manage vegetation risk. The lightning strikes of summer storms coupled with the season's tinder dry conditions heightens risk of wildfire, winter brings snow, with the additional weight on branches increasing breakage and therefore risk; spring signals thaw and resultant floods as well as rapid vegetation growth that is hard to stay on top of; and fall brings a shower of fallen – often dry – leaves and fire risk with it.

Nature doesn't work according to predictable or convenient timetables and a utility has to ensure it has the tools and systems in place to cover large distances of ground in fine detail to effectively manage and stay ahead of the risks.

With 2020 on track to be one of the hottest years on record, the National Interagency Fire Center has warned of increased fire risk across America's West Coast. While Arizona tackles the fifth largest fire in the state's history, Washington and Oregon are preparing for the highest increase in wildfires versus the annual average of anywhere in the US.

Every season carries risk that threatens power outages, but wildfire season brings additional risk to life and property, making it the most hazardous. As the US utility industry gears up to tackle the challenges presented by the summer months, how can utilities respond to these risks and ensure they are providing for safe operations throughout wildfire season and beyond?

Looking down the (power) line

Nature waits for no one and follows no clearance plan. For a utility to stay ahead of nature, it must be smart about pre-empting risk and cutting it down ahead of time. The electric utility business is always looking ahead from 10 year plans, five year plans, annual plans, and seasonal plans, preparing disaster response strategies at least six months ahead of time and reducing threats by cutting back overgrown vegetation that risks coming into contact with power assets.

This month saw the National Weather Service pepper the West Coast with red flag fire warnings due to strong winds and low relative humidity increasing the risk of rapid wildfire spread. In light of this outlook, it's likely some companies will look to reduce their risk exposure by implementing a Public Safety Power Shutoff (PSPS) in effect cutting electricity supply completely.

It's a bold and often controversial approach but in October last year PG&E, one of the US's largest gas and electric utilities did exactly that, electing to cut the power to 800,000 homes in California amid warnings that power outages would likely remain a critical part of fire prevention programs for decades to come.

Although this approach reduces risk in the short term it is not without its challenges. In addition to causing huge disruptions for customers, turning the power back on in a region that has suffered very high winds carries significant risk. There is a strong

likelihood that a tree will have come into contact with a line, or that the lines are broken or otherwise damaged. Before power is reinstated, utilities need to be absolutely certain that all lines are clear from danger – but in a disaster hit zone that spans tens of thousands of miles, how can this be done?

A holistic approach to asset inspection

Having access to a holistic view of the vegetation conditions surrounding T&D assets throughout the changing seasons is paramount for any utility company. Historically, vegetation management was largely done manually, a painstaking and time-consuming process and without the reliable calculation of potential risks.

One way to help gain sufficient oversight on vast territories with assets and vegetation competing for space has been to elect a ‘clear sky’ approach, effectively a clearance strategy that leaves no tree behind and limits the potential damage before it is caused. Although this removes significant risk around system damage it is not without environmental impact and customer concerns. Some customers simply will not tolerate it.

Power companies don’t want to trim any more trees than absolutely necessary which gives rise to a need for a software solution that not only delivers aerial inspection capabilities, but one that incorporates species identification as part of its offering. This enables a utility to tell – with accuracy – what type of vegetation is growing in a particular region, which plants are the fastest growing and, critically, which ones are more suspect in conditions that give rise to wildfires. A prohibitively lengthy and arduous process if attempted manually.

Utility inspection below the canopy

The utility industry has been transformed in recent years by AI and machine learning. This technology-led approach now sits alongside manual work as a key aspect of a utility’s monitoring and inspection schedule.

Foot patrol inspections remain a must, especially in the summer months where fast-growing vegetation means canopy cover can obscure aerial images. In such instances flyovers alone cannot be relied upon to capture T&D lines and walking under the canopy is critical to accurately inspect the conditions of the infrastructure above. Recent strides in aerial inspection software means that we are now seeing software solutions that are able to take large volumes of siloed data from aerial and on-foot inspections, and assimilate it into a single, holistic view of the electricity circuit or system. This data analysis technique enables utilities to create a fully prioritized vegetation management plan by delivering a clear view of what is happening both above – and below – the canopy.

The future of vegetation management

The transformative T&D solutions we see in the market today use AI and machine learning to provide deep data analysis, prioritization and forecasting tools for vegetation management issues. The ability of software systems to analyze LiDAR data and hyperspectral imaging in means that at the click of a button utilities can view a territory covering thousands of miles in granular detail, including how many

strike trees there are in a given location or how many trees sit within a 12 foot distance of an electric line.

Whether in the heights of summer or the depths of winter, a digital solution that adapts to each utility's needs and works with its existing digitalization efforts and processes is key to keeping on top of existing and future vegetation growth challenges, whatever the weather.