Harney Electric Cooperative Wildfire Mitigation Plan

NEVADA RURAL ELECTRIC ASSOCIATION

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BKI ENGINEERING SERVICES

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1 Introduction

This plan was developed to be consistent with industry best management practices. While WMP regulations are under development and vary by state, the plans in general are likely to direct utilities to develop operational policies and practices to prevent, prepare for, and respond to wildfire events. WMPs are likely to be evaluated or updated on an annual basis and may be subject to board approval.

Fire mitigation plays an essential role in HEC's operational practices. The Co-op's existing policies, programs and procedures directly or indirectly manage or reduce this risk. Over the years, HEC has adopted additional fire mitigation programs to adjust to changes in fire-related conditions, adopted technological advances, and improved operational practices to further mitigate the potential for ignitions and more effectively respond to high wildfire risk conditions.

1.1 Objectives of the WMP

The main objective seeks to implement an actionable plan to create increased reliability and safety while minimizing the probability that HEC assets may be the origin or contributing factor in the ignition of a wildfire. All programs and strategies will comply with current and anticipated Nevada and Oregon State law, and National Electric Safety Code (NESC) regulations and guidelines. To help develop the Plan, HEC assessed new industry practices and technologies that will reduce the likelihood of an interruption in service and reduce an outage's duration.

The secondary objective is to assess, the effectiveness of the specific wildfire mitigation strategies as they apply to HEC. When a particular action, program component, or protocol proves unnecessary or ineffective, HEC will modify or replace action as appropriate.

1.2 Utility Profile and History

Harney Electric Cooperative is headquartered in Hines, Oregon. HEC has a district office in Orovada, Nevada, and a satellite office in Fields, Oregon. HEC is an electric transmission and distribution cooperative that serves over 20,000 square miles in southeast Oregon and northern Nevada. The coop was founded in 1954 to provide power to rural farmers and ranchers in the region. HEC serves approximately 4,000 meters with 401 miles of transmission line and 2,612 miles of distribution line spanning across Harney, Malheur, Deschutes, Crook, and Lake counties in southeast Oregon, and Humboldt County in northern Nevada.

HEC is a member-owned cooperative. Its policies are established by a seven-person Board of Directors. Each board member is a bill-paying, residential member elected by fellow members. The Cooperative has a system average one consumer for every two miles of power line, or one consumer for every sixteen square miles of service area.

HEC has 21 full time employees with 11 of them being Lineman. HEC is led by a General Manager who is hired by the Board of Directors.

1.3 The Service Area

HEC's main office is in Hines, Oregon. HEC is in Oregon Trail Electric Cooperatives service territory and as such, HEC is a member of Oregon Trail Electric Cooperative. HEC's service territory starts about five miles out of the towns of Burns and Hines.

HEC serves members in multiple states, Oregon and Nevada. HEC serves the counties of Harney, Malheur, Deschutes, Crook, and Lake counties in southeast Oregon, and Humboldt County in northern Nevada.

The majority of HEC's infrastructure is in Harney County Oregon.

Much of Harney County's population comes from the rural towns and surrounding areas of Crane, Drewsey, Frenchglen, and Riley. Because Harney County is so large, these small towns (all have populations of less than 500) are each at least one to two hours away from each other. The residents of these small rural communities have very little in way of supplies and must drive to Burns or to the "neighboring" cities of Bend or Ontario to get their basic necessities. Burns is the largest town in Harney County with a population of it combined with Hines to nearly 5000.

Harney County is situated in the southeastern corner of Oregon. Harney includes the furthermost northwestern tip of the Great Basin. The county is geographically in the Pacific Northwest, although it represents little of what many people imagine the region to be like. The western side of the Cascade Mountain Range is the part of the state that many people think of when speaking of Oregon; very wet, green, and lush. However, the Cascades create a very large block on clouds carrying precipitation, thus making the eastern side of the Cascades much drier and arid. This further explains why Harney County is in the High Desert, that, and the fact that much of the region is above 4000 to 5000 feet above sea level.

Harney County covers vast amounts of land from Nevada and halfway up to Washington. The county is one of the largest in the US, covering 10,228 square miles, an area that is larger than some East Coast states. The geography of the county is very diverse, but a common trait is that it is very arid. At the southern end of the county, it is much like a desert, hence the name High Desert.

Harney County is accessible in 4 different directions by highway. From Bend, Highway 20 east will lead here and west from Ontario on Highway 20. Highway 395 from John Day and Pendleton comes in from the north. Highway 395 comes up from the south from Lakeview and Klamath Falls. The final main highway that comes into Harney County is 78. Highway 78, which becomes Highway 95 just south of Burns Junction, comes up from the south from Winnemucca Nevada. Burns also has a small airport that can accommodate small planes and small passenger planes.


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1.4 The Electric System

HEC owns and operates around 401 miles of transmission line and 2,612 miles of distribution line. Most of the transmission lines are of the H structure framing and are energized at 115kV. A small portion of transmission from Fields Switch to Quinn River substation are single pole structures with distribution under-build. Most of the distribution lines are three phase lines energized at 14.4/24.9kV and framed with the RUS specifications for wood pole construction.

HEC purchases all its power from Bonneville Power Administration. BPA generates hydro power and delivers it to HEC through three points of delivery. HEC's northern feeds are fed into BPA's Harney sub in Burns, Oregon, and at a Riley point of delivery. HEC's southern feed is fed through a transfer agreement between BPA and NV Energy and is delivered to HEC out of the Winnemucca substation.

HEC operates 12 substations and 5 switching stations. HEC has a summer peaking load because of the irrigation pump load on the system.

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2 Overview of Utility's Fire Prevention Strategies

HEC is focused on the following wildfire prevention strategies.

- Design & Construction
- Inspection & Maintenance
- Operational Practices
- Situational & Conditional Awareness
- Response & Recovery

2.1 Timeframes of Preventative Strategies and Programs

The components described above have several strategies and programs, most of which have already been implemented and are ongoing. Some are situational and are not limited to any timeframe. Some programs are scheduled to be completed over several years, while others are in the evaluation or proposal stages. The strategies and programs below fall into one or more of the five implementation timeframes:

- A: Currently implemented
- B: Implemented before the upcoming fire season
- C: Completed annually or on schedule per relevant code
- D: In evaluation stage
- E: Implemented on as-needed basis/protocols in place
- * Ongoing program with no defined completion date

Table 1. Mitigation Programs/Activities

DESIGN AND CONSTRUCTION	TIMEFRAME
Underground distribution lines	D
Increased phase spacing reducing wire to wire contact	A*
Exposed jumpers covered with insulated non-conductive tubing	A*
Identify Available fault current	A
Avian Protection Program	A*
INSPECTION AND MAINTENANCE	**TIMEFRAME**
Transmission line ground patrols	A*
Wood pole inspections	A*
T&D vegetation right-of-way (ROW) maintenance	E*
T&D pole clearing program	E*
Distribution system line patrols and detailed inspections	A*
Drone inspection program	D
Infrared substation inspections	A*
OPERATIONAL PRACTICES	**TIMEFRAME**
T&D system vegetation management program	A*
Enhanced ROW clearing in high-risk areas prior to fire season	B
Existing relationship with local government and fire safety councils	A

SITUATIONAL/CONDTIONAL AWARENESS	TIMEFRAME
Weather Monitoring (USFS-WFAS, NWS, Oregon Risk Explorer)	E*
Safety training and orientation for T&D vegetation management work	C*
Coordination with Forest Service and land management agencies	A*
RESPONSE AND RECOVERY	**TIMEFRAME**
Line patrols prior to re-energization	B*
Emergency Response Plan	A*

3 Risk Analysis and Risk Drivers

To establish a baseline understanding of the risks and risk drivers involved, HEC looked at aspects of HEC's exposure to fire related hazards. Although there are inherent risks in the operation of an electric utility, it is possible to put in place strategies and processes to better plan and manage them. Enterprise Risk Management is one tool to assist in anticipating and managing risks, as well as considering how multiple risks can present even greater challenges.

3.1 Fire Risk Drivers

HEC staff evaluated other utility's fire causes and applied its own field experience to determine the critical potential risk drivers. The categories listed below were identified as having the potential for causing powerline sparks and ignitions:

- Equipment/Facility Failure
- Foreign Contact
- Vehicle Impact
- Standard Expulsion Fuses
- Vegetation Type/Fuels
- Lightning
- Tree Contact
- Fire Weather/Red Flag Warning

The impacts associated with these risk drivers are discussed in the following sections.

3.2 Key Risk Impacts

The aforementioned risks have many possible outcomes. The list below outlines some of the worst-case scenarios and consequences:

- Personal injuries or fatalities to the public, employees, and contractors
- Damage to public and/or private property
- Damage and loss of HEC owned infrastructures and assets
- Impacts to reliability and operations
- Damage claims and litigation costs, as well as fines from governing bodies
- Damage to HEC's reputation and loss of public confidence

4 Utility Asset Overview

Power is provided to HEC customers by way of bulk substations, overhead transmission line, and overhead and underground distribution line assets. The utility has its headquarters office and warehouse in Hines, Oregon.

Table 2 depicts a high-level description of HEC's T&D assets.

Table 2. Asset Overview

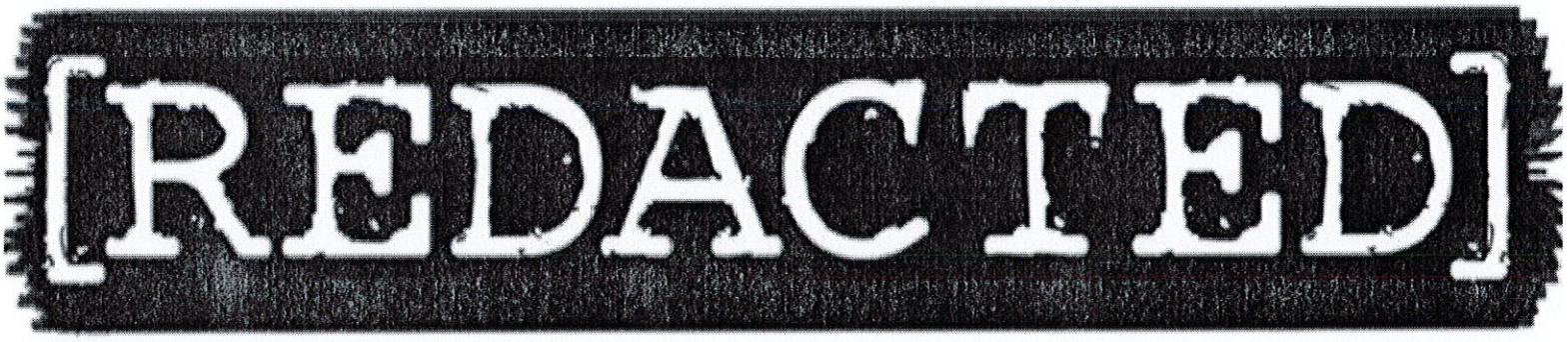
ASSET CLASSIFICATION	ASSET DESCRIPTION
Transmission Line Assets	Approximately 401 miles of conductor, transmission structures and switches at 115 kilovolts (kV).
Distribution Line Assets	Approximately 2,612 miles of overhead (OH) and 5.5 miles of underground (UG) conductor, cabling, transformers, voltage regulators, capacitors, switches, lined protective devices operating at or below 24.9kV.
Substation Assets	Major equipment such as power transformers, voltage regulators, capacitors, reactors, protective devices, relays, open-air structures, switchgear and control houses in 17 substation facilities.

4.1 Fire Threat Assessment in Utility Service Territory

Being in the arid high desert of Oregon and Nevada, HEC's service territory is almost completely barren of tall trees. None of HEC's infrastructure extends through densely covered forest. HEC's territory is mostly spread out over large amounts of sagebrush covered landscape. The only trees and vegetation that pose a risk for a fire threat, are trees located at residential locations. HEC has, as part of its WMP, been locating and re-routing power lines out and away from any trees in these areas where possible.

As part of the risk analysis process, HEC hired B&K engineering to identify the high-risk areas on its electrical system. Because of the factors that are included in a high-risk rating determination, HEC has a very limited amount of infrastructure in this class. Most of HEC's system is identified as low and medium risk for wildfire hazard potential.

Another risk factor considered was population density. As the largest county in Oregon with a small population, Harney County's population density is very low with 1.4 people per square mile.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4.2 Fire Threat Assessment Mapping

A key element of the WMP is the wildfire risk mapping used to determine the areas of the service territory that have increased potential for wildfire. These areas contain risk factors such as extreme topography, fuels accumulation, vegetation types, tree mortality, etc. The maps are used to identify areas that may require enhanced vegetation management, shortened inspections intervals, alternative inspection methods or equipment replacement.

The wildfire risk maps are derived from a 270- meter resolution raster geospatial product created by the USDA/USFS, Fire Modeling Institute. The specific dataset used is the Wildfire Hazard Potential[1] (WHP), Version 2018[2]. The 2018 WHP publication is the second edition of the WHP product and depicts landscape conditions of the conterminous United States as of 2012. It was built upon spatial datasets of wildfire likelihood and intensity using the Large Fire Simulator (FSim), as well as spatial fuels and vegetation data from Landfire 2012 and point locations of historic fire occurrence (ca. 1992-2013). The objective of the map was to depict relative potential for wildfire that would be difficult for suppression resources to contain and for long-term strategic fuels management planning.

In order to determine fire threat levels within HEC's service area, the transmission and distribution system is overlaid on the WHP maps shown in Figures 2 through 4. T&D assets can be seen in relation to the WHP zones shown in color-coded overlays.

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[1] Product citation: *Dillon, Gregory K. 2015. Wildfire Hazard Potential (WHP) for the conterminous United States (270-m GRID), version 2018 continuous. 2nd Edition. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2015-0047*

[2] *Versions prior to 2014 were known as the Wildland Fire Potential map. The FSim products used to create the 2018 version of WHP can be found in Short et al. 2016. Dillon, Gregory K.; Menakis, James; Fay, Frank. 2015.*


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4.2.1 Assets Within Wildfire Hazard Potential High Risk Zones

Table 3 provides a high-level overview of the location of HEC's assets within the Wildfire Hazard Potential (WHP) High Risk zones.

Table 3. Overview of T&D Assets in WHP High Risk Zones

Assets	Total	High Risk	
	Line-miles	Line-miles	%
115 kV OH Transmission	401	12.75	3.2%
14.4/24.9 kV OH Distribution	2,612	31.43	1.2%
14.4 kV UG Distribution	5.5	0	0%
Substations (17)	.68	0	0%
Total Line Miles	3,019.18	44.18	1.5%

5 Wildfire Prevention Strategy and Programs

5.1 Transmission and Distribution System Operational Practices

5.1.1 De-energization - Public Safety Power Shutoff

A Public Safety Power Shutoff (PSPS) preemptively de-energizes power lines during high wind events combined with hot and dry weather conditions. When considering de-energization, HEC examines the impacts on fire response, water supply, public safety, and emergency communications.

HEC considers the external risks and potential consequences of de-energization while striving to meet its main priority of protecting the communities and members we serve. They include:

- Potential loss of water supply to fight wildfires due to loss of production wells and pumping facilities.
- Negative impacts to emergency response and public safety due to disruptions to the internet and mobile phone service during periods of extended power outages.
- Loss of key community infrastructure and operational efficiency that occurs during power outages.
- Medical emergencies for members of the community requiring powered medical equipment or refrigerated medication. Additionally, the lack of air conditioning can negatively impact medically vulnerable populations.
- Negative impacts on medical facilities.
- Traffic congestion resulting from the public evacuation in de-energized areas can lengthen response times for emergency responders.
- Negative economic impacts from local businesses forced to close during an outage.
- The inability to open garage doors or motorized gates during a wildfire event can lead to injuries and fatalities.

The risks and potential consequences of initiating a PSPS are significant and extremely complex. Based on the above considerations, HEC reserves the option of implementing a PSPS when conditions dictate. While HEC believes the risks of implementing a PSPS far outweigh the chances of its electric overhead distribution system igniting a catastrophic wildfire, the PSPS provides a last resort tool and another mitigation option.

On a case-by-case basis, HEC has historically and will continue to consider de-energizing a portion of its system in response to a known public safety issue or response to a request from an outside emergency management/response agency. Any de-energizing of the lines is performed in coordination with key local partner agencies keeping all parties' best interests in mind.

If conditions on the ground indicate that a wildfire threat is imminent, HEC's Operations and Engineering depts. have the authority to de-energize select distribution circuits. A decision is based on multiple factors accompanied with the unique understanding of HEC's system, including any enterprise risks involved. No single element is determinative. HEC relies on weather data from various sources, including the National Weather Service, Oregon Wildfire Risk Explorer, and the USFS Wildfire Assessment System, as well as observations from field personnel.

HEC will continue to monitor the evolution of PSPS implementation by other Nevada and Oregon electric utilities to continue to refine its evaluation of this vital topic.

5.1.2 Recloser Operational Practices

HEC's Engineering dept. has put into place a system that makes it possible to change the settings of the substation reclosers from the main office via the SCADA system. If HEC decides to enter "Wildfire Mitigation Mode", the Operations and Engineering departments can place the affected areas on non-reclose remotely. The changing of the settings will be accomplished using a working document to track the setting changes. For the reclosers that are in the field with no communications available, Lineman would be dispatched to the affected area to set the reclosers in non-reclose manually.

5.1.3 Fire Season Restrictions

Activated when needed during the summer fire season, Industrial Fire Precaution Levels (IFPL) are an activity closure system to reduce wildfire risk. By law, it applies to woods workers and other industrial forest users on 13 million acres of unimproved private and state forestland protected by the agency. The other set of protections is aimed at the general public, but also

includes local residents, landowners, recreationists and forest workers. Wood workers are required to observe both sets of restrictions as fire danger dictates. Other land users only need to follow the public use restrictions.

DNR, U.S. Forest Service, Bureau of Land management and Bureau of Indian Affairs all use the same four-level industrial regulation system. This system, which helps prevent wildfires by regulating work in the woods, is known as the Industrial Fire Precaution Level (IFPL) system.

- Level 1 - Fire equipment and fire watch service is required.
- Level II - Limits certain activities to between 8 p.m. and 1 p.m.
- Level III - Prohibits some activities and limits others to between 8 p.m. and 1 p.m.
- Level IV - All operations are prohibited.

5.2 Infrastructure Inspections and Maintenance

Recognizing the hazards of equipment that operate high voltage lines, HEC maintains a formal inspection and maintenance program for distribution, transmission, and substation equipment. HEC has recently implemented a new inspection and maintenance program, called Protection Zone Management, to keep electronic records of all line patrol inspections, substation inspections, and deficiencies found. The Operations Manager and Line Superintendent oversee the time-based system inspection program. The Operations Manager oversees the wood pole inspection program. HEC currently patrols its system regularly and is increasing the frequency of inspections in high-risk areas. Table 4 summarizes the inspection schedule for all assets, while the following sections outline inspection practices for the utility.

Oregon PUC Rule (860-024-0011), Inspections of Electric Supply and Communications Facilities, states that the maximum interval between detailed inspections is ten years, with a recommended inspection rate of ten percent of overhead facilities per year.

Table 4. Inspection Program Summary

ASSET CLASSIFICATION	INSPECTION TYPE	FREQUENCY
Overhead Transmission	Patrol Inspection	Every Two Years
	Detailed Inspection	10% a year
	Wood Pole Test	10% a year
	Thermal Inspections	As needed
Overhead Distribution	Patrol Inspection	Every Two Years
	Detailed Inspection	10% a year
	Wood Pole Test	10% a year
	Thermal Inspections	As needed
Underground Distribution	Patrol Inspection	Every Two Years
Substation	Detailed Inspection	Monthly
ROW Vegetation Inspection	Detailed Inspection	Every Two Years

5.2.1 Definition of Inspection Levels

1. **Safety Patrol Inspection:** A simple visual inspection of applicable utility equipment and structures designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.
2. **Detailed Inspection:** Individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic testing, as appropriate.
3. **Wood Pole Inspection:** Using a sophisticated diagnostic tool to drill into pole at ground level to test wood density, and a visual inspection of the pole and hardware.

5.2.2 Routine Safety Patrol Inspection

HEC performs routine safety patrol inspections as required. Every service is inspected once a year for any hazards or deficiencies that could create a hazard to the public. Every feeder and line are inspected at least once every two years. HEC tries to maintain an inspection rate of 50% of it lines per year.

5.2.3 Detailed T&D Inspections

HEC performs detailed inspections as required. Every service is inspected once a year for any hazards or deficiencies that could create a hazard to the public. Every feeder and line are inspected thoroughly at least once every ten years. HEC tries to maintain an inspection rate of 50% of it lines every five years.

5.2.4 Deficiency Correction Priority Levels

The inspector will document the condition of the overhead and underground systems, recording defects, deterioration, violations, safety concerns or any other conditions that require attention. All inspections and defects will be recorded in the Protection Zone Management Application. Focus of the inspection shall be on any hazards that could affect the integrity of the system or the safety of line workers and the general public.

Necessary maintenance service orders resulting from inspections (overhead and underground) will be prioritized and issued as follows:

- Emergency!

Condition that is going to immediately or is currently affecting the integrity of the system or presenting a hazard to workers or the public. All Emergency tags will be responded to immediately and appropriate action taken until the hazardous condition is remedied.

- Priority # 1 - Critical

Conditions that may affect the integrity of the system or present a hazard to workers or the general public. All Priority #1 tags will be responded to as soon as possible and appropriate action taken until the hazardous condition is remedied.

- Priority # 2 - Major

Conditions that require maintenance that can be scheduled to maintain the integrity of the system. Priority #2 service orders will be prioritized by urgency and will be scheduled to have appropriate repairs made to correct the condition within a year where practicable.

- Priority # 3 - Moderate

Conditions that do not present a situation that could jeopardize the safety of the system, line workers and the general public. Priority #3 service orders will be submitted by the inspector with the time interval recommended. In the judgment of the inspector, work will be scheduled to be completed within two years.

- Priority #4 - Minor

Conditions that do not present a situation that could jeopardize the safety of the system, line workers and the general public. Priority #4 items are housekeeping issues that will be completed as HEC crews are in the affected areas and have time to make repairs.

5.2.5 Standards for Record-Keeping and Reporting

General Inspection Instructions: Facilities meeting standards and not requiring maintenance will be recorded as inspected in the PZM software and documented on the line patrol map. Conditions other than satisfactory will be documented in the PZM software and a deficiency will be created for any outstanding item that needs repair or correction. The deficiency list acts as a maintenance item list that the line crews oversee completing and documenting. The Operations Manager and Line Superintendent monitor the completion of repair work.

The inspector collects the following information at the time of inspection if a deficiency is found.

- Responsibility Area
- Name of inspector
- Date of inspection
- Location of asset
- Facility ID (Pole #)
- Damaged (yes/no)
- Work order priority # Emergency,1,2,3,4
- Chance of failure
- Feeder name
- Vegetation (trees that need trimmed)
- Labor Required
- Outage required
- Description of deficiency

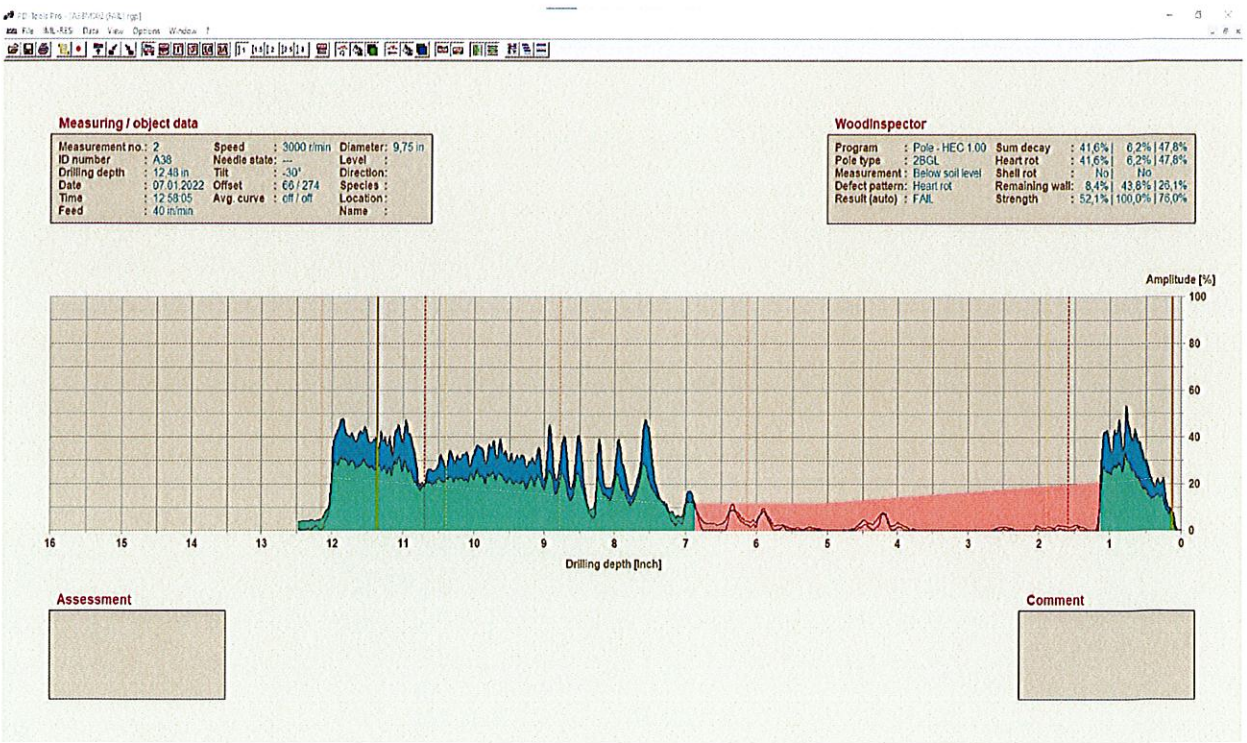
RUS 1730-1 also establishes records retention requirements for each level of inspection. The utility must retain records of patrol and detailed inspections for ten years and must retain records of pole inspections for the life of the pole.

5.2.6 Pole Testing and Inspection

HEC's pole testing and inspection program is an ongoing project and completed throughout the year as time permits by HEC employees. HEC employees use the IML resistograph drill with the wood inspector program to test wood pole densities and review auto generated graphs that show the pole inspection results.

HEC is in the high desert part of Oregon and Nevada, and is located in decay zone 1, (low decay hazard), of the AWPA decay hazard zone map. Being in decay zone 1, HEC has a very low failure rate as compared to other utilities in higher decay zone climates.

HEC's pole testing schedule is based on a ten-year cycle. HEC attempts to test around 3,000 poles per year. Records are maintained at HEC's headquarters in Hines, Oregon. If pole test fails, HEC will put on list to change out within one year. If the pole test is marginal, it will be put on a list to re-inspect in three years. Following is an example of a failed pole test result:



5.2.7 Substation Inspections

HEC's substation inspection protocols include a weekly safety inspection, and a detailed inspection every six months. All inspections are completed by HEC employees using the Protection Zone Management software. All yard, fences, and equipment are inspected during the weekly and monthly inspections. HEC uses the PZM software to maintain inspection records. Infrared and equipment oil tests are completed at each substation and switch station annually. Inspection records are reviewed by Operations Manager, Engineer, and Line Superintendent.

5.3 Vegetation Management (VM)

HEC employees perform all vegetation management tasks. The line crews are responsible for inspecting HEC's system and identifying infrastructure that needs maintenance or trimming. Any areas that have trees or reoccurring vegetation, are entered into the PZM software on a two-year trimming cycle.

5.3.1 Vegetation to Conductor Clearance

HEC will meet the minimum standards for conductor clearances from vegetation to provide safety for the public and utility workers, reasonable service continuity and fire prevention. As an operator of electric supply facilities, HEC's VM program will keep appropriate records to ensure that timely trimming is accomplished to maintain the designated clearances. These records will be made available for RUS O&M inspections upon request.

Patrols are scheduled to ensure all lines are inspected for vegetation hazards on a two-year timeline. The results of the patrols are targeted areas for vegetation pruning or removal.

The Oregon Public Utility Commission rules and regulations on vegetation clearance requirements are stated as follows:

Rule 860-024-0016

Minimum Vegetation Clearance Requirements

(1) For purposes of this rule:

(a) "Readily climbable" means vegetation having both of the following characteristics:

(A)Low limbs, accessible from the ground and sufficiently close together so that the vegetation can be climbed 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.

(b) "Vegetation" means trees, shrubs, and any other woody plants.

(c) "Volts" means nominal voltage levels, measured phase-to-phase.

(2) The requirements in this rule provide the minimum standards for conductor clearances from vegetation to provide safety for the public and utility workers, reasonable service continuity, and fire prevention. Each operator of electric supply facilities must have a vegetation management program and keep appropriate records to ensure that timely trimming is accomplished to keep the designated minimum clearances. These records must be made available to the Commission upon request.

(3) Each operator of electric supply facilities must trim or remove vegetation to maintain clearances from electric supply conductors.

(4) Each operator of electric supply facilities must trim or remove readily climbable vegetation as specified in section (5) of this rule to minimize the likelihood of direct or indirect access to a high voltage conductor by a member of the public or any unauthorized person.

(5) Under reasonably anticipated operational conditions, an operator of electric supply facilities must maintain the following minimum clearances of vegetation from conductors:

(a)Ten feet for conductors energized above 200,000 volts.

(b)Seven and one-half feet for conductors energized at 50,001 through 200,000 volts.

(c)Five feet for conductors energized at 600 through 50,000 volts.

(A)Clearances may be reduced to three feet if the vegetation is not readily climbable.

(B)Intrusion of limited small branches and new tree growth into this minimum clearance area is acceptable provided the vegetation does not come closer than six inches to the conductor.

(6) For conductors energized below 600 volts, an operator of electric supply facilities must trim vegetation to prevent it from causing strain or abrasion on electric conductors. Where trimming or removal of vegetation is not practical, the operator of electric supply facilities must install suitable material or devices to avoid insulation damage by abrasion.

(7) In determining the extent of trimming required to maintain the clearances required in section (5) of this rule, the operator of electric supply facilities must consider at minimum the following factors for each conductor:

(a)Voltage.

(b)Location.

(c)Configuration.

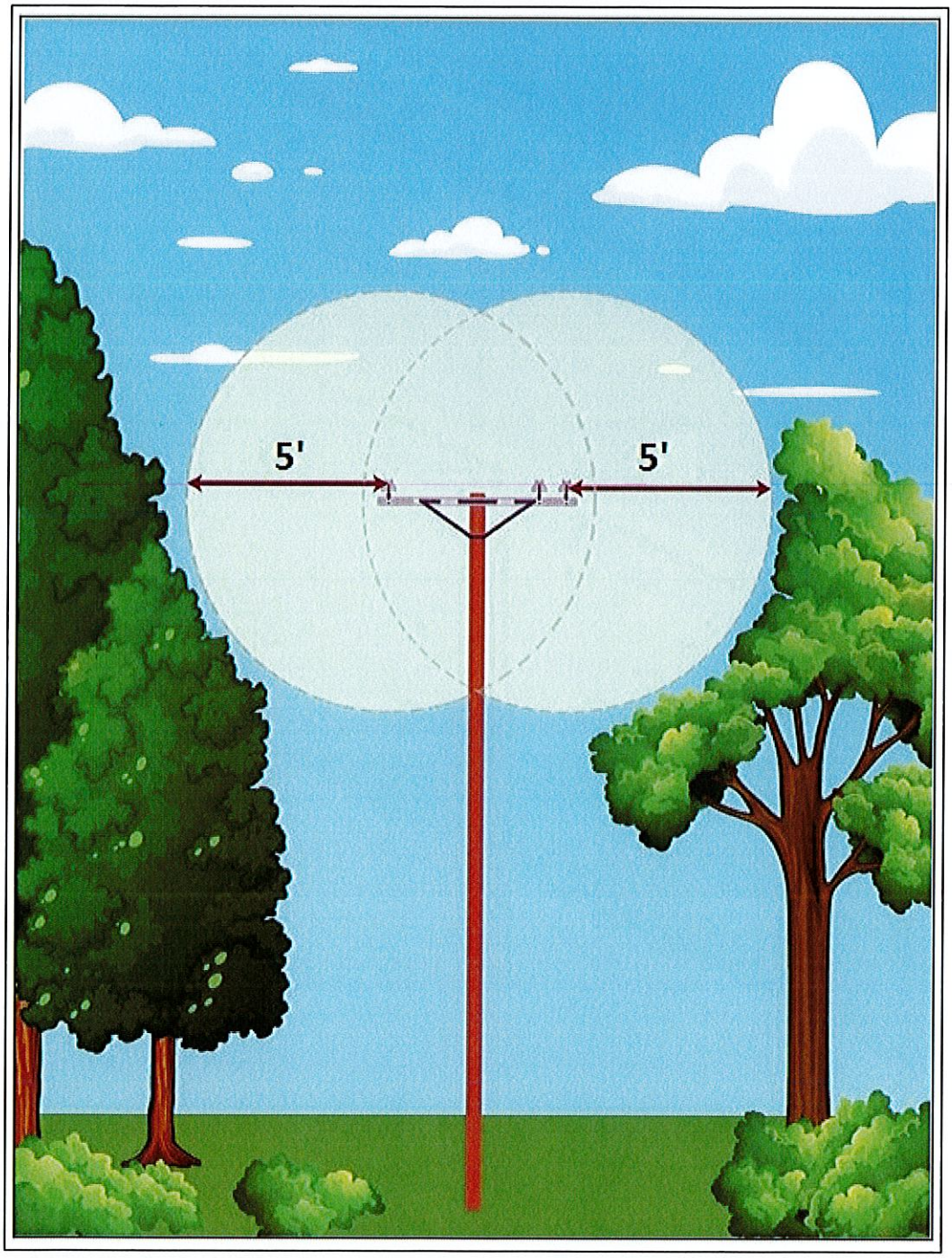
(d)Sag of conductors at elevated temperatures and under wind and ice loading; and

(e)Growth habit, strength, and health of vegetation growing adjacent to the conductor, with the combined displacement of the vegetation, supporting structures, and conductors under adverse weather or routine wind conditions.

Figure 4. Conductor Clearing Guidelines

OAR 860-024-0016

Five feet for conductors energized at 600 through 50,000 volts



5.3.2 Herbicide Applications

Unwanted weeds, trees and shrubs around substations not only impact the aesthetics of a town or suburb, but if vegetation is left untended, it can interfere or cause damage to equipment and pose a danger to employees and the public. An integrated vegetation management strategy in and around substations is also necessary to prevent a fire hazard.

Though substations range in size and complexity, they all require proper vegetation management for correct use and safety. The inside of these substations should be free of any weeds or shrubs and the yard should ideally be covered with gravel which conceals and protects a grid of wires that functions as the grounding for high voltage equipment. Should there be vegetation in the gravel it could interfere with the ground grid, seriously compromising the safety functions of the grid and posing an electrical hazard to workers.

The area outside of the substation should also be kept clear of all vegetation. Nearby trees can act as a fuel source for fire should an electrical spark or fire occur. Overhanging branches or large old trees can fall on to equipment and damage the site. It's advisable to remove these trees before they become too big and pose a serious risk to the substation and its employees.

Vegetation management is, therefore, necessary to reduce hazardous fuels, to ensure a safe and reliable supply of electricity and to maintain the utility rights-of-way and infrastructure in safe and reliable operating condition that complies to industry standards, regulations, and recommendations.

HEC's vegetation management program consists of an integrated approach that requires the combination of manual, mechanical and chemical methods. Manual and mechanical can be expensive and labor intensive and if not combined with chemical treatment, it might also be ineffective in the long term. Herbicide treatments offer an effective and economical solution to vegetation management in and around substations. HEC also targets power lines and structures with equipment or expulsion fuses for herbicide treatments. HEC worked with the BLM to study and list the approved herbicide treatment on all HEC rights-of-way in Oregon.

5.4 Fire Mitigation Construction

HEC follows the RUS Specifications and construction standards for all its utility pole framing practices. New powerlines are constructed in configurations that reduce the possibility of avian contacts and separate the phases therefore reducing the threat of a wildfire ignition source.

5.4.1 Avian Protection Program

HEC has been working to reduce Avian electrocutions and collisions on its system. In 2004, HEC began applying avian safe framing practices on all new construction and framing practices in accordance with APLIC's guidelines and their manual "Suggested Practices For Raptor Protection on Powerlines: The State of the Art in 1996".

Harney Electric has since developed and implemented an effective Avian Protection Plan to help meet its regulatory requirements, maintain good standing with regulatory agencies, reduce avian related outages, and manage avian interactions within HEC facilities.

HEC incorporated Avian Protection design in 2004 for all new power lines in all service areas. Every new pole or structure is built to Avian protection standards. Any existing pole that is changed out, the framing is updated to protect wildlife and reduce the chance of fire hazards.

5.5 Pilot Projects

During the last five years, HEC has introduced and installed a SCADA system that allows Engineering and Operations to monitor the system real time. This advantage was never possible in the past before SCADA was installed. The SCADA system is a very beneficial tool that will allow better knowledge and coordination of the system. The SCADA system also allows HEC to manually de-energize feeders from the main office should they decide to initiate a PSPS, or place reclosers in the non-reclose state during a red flag warning day if conditions call for such.

5.6 Workforce Training

HEC field staff will be:

- Trained on the content of the WMP
- Trained in proper use and storage of fire extinguishers
- Required, during pre-job briefings, to discuss the potential(s) for ignition, environmental conditions (current and forecasted weather that coincides with the duration of work for the day)
- Required to identify the closest fire extinguisher and other fire abatement tools
- Required to report all ignition events to management for follow-up
- Encouraged to identify deficiencies in the WMP and bring such information to management
- Some Employees trained in S130-190, Basic Wildland Firefighter training
- Trained on operation of HEC fire trucks and equipment annually

6 Emergency Response

6.1 Preparedness and Response Planning

In efforts to minimize the impacts of any disruptive event regardless of size or scope, HEC conducts an Emergency Response Plan exercise annually. Disasters or incidents that could affect the operational integrity of Cooperative are simulated and reviewed. The ERP manual is available in each office location for review and help should an occasion arise where it is needed.

6.1.1 Crisis Communications Team

In the event of an emergency, HEC has key staff members that are in contact with the local emergency departments. The General Manager, Operations Manager, and Line Superintendent have been designated as the emergency contact points for the local emergency departments.

6.1.2 Jurisdictional Structure

The largest portion of HEC's service territory is located on BLM managed land. HEC also has facilities in the land managed by US Forest Service, Dept of Fish and Wildlife, State land, and local Tribal land.

An example map showing the land ownership in the service area is shown on the next page.


[REDACTED]

6.1.3 Department of Emergency Services Communication and Coordination

In response to active emergencies, HEC coordinates and collaborates with the local Department of Emergency Management and relevant state and government agencies as a peer partner. During such emergencies, HEC provides a utility representative contact to the county and/or city DEM to ensure effective communication and coordination.

HEC's primary coordination point is Harney County Department of Emergency Management, which in Harney County is administered by the County Emergency Manager. The General Manager acts as the communications officer during an emergency.

6.1.4 Public Agency and Customer Communications for Outages

Work done during planned outages is to improve/update infrastructure and increase system reliability or make needed repairs. Customers affected by planned outages will receive notification via text, email, and/or voice messages approximately 24 hours prior to the planned outage. Office staff will also post outage information on HEC website and social media platforms.

6.2 Coordination with Stakeholders

HEC is a member of multiple Rangeland Fire Protection Associations. HEC holds and participates in multiple firefighting and power line safety trainings annually with the local RFPA groups and the Bureau of Land Management firefighters within the districts in HEC's service territory. Annually, HEC has a meeting with the Burns District BLM and has hand-held radios programmed to the correct frequencies for the year.

6.2.1 Community Outreach

HEC provides information on their website regarding powerline safety and emergency preparedness. HEC sends out a monthly magazine to all the members of the cooperative that include articles about emergency preparedness. HEC also attends local fire season preparation meetings with the local emergency departments in efforts to improve public awareness regarding wildfire safety around power lines.

6.2.2 Work Crew Communications

HEC's ability to maintain reliable communication with its line crews throughout the service territory is dependent on the local cell phone coverage area and HEC's radio system that utilizes multiple mountain top repeaters. In certain area, dead zones still exist, and alternate methods of communication are needed. HEC crews each have a satellite phone to be able to use when no other type of communication is available.

6.3 Restoration of Service

After any outage related emergency has occurred, HEC will put in place steps to make sure the area is safe to the public. HEC line crews will be dispatched to repair the emergency and restore power back to the affected consumers. Depending on the time of year, fire hazard potential, and if a red flag warning exists, lines may need to be thoroughly inspected and patrolled out before energizing, making outage time considerably longer in duration.

7 Performance and Monitoring

7.1 Plan Accountability

Staff responsibility for plan implementation and general communications is described below:

- The Board of Directors makes policy decisions relative to the Cooperative - they will be responsible for approving and adopting the Wildfire Mitigation Plan.
- The General Manager directs management staff responsible for operations, customer service and finance.
- The Operations Manager supervises the Line Superintendent
- The Line Superintendent supervises the Line crews.
- The General Manager is responsible for the overall execution of the WMP. Staff will be directed as to their roles and responsibilities in support of the plan.
- The General Manager and Operations Manager are responsible for communicating with public safety, media outlets, public agencies, first responders, local Office of Emergency Management, and health agencies during an emergency or planned maintenance outages.
- The General Manager determines when and how to notify outside agencies in cases of wildfire emergency events.
- HEC's General Manager and Operations Manager will be responsible for monitoring and auditing the targets specified in the WMP to confirm that the objectives of the WMP are met, as well as the implementation of the plan in general.

7.1.1 Identifying Deficiencies in the WMP

The General Manager will be responsible for ensuring that this WMP meets all public agency guidelines to mitigate the risk of HEC's assets becoming the source or contributing factor of a wildfire. Staff responsible for assigned mitigation areas have the role of vetting current procedures and recommending changes or enhancements to build upon the strategies in the WMP. Either due to unforeseen circumstances, regulatory changes, emerging technologies or

other rationales, deficiencies within the WMP will be sought out and reported to the Board of Directors in the form of an updated WMP on an as needed basis.

The General Manager or their designee will be responsible for spearheading discussions on addressing any plan deficiencies and collaborating on solutions when updating the WMP. At any point in time when deficiencies are identified, the Supervisors or their delegates are responsible for making the appropriate policy adjustments. HEC staff and qualified stakeholders are encouraged to bring any potential deficiencies to the attention of the Operations Manager. The General Manager, along with the appropriate staff, will evaluate each reported deficiency, and if determined to be valid, shall record the deficiency for further action.

7.2 Monitoring and Auditing the WMP

The WMP will be included as a discussion item in regularly scheduled management meetings. HEC will monitor the WMP and report on its effectiveness to the Board of Directors on an annual basis. The General Manager monitors the WMP's implementation and audits the specified objectives. The Operations Manager, or their designee, updates leadership with recommendations or proposed actions to enhance the Plan's objectives and strategies over time.

7.3 Plan Approval Process

7.3.1 Board Presentation

HEC's Wildfire Mitigation Plan will be submitted to the Board of Directors for approval during a regularly scheduled board meeting. Within 30 days after approval by the board, the WMP will be submitted to OPUC for documentation purposes.

Appendix A: Plan and Mapping Disclaimers

WILDFIRE MITIGATION PLAN DISCLAIMER

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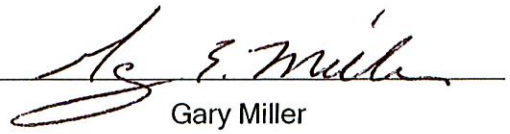
ATTESTED 

Gary Miller

Secretary