DOUGLAS ELECTRIC COOPERATIVE

Douglas Electric Cooperative

Wildfire Mitigation Plan

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Douglas Electric Co-op Wildfire Mitigation Plan

SECTION 1. PLAN OBJECTIVES

Establish operations, maintenance and construction practices and standards to minimize the risk of the Douglas Electric Cooperative's (DEC) electric distribution and transmission facilities potential involvement in a wildfire.

SECTION 2. OVERVIEW

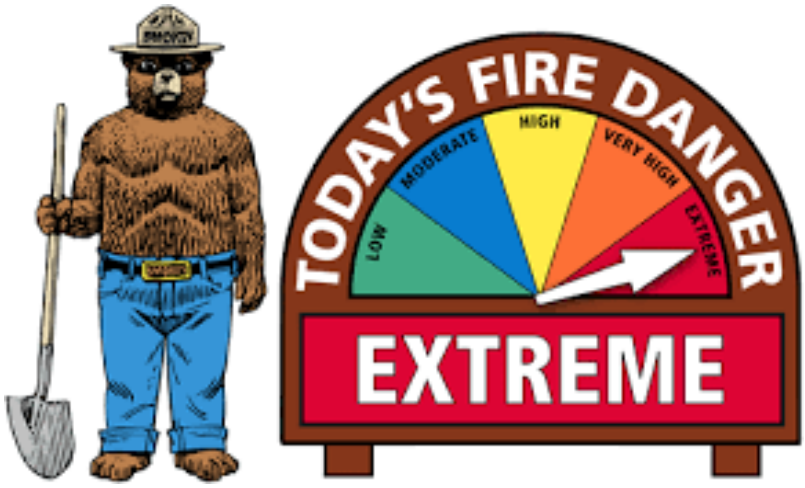
To meet this objective, while still providing safe and reliable power to our members, DEC will document and evaluate existing wildfire mitigation practices. The Wildfire Mitigation Plan (WMP) addresses the following categories:

A. Electric plant ignition risk assessment and actions – this assessment will examine electric plant components and assemblies, their condition and wildfire risks associated with the same. While it has a geographic component, this evaluates individual pieces of equipment.

B. Geographic area wildfire risk assessment and actions – this assessment focuses on risk factors unique to the diverse terrain, and vegetation types across Douglas, Coos, and Lane counties. It also includes a feeder assessment specific to each area.

C. Climate risk and actions – uses historic weather trends, fire risk data, and real time information from the National Weather Service, local fire response agencies and other community partners to assess risk.

Generally, Douglas Electric Cooperative expects the annual fire season to begin around mid-June and will adjust its plan based on precipitation to date and associated vegetation growth; forecast precipitation; associated wind events; other climate and weather factors.



SECTION 2 RISK ASSESSEMENT AND OPERATIONS OF/IN HFRA

DEC will evaluate its risk on an ongoing basis based on three key elements:

1. **Electric Plant Assessment**
   A. Patrol and inspect 50% of its electric plant for potential fire risk every year. It will generate service orders to respond to identified issues and give priority to any deemed as having significant fire-starting potential.

   B. Examine and upgrade overhead and underground facilities based upon the wildfire risks identified in the risk assessment.

   C. Evaluate the benefits of rebuilding underground for fire mitigation when an overhead line replacement is planned due to age.

   D. Inspect the condition and age of all transmission and distribution facilities for repair, replacement, and upgrades.

   E. Consult the Long-Range Plan (LRP) to prioritize upgrades based on age and health of system components as well as fire risk area where the equipment is located. Fire risk posed by the equipment is then evaluated to determine if it will influence replacement timing.

   F. Contracted engineering staff will review the current Coordination study to evaluate protection measures and make recommendations for protection device schemes.

   G. Evaluate and implement new technology (trip-savers, non-expulsion fuse types, recloser settings, grid/fault monitoring, etc.) to mitigate fire ignition risk posed by the system.

   H. A Pole Inspection (PI) program to evaluate DEC's wood poles using visual and internal examination of the poles to identify and document damage or decay requiring remediation. DEC requires intrusive inspections for all poles at least 5-years old, or older, to be completed using a 10-year cycle. Intrusive inspections involve drilling into the pole's interior to identify and measure the extent of internal decay, if any. Inspectors will apply a preservative to poles that pass the inspections to reduce the likelihood of future decay when conditions warrant. Inspectors may also perform a visual inspection on poles that are in the inspection grid but that are younger than 15 years old to look for signs of obvious external damage. The inspector analyzes the integrity of the pole and classifies it for repair or replacement, as necessary.

   I. A facility Infrared (IR) Inspection program to perform occasional audits by air or ground-based infrared inspections of overhead distribution facilities. The infrared inspections are performed using infrared cameras (heat-sensing cameras), which may find deterioration-indicating conditions not visible to the human eye. IR inspections can detect a wide range of anomalies, including, but not limited to, failing switch and fuse contacts, poor connections, loose bushings, overloaded/failing transformers, and other issues that can result in component failure.

J. Substation inspections are conducted monthly to identify and mitigate fire ignition risk from substation equipment failure.

2. Geography Assessment

A. DEC has completed and will continuously update a threat assessment by feeder of locations exposed to the highest fire threat. This assessment will include terrain, vegetation, and history of fire potential. (See table 2.5b.) DEC will adjust it vegetation management and maintenance programs to prioritize work that decreases fire risk on the feeders with the highest risk profile.

B. DEC's existing Vegetation Management Program reduces wildfire risk and meets current laws and regulations. The benefits of this activity were included in DEC's assessment of baseline wildfire risk, but DEC did not evaluate the specific risk reduction resulting from this compliance activity as it is prescriptively required. In other words, the impact of this activity on drivers, outcomes, and consequences was not explicitly modeled.

C. DEC's expanded vegetation management effort will assess the structural condition of trees in HFRA that are not dead or dying but could fall into or otherwise impact electrical facilities. These trees may be as far as 200 feet away from DEC's electrical facilities. Trees determined to pose a potential risk to electrical facilities due to their structural or site condition will be removed or otherwise addressed, where feasible.

3. Climate Assessment

A. DEC will continuously monitor the NWS for weather conditions that could lead to an escalated threat of wildfire. It will also monitor how the climate effects the IFPL level.

B. DEC conforms to the Industrial Fire Precaution Levels (IFPL) I, II, III, IV as identified by the local fire protection districts.

   a. Level I - Fire Season – Fire precaution requirements are in effect.
   b. Level II - Limited Shutdown – Only certain operations may continue between the hours of 8 pm – 1 pm.
   c. Level III - Restricted Shutdown – Only certain operations may continue between the hours of 8 pm – 1 pm where mechanized equipment capable of constructing a fire line is immediately available to quickly reach and effectively attack a fire start.
   d. Level IV - Complete Shutdown – All operations are prohibited.

C. Operations staff use the IFPL information to assist in the evaluation of potential fire risk based upon affected area. Fieldwork is modified based upon the current prescribed fire level within that area. (See table 2.5a)

Table 2.5a. MATRIX OF ACTIONS BY IFPL FIRE RATING

Matrix of fire danger ratings and descriptions

Fire Danger Ratings

Fire Danger Rating	Wind Parameters	Timber land	Cross Country	Gravel Rd	Paved Road	Farm Land
IFPL IV. Complete Shut Down		4	4	4	4	4
IFPL III. Restiricted Shut Down	*<15 mph	3	3	3	3	3
IFPL II. Limited Shut down	*<15 mph	2	2	2	2	2
IFPL I. Fire Season	*<15 mph	1	1	1	1	1

*Wind speed in excess of the listed speed would cause the Fire Danger Rating to advance to the next higher level.

**Road: For purposes of this document, a road must be improved by either pavement or base course; a two-wheel rut path is not considered a road.

1. Fire season requirements are in effect need basic fire tools
2.Limited Shutdown, Need permit and basic fire tools , depending on surroundings may need fire wagon
3. Restricted Shutdown, need permit and fire wagons

4.Complete Shutdown, Switches in Substations should be put on non-reclose, First responders located in key areas, if switch is tripped, complete line patrol to find problem, if re-energized it is still in the non-reclose position

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Table 2.5b. Threat Matrix by Feeder

1-Low 2-Moderate 3-High		Tenmile Substation			Melrose Substation			Oakland Substation				Elkton Substation			Scottsburg Substation		Reedsport Substation	Gardiner Substation	Drain Substation			Yoncalla Substation			Lookingglass Substation			Camas Substation			Umpqua Substation			Fair Oaks Substation			69 KV								
Conditions at Feeder	Source	Ollala Feeder 1	Tenmile Feeder 2	Lookingglass Feeder 3	Umpqua Feeder 6	Lookingglass Feeder 7	Elgarose Feeder 8	Kellogg Feeder 9	Oakland Feeder 10	Greenvalley Feeder 11	Oakhills Feeder 45	Tunnel East Feeder 12	Scottsburg Feeder 13	Kellogg Feeder 14	Scotteast Feeder 16	Scottwest Feeder 17	Reedsport Feeder 18	Smith River Feeder 19	Line 5 Feeder 22	Line 6 Feeder 22	Line 7 Feeder 22	Drain N/S Feeder 25	Scottsvalley Feeder 26	Yoncalla S Feeder 27	Reston Feeder 29	Lookingglass Feeder 30	Tenmile Feeder 31	Lower Camas Feeder 34	Tenmile Feeder 35	Upper Camas Feeder 36	Tyee Feeder 37	Melqua Feeder 38	Umpqua Feeder 39	Fair East Feeder 40	Fair North Feeder 41	Cooper Creek Feeder 42	LT	TC	LM	M	Line 5	F	DE	ES
Vegetation, (species,growth rate, density)	Patrol	2	2	2	2	2	2	2	2	2	1	2	2	2	2	3 BLM Forest service	2	2	3 5B	2	3 Upper Smith River	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2								
Accessibility (terrain, Ingress)	Patrol Maps	3	3	2	2	2	2	3	3	3	2	3	3	3	2	3	3	3	3	2	3	2	3	3	2	2	3	2	3	3	2	3	3	3	3	2	3	3	3	3	3	3	3	3
Outages (related to trees, limbs)	OMS	1	2	1	1	1	3	3	1	2	1	1	1	3	1	3	3	3	1	2	3	1	2	1	1	2	1	2	1	2	3	1	1	2	2	1	0	1	0	0	2	1	1	1
Fire Season (IFPL category)	DFPA	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Impact of wild fire (residential and/or critical infrastructure)	Cis	2	3	2	2	3	2	2	2	2	2	2	3	2	2	3	2	2	3	2	2	3	2	3	2	3	2	3	2	2	2	2	2	3	3	2	3	3	3	3	3	3	3	3
Wild fire risk	meso map	3	2	1	2	3 (2E)	1	1	1	1	1	1	1	1	1	1	2 (dump to the end)	1	1	1	1	1	2 Line 4 scottsvalley	1	1	2 2A Tap	1	2	2	2	2 3A1 tap	1	1	2 end of non-parriell	1	1	1	2	1	1	1	1	1	1	1
Overall Score		14	12	9	10	11	13	14	12	13	10	12	13	14	11	16	14	13	14	12	15	12	14	13	11	14	12	14	13	14	14	12	12	15	14	11	12	14	12	12	14	13	13	13
Score without CIS		12	10	7	8	9	9	12	10	11	8	10	10	12	9	13	12	11	11	10	13	9	12	10	9	11	10	11	11	12	12	10	10	12	11	9								
Rating with CIS		3	3	1	1	2	2	3	2	2	1	2	2	3	2	3	3	2	3	2	3	2	3	2	2	3	2	3	2	3	3	2	2	3	3	2								
Rating without CIS		3	2	1	1	1	1	3	2	2	1	2	2	3	1	3	3	2	2	2	3	1	3	2	1	2	2	2	2	3	3	2	2	3	2	1								
Total Rating		6	5	1	1	3	3	6	4	4	1	4	4	6	3	6	6	4	5	4	6	3	6	4	3	5	4	5	4	6	6	4	4	6	5	3								
Matrix Rating		3	3	1	1	2	2	3	2	2	1	2	2	3	2	3	3	2	3	2	3	2	3	2	2	3	2	3	2	3	3	2	2	3	3	2								
Meters (total number)		349	650	96	312	276	582	528	134	302	489	45	240	469	98	353	409	204	101	301	494	606	210	373	216	602	178	293	49	153	377	402	28	227	401	367								
Outages (last 5 years)		14	42	12	8	23	51	74	8	31	4	7	17	56	7	99 (9E 81)	75	49	24	34	70	25	26	11	24	26	8	34	6	31	53	19	2	31	42	8								
Cell Towers			1								1			1			1			1		1		1	3				1					1	4									

Conditions at Feeder	Scoring Criteria - may not meet all measures listed		
	1 - low Risk	2 - Moderate Risk	3 - High Risk
Vegetation, (species,growth rate, density)	Slow Growing not in lines	Moderate Growing, some areas in lines needs spot trimming	Fast growing multiple areas in lines
Accessibility (terrain, Ingress)	relatively flat paved roads feeder primarly in town	some hills/ravines moderate access parts of feeder in rural area	steep or ravine most of feeder in rural areas parts of feeder
Outages (related to trees, limbs)	0-25 outages	26 to 45 outages	46 to 98 outages
Fire Season (IFPL category)	mostly IFPL -1 days some IFPL -2 days	Multiple IFPL -2 days Few IFPL -3 days	Multiple IFPA-3 days some IFPL-4 days
Impact of wild fire (residential and/or critical infrastructure)	few residents no critical infrastructure	multiple residents some critical infrastructure	heavily populated critical infrastucture
Wild fire risk	low	Moderate	High
Score with CIS	9-10	11-13	14-15
Score without CIS	7-9	10-11	12-13
Matrix Rating	1-2 Low	3-4 Medium	5-6 High

SECTION 3. OPERATION PRACTICES

At the approach of fire season each year as fire precaution levels increase, the operations department adjusts work practices and system operations. These adjustments are coordinated with the IFPL and escalate with the increasing wildfire danger. Some practices are intended to mitigate risk of fire ignition while others are in place to control and extinguish an accidental fire before it grows out of control.

A. All DEC field personnel have CFPA required fire suppression equipment on-site during fire season.

B. During high fire risk DEC locates its 500-gallon fire wagons adjacent to field work.

C. During elevated fire levels, DEC field personnel have backpack water cans, shovels, and other firefighting equipment. This equipment provides additional fire suppression capability when crews are working in off-road locations.

D. DEC field personnel receive annual OSHA training/refresher course on wildland fire fighting.

E. Protective relays at the sub-station are normally set to "reclose" following a fault on the system. This automatically restores power if the cause of the fault was temporary. During fire season protective relay settings are changed to be more sensitive and to limit or inhibit automatic reclosing. This limits the possibility of an automatic reclosing operation igniting a fire. Line inspections will be performed during an event prior to re-energizing line.

F. Operations personnel monitor the weather daily for local fire levels and the National Weather Service for red flag warnings during fire season.

G. Contract tree crews can transition to work in low-risk areas that typically become high fire danger areas during fire season.

H. DEC field personnel are restricted to the use of battery and hydraulic powered tools when the IFPL reaches Level III, except for emergencies involving large trees.

I. Off-road work during fire danger periods will be limited according to DEC's Fire Season Working Prescription as submitted to the local fire district.

J. Crews remain on alert for fires or possible fire ignition sources while working in or passing through fire hazard areas and fires are accurately reported to the appropriate switching or control center as soon as possible.

K. Circuit breakers and reclosers protecting the portions of circuits traversing through HFRA are set to not automatically re-energize following initial activation until the RFW expires and/or elevated fire weather conditions sufficiently abate. In the event protective relays on these circuit breakers operate to interrupt the flow of electricity, the line is not re-energized until the line is patrolled and deemed safe.

L. During an RFW or other elevated fire weather threat, if a distribution or transmission line

section in the HFRA experiences a fault and the line relays, it is not re-energized until patrolled. A patrol, while operating restrictions are in effect, includes a visual check of all overhead main line and branch line conductors and equipment. A line section may be isolated and re-energized after a patrol with no cause found. Subsequent line sections may then be patrolled, isolated, and re-energized until the faulted line section is found and cleared or the entire line and equipment has been patrolled.

M. Once the patrol has been completed, whether the problem was found and isolated or there was no cause found, the line or line section recloser remains non-automatic until the Red Flag Warning (RFW) expires, or other elevated fire weather conditions sufficiently abate. This additional patrolling may cause longer outages for customers but is required for safety reasons prior to re-energization.

SECTION 4. PUBLIC SAFETY POWER SHUTOFF

The Public Safety Power Shutoff (PSPS) is a strategy being used by electric utilities to keep the public safe during hot, dry, and windy conditions. Power lines are preemptively de-energized during these conditions to keep a downed line from igniting a wildfire. The PSPS may be initiated by the distribution utility or a transmission provider serving that utility.

To implement a PSPS, DEC would first assess the risks and possible consequences of a PSPS. All the while attempting to meet its main priority of protecting communities and members.

Some key factors when considering a PSPS:

A. The loss of electricity at pumping stations and wells may result in a possible loss of water supplies to fight wildfires.
B. In the event of an extended power outage, disruptions to the internet and mobile phone service may negatively impact emergency response and public safety.
C. A negative impact on medical facilities.
D. The public evacuation in de-energized areas can cause traffic congestion, which can delay emergency responders.
E. In the event of a wildfire, it can be dangerous not to be able to open garage doors or motorized gates.
F. Request by community partners and fire officials as well as other.

In most cases, DEC believes the risks of implementing a PSPS outweigh the chances of its electric overhead distribution system igniting a catastrophic wildfire. However, the PSPS provides a last resort tool and another option in a crisis.

On a case-by-case basis, the company has historically de-energized part of its system to respond to an emergency management/response request or when a known public safety issue arises and will continue to do so.

In the event DEC or its transmission providers initiate a PSPS, DEC will attempt multiple communications through traditional media, social media, direct phone calls, and contact through community emergency organizations. The number of attempts may be limited by the notification that DEC receives of the PSPS initiated by others, or how quickly the conditions escalate to require DEC to initiate a PSPS itself.

To continue to refine its evaluation of this important topic, DEC will monitor the evolution of PSPS implementation by other Oregon electric utilities.

APPENDIX A: DEFINITIONS

Commission: Oregon Public Utility Commission

Fire Hazard: Hazard is based on the physical conditions that give a likelihood that an area will burn over a 30 to 50-year period without considering modifications such as fuel reduction efforts.

Fire Risk: "Risk" is the potential damage a fire can do to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers, and ignition resistant building construction, which can reduce fire risk. Risk considers the susceptibility of what is being protected.

Flashover: A type of fault or short circuit caused by a lightning strike to a live electrical system. Faults can occur anywhere along power lines – at transformers, poles, towers, and substations. Arcing from flashovers can cause extensive damage to electrical equipment, even more so than the lightning that caused them.

Hardening: Modifications to electric infrastructure to reduce the likelihood of ignition and improve electrical assets' survivability.

High Fire Threat Area (HFTA): The HFTA identifies areas of an elevated and high fire risk related to electric utility facilities.

Industrial Fire Precaution Level (IFPL): Activated when needed during the summer fire season, IFPL is an activity closure system to reduce wildfire risk. By law, it applies to workers in the woods and other industrial forest users on 13 million acres of unimproved private and state forestlands protected by the Forest Service. Levels range from Level-1 to Level-4.

Readily Climbable: Vegetation having both of the following characteristics

a. Low limbs, accessible from the ground and sufficiently close together to climb by a child or average person without using a ladder or other special equipment; and
b. A main stem or major branch that would support a child or average person either within arms' reach of an uninsulated energized electric line or within such proximity to the electric

line that the climber could be injured by direct or indirect contact with the line.

Point(s) of Delivery (POD): Points on the transmission provider's transmission system where capacity and energy transmitted by the transmission provider is made available to the receiving party.

Recloser: Recloser is a device used in electric distribution systems to interrupt the circuit to clear faults. Automatic reclosers may have electronic controls and vacuum interrupters that automatically recloses to restore service if a fault is temporary. Several attempts may be made to clear and re-energize the circuit, and if the fault still exists, the recloser locks out. Reclosers are made in single-phase and three-phase versions and use oil or vacuum interrupters.

Red Flag Warning (RFW): A term used by fire-weather forecasters to call attention to limited weather conditions of importance may result in extreme burning conditions. It is issued when it is an on-going event, or the fire weather forecaster has a high degree of confidence that Red Flag criteria will occur within 24 hours of issuance. Red Flag criteria can happen whenever a geographical area is in a dry spell for a week or two, or a shorter period if before spring green-up or after fall color. Also, when the National Fire Danger Rating System (NFDRS) is high to extreme, and the following forecast weather parameters met:

- A sustained wind average of 15 mph or greater
- Relative humidity less than or equal to 25 percent and
- A temperature of greater than 75 degrees F

In some states, dry lightning and unstable air are criteria. A Fire Weather Watch may be used before the RFW.

Readily Climbable: Vegetation having both of the following characteristics:

- Low limbs, accessible from the ground and sufficiently close together so that a child or average person can climb the vegetation without using a ladder or other special equipment; and
- The main stem or major branch would support a child or average person either within arm's reach of an uninsulated energized electric line or within such proximity to the electric line that the climber would be injured by direct or indirect contact with the line.

SCADA: Is an acronym for Supervisory Control and Data Acquisition. SCADA generally refers to an industrial computer system that monitors and controls a process. In the transmission and distribution elements of electrical utilities, SCADA will monitor substations, transformers, and other electrical assets. It is possible to control or reset equipment remotely using SCADA.

Substation: Part of the electrical generation, transmission, and distribution system, substations transform voltage from high to low, or the reverse, or perform any other essential functions. Between the generating station and consumer, electric power may flow through several substations at different voltage levels. A substation may include transformers to change voltage levels between high

transmission voltages and lower distribution voltages or at the interconnection of two different transmission voltages.

Transmission and Distribution (T&D): At DEC, for line maintenance purposes, the transmission system includes 69 kV lines tied to points of delivery. The distribution system includes 12 kV and 13.8 kV lines not connected to points of delivery.

Utility Cooperative: A cooperative tasked to deliver utilities such as electricity, water, or telecommunications to its members. Profits are either reinvested for infrastructure or distributed to members in the form of "patronage" or "capital credits," which are dividends paid on a member's investment in the cooperative. Each customer is a member and owner of the business, meaning all members have equal individual authority, unlike investor-owned utilities.

Vegetation: Trees, shrubs, and any other woody plants.

Vegetation Management: A broad term that includes tree pruning; brush removal using power saws and mowers; the judicious use of herbicides and tree growth regulators; hazard tree identification and removal; the implementation of strategies to minimize the establishment of incompatible species under and near power lines; and the control of weeds.

Wildfire: Also called wildland fire, uncontrolled fire in a forest, grassland, brushland or land sown to crops. Fire danger in a wildland setting varies with weather conditions: drought, heat, and wind participate in drying out the timber or other fuel, making it easier to ignite. Once a fire is burning, drought, heat, and wind all increase its intensity. Topography also affects wildfire, which spreads quickly uphill and slowly downhill. Dried grass, leaves, and light branches are considered flash fuels. They ignite readily, and fire spreads quickly in them, often generating enough heat to ignite heavier fuels such as tree stumps, heavy limbs, and the forest floor's organic matter. Such fuels, ordinarily slow to kindle, are difficult to extinguish. Green fuels-growing vegetation-are not considered flammable, but an intense fire can dry out leaves and needles quickly enough to allow ready ignition. Green fuels sometimes carry a special danger: evergreens, such as pine, cedar, fir, and spruce, contain flammable oils that burst into flames when heated sufficiently by the searing drafts of a forest fire.

Wildfire Mitigation Plan (WMP): A comprehensive plan to reduce the threat and severity of wildfire within an electric utility's service area. A WMP includes preventive strategies and programs adopted by the utility to minimize the risk of its facilities causing wildfires and emergency response and recovery procedures.

Wildlands: Forests, shrublands, grasslands, and other vegetation communities have not been significantly modified by agriculture or human development. Fire managers follow the National Wildfire Coordinating Group (which coordinates programs of participating wildfire management agencies nationwide) more specific definition. It refers to an area in which development is nearly non-existent (except for roads, railroads, power lines, and similar transportation facilities); structures, if any, are widely scattered.

APPENDIX B: ACRONYM GLOSSARY

BPA	Bonneville Power Administration
DEC	Douglas Electric Cooperative
GF	General Foreman
HFRA	High Fire Risk Area
IRIP	Infra-Red Inspection Program
IFPL	Industrial Fire Protection Level
OH	Overhead
PSPS	Public Safety Power Shutoff
RFW	Red Flag Warning
ROW	Right of Way
T&D	Transmission and Distribution
WMP	Wildfire Mitigation Plan