# Considerations for Implementing Prescribed Fire Near Utility Infrastructure

Utility infrastructure is widespread across wildland and urban areas, including in places where fuels treatments and prescribed fire are planned. The presence of utility infrastructure should not prevent these critical projects from happening, but it does call for additional planning and safety precautions.This fact sheet describes the utility infrastructure that is commonly found on private property, outlines the potential hazards associated with burning, shares best management practices for burning around utility infrastructure, and provides insights on what to do if something goes wrong. **This fact sheet is intended for landowners and/or prescribed fire practitioners who plan to burn around utility infrastructure.**

Prescribed fire is a critical tool for reducing future fire risk, both generally and specifically in relation to utility infrastructure. Reducing fuel loads around utility lines can decrease the spread of wildfires, provide safer conditions for fire personnel, and create landscapes that are more fire resilient. However, it is important for fire practitioners to understand the hazards associated with burning around utility infrastructure. Damaging poles, power lines, or underground pipelines, or weakening trees that could strike equipment, may lead to dangerous electrical arcing, widespread power outages, and life-threatening emergencies. **By learning to identify these systems, coordinating with local utility companies, and applying the appropriate safety precautions, you can protect yourself and critical infrastructure while successfully implementing prescribed fires**

**Figure 1**: Prescribed burning under power lines, Humboldt County Prescribed Burn Association. Photo: Lenya Quinn-Davidson.

## Utility Infrastructure Commonly Found on Private Property

The most common types of utility infrastructure found on private property are transmission and distribution systems and undergound infrastructure. These utility systems could include the following:

- **Utility Right of Way (ROW)** - A Utility ROW is a designated area of land on private property that utility companies are allowed to enter for installation and maintenance of utility equipment.[1] These ROWs are also referred to as “Public Utilitiy Easements” (PUEs), as they typically involve easement agreements between landowners and their utility companies.[2]
- **Transmission Systems** – Transmission systems typically carry electricity over long distances and contain both utility lines and large metal towers to hold them. The electricity from these systems often comes directly from a power plant and is then carried to a distribution system that brings electricity to houses.The range of voltage for transmission lines is typically between 36kV and 500kV.[3] Voltages for utility infrastructure are typically measured in **kilovolts (kV),** a unit of potential energy equal to a thousand volts.

- **Distribution Systems** – Distribution systems receive electricity from transmission systems and distribute it to households. These systems typically contain large wooden utility poles that have utility lines connected to them. In a distribution system, there are many components that can be found on a single utility pole, such as transformers attached at the top of each pole, fuses, and down guys (Figure 2). Distribution systems commonly carry both telephone and cable wires as the lowest wires attached to the poles. Voltages are much lower in distribution lines, with a range between 2.4kV and 35kV at the top of the pole, which reduces to 120 volts to 480 volts before delivery to a residential property.[3]
- **Underground Infrastructure** – Underground gas infrastructure can be found on private property if a utility has an ROW. Utility ROWs may contain hazardous liquid pipelines to transport gasoline and diesel fuel. For safety, call 811 before you dig. To determine if an ROW on your property has underground pipes, look for utility poles that delineate where underground pipes are and what they are carrying. These poles will list an operator, the transported product, and a telephone number for reporting pipeline emergencies. Additionally, poles or markers for underground infrastructure will be color-coded depending on the type of cable or pipeline that is underground.[4] Color codes include:
    - **Blue** – Used to mark potable water lines.
    - **Green** – Used to indicate sewers.
    - **Red** – Used to indicate electrical cables.
    - **Yellow** – Used to indicate gas, oil, and petroleum products.
    - **Orange** – Used to indicate telephone, cable, and communication lines.

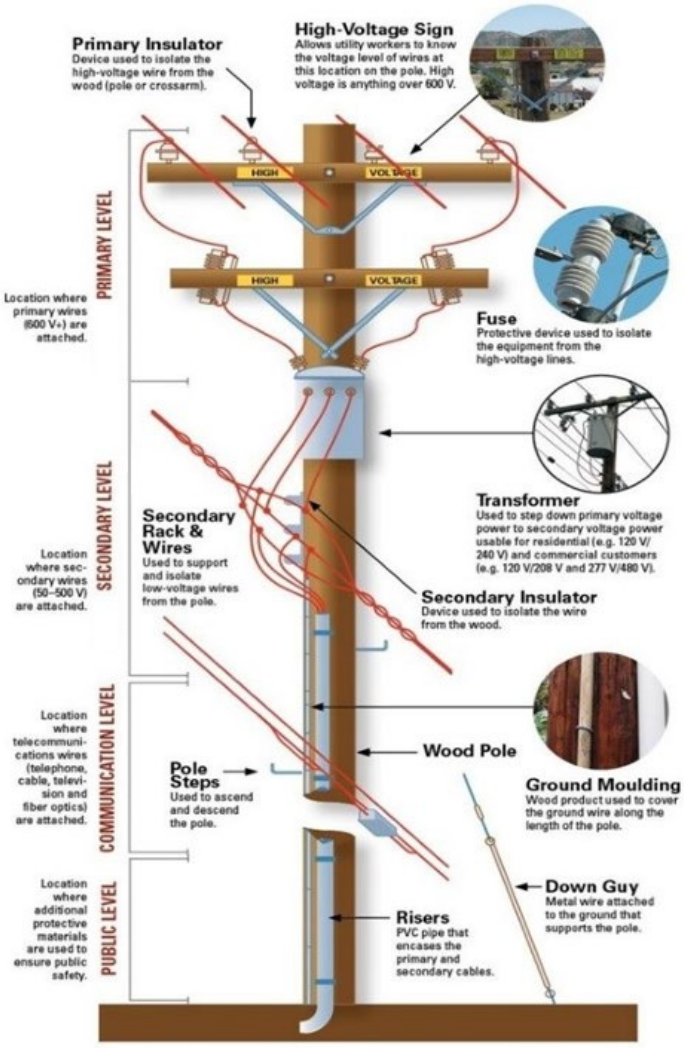


**Figure 2:** Detailed overview of a distribution system. Different levels of electricity (Primary, Secondary, Communication lines) working from the top to the bottom of a distribution power pole. Diagram: CALFIRE


**Figure 3:** Various community infrastructure markings for underground infrastructure. Photo: FEMA

# Hazards of Prescribed Fire Around Utility Infrastructure

There are several hazards/dangers that could arise when burning under or around utility infrastructure, including:

## Burning of Utility Poles

The burning of utility poles is one of the most common dangers that can occur on a prescribed burn, potentially leading to multiple other hazards. For example, once a wooden pole catches on fire, it can smolder or burn from the inside out after the surface fire appears to be extinguished.[5] Other examples of hazards include:

- Scorching of power poles damages the protective layer that prevents moisture from entering the core of the pole, shortening the lifespan.[6]
- The ash created by burnt power poles may contain hazardous substances from wood preservatives that are harmful to people, wildlife, and the environment.[7]
- A burned pole is more likely to fall over, resulting in downed lines, which have the capability to stay energized or arc. Be aware that energized lines can transfer energy to other surfaces, such as wire fences or vehicles.[8]

**Figure 4**: Various types of ways utility poles can be damaged by fire. Photo: Woodpoles.org

- Downed poles can impact the community around a burn. A single transmission outage can impact 30,000 customers, including critical facilities like hospitals and nursing homes.[9]

## Line Arching Due to Smoke

Line arcing occurs when carbon particles, such as in smoke, conduct electricity, causing an electrical discharge (Figure 5).[5] In thick smoke, electrical arcs can extend from the power line to the ground, with the potential to connect with and injure prescribed fire personnel.

- In some cases, heat from a fire can cause power lines to stretch and droop. As lines get closer to the ground, an arc flash to a person or vehicle is more likely to occur.[10]

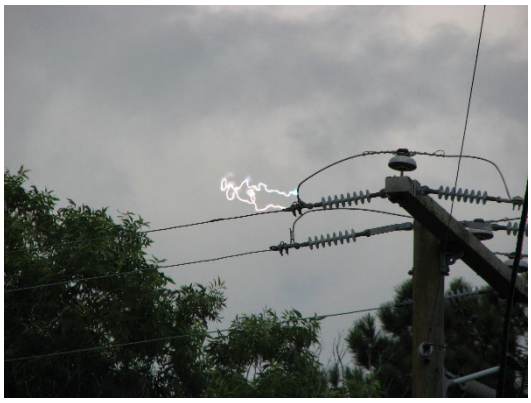

**Figure 5:** Example of powerline arcing. Photo: College of Charleston

## Strike Trees

A tree weakened by prescribed fire could fall toward utility lines or strike another object that could then strike the lines. Identification of these potential hazards in proximity to utility assets is an important planning element. If you are unsure about identifying strike trees, reach out to a local Registered Professional Forester (RPF) or arborist for assistance.

# Best Practices for Burning Around Utility Infrastructure

There are several ways to prepare and conduct your prescribed burn to minimize potential risks. Additionally, **some utility companies may be able to send a crew to help prepare for the burn, and/or stage an engine on site the day of your burn**. In order to find out if your utility company is able to do this for you, review CALFIRE's Utilities Contact List to find the contact for your energy provider.

## Before the Burn

- Note any relevant utility infrastructure in your burn plan and coordinate with your utility company in implementation plans. If possible, request assistance with unit preparation and/or day-of-burn assistance.[11]
- Call 811 prior to building the fire line if there is underground infrastructure on your property.[12]
- **If utility poles are within your prescribed burn unit, remove all grass or flashy fuels, as well as any dead material and ladder fuels, around poles and any supporting guy wires or anchors.** The total distance of fuel removal around the pole will depend on factors such as slope and presence of other non-flammable surfaces.
- Work with an RPF or arborist to note and flag potential strike trees that could pose a primary or secondary hazard to the utility lines. Strike trees would include weakened or vulnerable trees with potential to ignite and/or fall on power lines.
- Notify your neighbors and all applicable permitting agencies prior to burning.

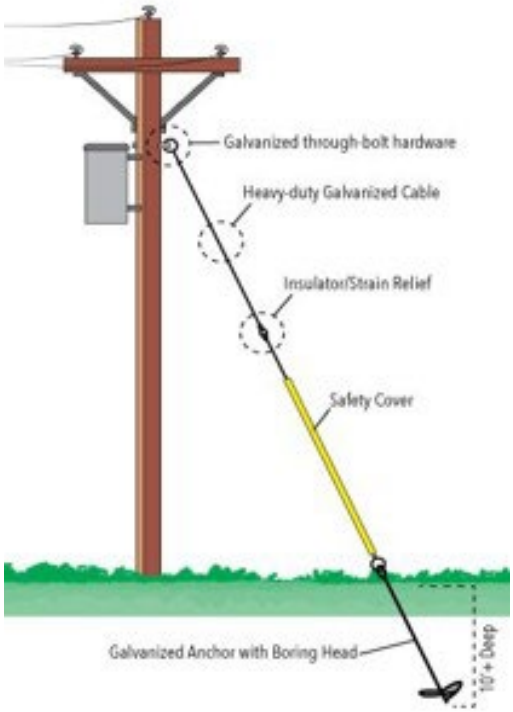


**Figure 6**: Image of various components commonly found on utility infrastructure. Diagram: PG&E

- Plan to burn on a day when smoke will be carried away from your power lines. Plan to pile material away from the lines to avoid flame and/or smoke impacts.

## During the Burn

- Saturate the bare mineral soil as well as the base of any power poles in your burn unit prior to ignitions.[6] When possible, wetting areas around overhead assets may also be beneficial.
- Burn when wind speed is low and in a steady direction that can carry smoke away from power lines.[11]
- If smoke becomes thick under power lines, or if power lines begin to droop, relocate personnel to avoid potential arcing hazards.

## After the Burn

- **Always monitor the area for smoldering once a prescribed burn is complete** and ensure the area is safe prior to leaving the unit.[13]

## What to Do If Utility-Related Accidents Happen

If utility-related concerns arise on your prescribed burn, there are multiple steps utility companies recommend you follow immediately:

- Keep a distance of at least 60 feet away from downed distribution lines and at least 100 feet from downed transmission lines.[14]
- Do **NOT** spray water on flaming/burning utility poles, as this can cause a fatal short circuit.[13] **Immediately call your local fire department and utility company** to notify them of the situation.[11]
- Immediately call the operator's gas control center if you suspect underground infrastructure has been compromised.[12]

## Utility Company Contacts

**Below are contacts for some of the larger utility companies in California:**

- **Pacific Gas and Electric (PG&E)**: utilitycoordination@pge.com
- **So. Cal. Edison**: Manager of Land Acquisition Services and Government Lands – (800) 655-4555
- **San Diego Gas and Electric (SDGE)**: Michael Daleo – (858) 654-8530
- **Visit CALFIRE's Utility Contact List for other utilities throughout the state:** https://34c031f8-c9fd-4018-8c5a-4159cdff6b0d-cdn-endpoint.azureedge.net/-/media/calfire-website/what-we-do/natural-resource-management/forest-practice/contacts/utility-contact-list.pdf?rev=f57058467ca446f2a13100a410ef8cdc&hash=6BA434542084E50C9567939A81BF6CD3.

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