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January 28, 2025

The Honorable Chair and Members of the
Hawaii Public Utilities Commission
465 South King Street
Kekuanaoa Building, Room 103
Honolulu, Hawaii 96813

RE: Non-Docketed Case No. 2023-04661 – In the Matter of Public Utilities Commission Directing Public Utilities to Develop Reports Related to their Ongoing Efforts and Future Mitigation Plans to Address Natural Hazards – Kauai Island Utility Cooperative's 2025 Wildfire Mitigation Plan

Dear Commissioners and Commission Staff:

This letter is being filed on behalf of Kauai Island Utility Cooperative ("KIUC") for the purpose of submitting KIUC's 2025 annual Wildfire Mitigation Plan ("WMP"), pursuant to Ordering Paragraph 1 (Section III.1) of Order No. 41075, issued on October 1, 2024 in Case No. 2023-04661 (Non-Docketed) ("Order No. 41075").[1] [2]

By way of background, on August 21, 2024, KIUC filed its Utility Natural Hazard Mitigation Report, as required by the Commission's Order No. 40396 Directing Public Utilities to Develop and File Reports Related to Their Ongoing Efforts and Future Mitigation Plans to Address Natural Hazards.[3] As part of that report filing, KIUC

[1] Ordering Paragraph 1 (Section III.1) of Order No. 41075, at page 9, ordered KIUC to "[f]ile a Wildfire Mitigation Plan (WMP) comprised of KIUC's wildfire risk mitigation plan and related information in compliance with the requirements [in Order No. 41075], by no later than January 28, 2025".

[2] Ordering Paragraph 2 (Section III.2) of Order No. 41075, at page 9, also ordered KIUC to, "[p]ursuant to HAR § 16-601-111, file any proposed tariff revisions to the extent that the WMP impacts KIUC's tariffs no later than by January 28, 2025". KIUC is submitting its proposed tariff revisions through the filing of a separate tariff transmittal (Transmittal No. 2025-01).

[3] KIUC notes that in addition to providing background information on KIUC and its cooperative structure and cultural values, the Utility Natural Hazard Mitigation Report sets forth KIUC's main goals and objectives as they pertain to natural disaster-type events, and discusses among other things KIUC's numerous past, ongoing, and planned resiliency and reliability efforts, programs and projects to continue to improve and enhance the reliability and resiliency of KIUC's electric system and its ability to protect its system and its electric service from natural disasters and emergencies. The Utility Natural Hazard Mitigation Report also discusses KIUC's communications and outreach efforts and various methods of

submitted as Exhibit 3 its initial WMP dated May 2024. In submitting its initial WMP, KIUC stated the following on page 7 of its Utility Natural Hazard Mitigation Report:

> [F]ollowing the August 2023 wildfires that devasted Lahaina and other parts of the State, KIUC engaged the services of a specialized consultant to help explore and implement possible fire mitigation measures. This resulted in the development of KIUC's Wildfire Mitigation Plan in May 2024, which has been prepared for KIUC internal planning purposes at this time and will be reviewed and further discussed with KIUC's Board of Directors. The current version of this plan is provided as **Exhibit 3** and can also be found on KIUC's website at https://kiuc.coop/sites/default/files/documents/KIUC%20WMP%20V0%20Final.pdf.
>
> As stated in the Wildfire Mitigation Plan [submitted as Exhibit 3 to the Utility Natural Hazard Mitigation Report] at Section 1.1, the purpose of the plan is to set forth strategies and activities to reduce risk for KIUC's members/customers in the near-term, and that will allow for refinement and improvement over time. The plan will be amended from time to time as appropriate to allow for such refinement and improvement to align with any subsequent legislative mandates and as KIUC gains further experience in implementing the mitigation programs set forth in the plan and as new information and technologies emerge. As stated in Section 1.2, the objectives of the plan are to (1) create increased reliability and safety; (2) prevent, mitigate, respond/assist, and recover from wildfires; (3) comply with law and government regulations and guidelines; and (4) reduce liability.

In preparing the May 2024 WMP (referred to by the Commission in Order No. 41075 as the "Initial WMP"), KIUC noted that it already prepares and annually submits to the Commission its confidential Emergency Preparedness and Recovery Plan ("EPRP"),[4] which is designed to be used by KIUC in any disaster or emergency

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communication used to keep its members/customers, the public and other stakeholders informed through various stages of a potential and actual natural disaster event.

[4] As noted in footnote 1 of KIUC's Utility Natural Hazard Mitigation Report, the EPRP contains information considered by KIUC as extremely confidential, including information related to the security of KIUC's facilities and operations that, if disclosed publicly, could result in increased risks to KIUC's facilities, create serious security issues, and jeopardize the effectiveness of the ability to successfully carry out the plan. Among other risks, disclosure of the information could adversely impact KIUC's ability to respond to potential terrorist threats, making its customers and system operations vulnerable to sabotage or terrorism. In addition, the EPRP contains information on security readiness and recovery plans traditionally kept confidential in order to protect the integrity and security of system operations and to minimize the potential for interference with both normal operations and restoration/recovery efforts.

situation that may impact the electrical system and which also recognizes that major storms or emergencies can have varying levels of advance notice, some on very short notice and others with several days or more to prepare. As a result, the EPRP is the governing and main resource document used by KIUC in the event of any potential or actual emergency situation.

However, KIUC also recognized that especially in light of the August 2023 wildfires, there has been an increased focus on specifically wildfire risks. To address this, KIUC prepared the initial WMP to have a publicly available document available on its website that could be easily accessed, read and understood by KIUC's members/customers, agencies and other stakeholders that were interested in finding out information specifically on wildfire risks, as well as KIUC's strategies and plans to prevent and/or mitigate against wildfire risks and events. As discussed in the quoted language above, the WMP is intended to be an evolving document that will be amended to allow for refinement and improvement to align with any subsequent legislative mandates and as KIUC gains further experience in implementing the mitigation programs set forth in the plan and as new information and technologies change and emerge. KIUC intends to keep the most current version of the WMP on its website at all times.

In Order No. 41075, the Commission stated its appreciation of KIUC's submittal of its initial WMP[5] and then established a list of twenty (20) minimum requirements for this WMP, as well as for future WMPs that will be submitted to the Commission on an annual basis with the next updated WMP due by the end of this calendar year. These minimum requirements are set forth in Section II.A of Order No. 41075, at pages 5 to 8 (and included in the chart discussed below).

While KIUC notes that the majority of these minimum requirements were already covered in its initial WMP, KIUC has further revised and expanded upon its initial WMP including to more specifically address and incorporate these minimum requirements. In connection with this, KIUC submits the following chart, which lists each of the twenty (20) minimum requirements set forth in Section II.A of Order No. 41075, together with a cross-reference to the sections/chapters within the enclosed WMP that KIUC believes addresses or covers that specific requirement and subject matter.

Accordingly, maintaining the confidentiality of the information contained in the EPRP is necessary to prevent harm to KIUC, its employees, its members/customers and the public in general.

[5] Order No. 41075, at 4.

	D&O 41075 Minimum Requirements (Section II.A, pages 5 to 8)	WMP Reference
1	Identify each person responsible for executing the WMP and the scope of each person's responsibilities.	Section 8.1 Section 8.6
2	Describe the objectives of the WMP.	Section 1.2
3	Identify areas that are subject to a heightened risk of wildfire and are within the right of way or legal control or ownership of the electric utility.	Chapter 1 Chapter 2 Chapter 6
4	Identify a means for mitigating wildfire risk that reflects a reasonable balancing of mitigation costs, continuity of reliable service, and reduction of wildfire risk.	Section 1.1 Section 1.2 Chapters 2 to 8
5	Identify preventive actions and programs that the electric utility is carrying and shall carry out in the future to minimize the risk of electric utility facilities causing wildfires.	Chapters 3 to 7 Appendix A
6	Identify the metrics the electric utility intends to use to evaluate the WMP's performance and the assumptions that underlie the use of those metrics.	Section 8.7 Table 5
7	Describe how the application of previously identified metrics to evaluate previous WMP performance has informed the WMP.	Section 8.7
8	After seeking information from state and local entities, identify a protocol for the deenergizing of power lines and adjusting of power system operations to mitigate wildfires, promote the safety of the public and first responders, and preserve health and telecommunications infrastructure.	Chapter 7
9	Describe appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of power lines. The procedures shall consider the need to notify, as a priority, critical first responders, health care facilities, operators of wastewater and water delivery infrastructure, and operators of telecommunications infrastructure.	Sections 7.3 to 7.6 Section 7.11 Section 8.3 Section 8.4

	D&O 41075 Minimum Requirements (Section II.A, pages 5 to 8)	WMP Reference
10	Describe the procedures, standards, and time frames that the electric utility shall use to inspect electric utility infrastructure in areas that the electric utility identifies under paragraph (3), including whether those procedures, standards, and time frames are already set forth in the electric utility's existing plans or protocols and in coordination with any relevant entities.	Chapter 5 Section 8.9
11	Describe the procedures, standards, and time frames that the electric utility will use to carry out vegetation management in areas that the electric utility identifies under paragraph (3), including whether those procedures, standards, and time frames are already set forth in the electric utility's existing plans or protocols and in coordination with any relevant entities.	Chapter 6 Section 8.9
12	Include a list that identifies, describes, and prioritizes wildfire risks, and drivers for those risks, throughout the electric utility's service territory, including all relevant risk and risk mitigation information as may be required by guidance or rules adopted by the Commission.	Chapter 1 Chapter 2
13	Describe how the WMP accounts for risks the electric utility identifies under paragraph (12).	Chapters 3 to 8
14	Include a showing that the Company has an adequately sized and trained workforce to promptly restore service after a wildfire, taking into account employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered into contracts with the electric utility.	Section 7.8
15	Identify the estimated development, implementation, and administration costs for the WMP, including a breakdown by year and cost category.	Appendix A
16	Identify the timelines, as applicable, for development, implementation, and administration of any aspects of the WMP.	Chapter 4 Table 3 Chapter 5 Section 6.1 Chapter 7 Appendix A
17	Describe how the WMP is consistent with the electric utility's other hazard mitigation and emergency preparedness plans, including the following:	Section 8.3

	D&O 41075 Minimum Requirements (Section II.A, pages 5 to 8)	WMP Reference
(a)	Plans to prepare for and restore service after a wildfire, including but not limited to workforce mobilization and prepositioning equipment and employees.	Chapter 7 Section 8.3
(b)	Plans for community outreach and public awareness efforts that the electric utility will use before, during, and after a wildfire.	Section 7.3 to 7.6 Section 7.11 Section 8.3 Section 8.4
18	Identify specific measures to lessen the impact of reliability disruptions caused by wildfire mitigation, especially relating to low-to-moderate income customers, customers with special medical needs, kupuna, public safety partners, and critical facilities.	Section 7.3 to 7.6 Section 7.11 Section 8.3 Section 8.4
19	Describe the processes and procedures that the electric utility will use to perform all of the following:	-----
(a)	Monitor and audit the implementation of the WMP.	Sections 8.5 to 8.9
(b)	Monitor the progress and adherence to the WMP, including its implementation, and identify areas for improvement; and	Sections 8.5 to 8.9
(c)	Monitor and audit to ensure that inspections of the electrical line and equipment are conducted in compliance with the WMP and specifications/laws/regulations as well as assess the adequacy of such inspections.	Section 8.9
20	Demonstrate elements of data governance, including enterprise systems, as may be required by guidance or rules adopted by the Commission.	Section 8.2

If you should you have any questions, please do not hesitate to contact the undersigned. Thank you for your consideration.

Very truly yours,

/s/ Kent D. Morihara
KENT D. MORIHARA
PETER Y. KIKUTA

Schneider Tanaka Radovich Andrew & Tanaka, LLLC
Attorneys for Kauai Island Utility Cooperative

Enclosure

Kaua'i Island Utility Cooperative

Your Touchstone Energy® Cooperative

2025 WILDFIRE MITIGATION PLAN

JANUARY 2025

BKI ENGINEERING SERVICES

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Table of Contents

Table of Tables

Table of Figures

WILDFIRE MITIGATION PLAN DISCLAIMER

This is the first Wildfire Mitigation Plan (WMP) submitted by Kaua`i Island Utility Cooperative (KIUC) pursuant to the Hawaii Public Utilities Commission's Order No. 41075 issued on October 1, 2024. As required by Order No. 41075, an updated WMP will be filed annually by December 31st of each calendar year. As part of this annual update, the WMP will be amended as appropriate to reflect refinements, updates and improvements as KIUC gains further experience in implementing its mitigation programs and as new information and technologies change and emerge. These refinements, updates and improvements may occur at any time by KIUC as they are deemed prudent or required to carry out the objectives of the WMP. As a result, the information in this plan may not reflect current conditions and practices, KIUC makes no representations or guarantees, express or implied, regarding its accuracy, reliability or timeliness, and KIUC shall not be held liable for losses caused by using this information.

1 Introduction

The Hawaiian Islands are typically regarded as a tropical paradise due to the lush and green landscapes depicted on film and various media. Contrary to this image, the climate varies across and within each of the main Hawaiian Islands and is a composite of various kinds of weather patterns. The outstanding features of Hawaii's climate include relatively mild temperatures throughout the year, moderate humidity, relatively persistent northeasterly trade winds, significant differences in rainfall within short distances, and relatively infrequent severe storms. Hawaii's topography significantly influences every aspect of the weather and climate. The vast variety of mountains, peaks, valleys, ridges, and broad slopes, gives Hawaii a climate that is different from the surrounding ocean, as well as a climatic variety within the islands themselves. These climatic differences would not exist if the islands were flat and the same size. The mountains obstruct, deflect, and accelerate the flow of air. When warm, moist air rises over windward coasts and slopes, clouds and rainfall are much greater in that area than over the open sea. Leeward areas, where the air descends, tend to be sunny and dry. In places sheltered by terrain, local air movements are significantly different from winds in exposed localities. For most of Hawaii, there are generally only two seasons from a weather standpoint: (1) "summer," between May and October, and (2) "winter," between October and April.[1]

The frequency of wildfires on this remote archipelago located about 2,000 miles from the US mainland has experienced an increase of 400% over the last century.[2] This trend can be attributed to increased drought conditions combined with a long-term trend toward an increased cover of non-native grasses that smother and exclude other plants, and that grow and spread quickly during wet periods and rapidly dry out and become extreme fire hazards during dry seasons or periods of extended drought.[3] A warming, drying climate, as well as increased frequency and strengths of El Niño events have led to drought conditions that increase wildfire risks, especially in leeward areas. As further discussed in Section 1.4 (The Service Area), the south and southwest areas of the island of Kaua`i have landscape that appears to generally be more conducive to larger wildfire risks and are most frequently covered by Fire Weather Watch (FWW) and Red Flag Warnings (RFW) issued by the National Weather Service (NWS).

Historically, wildfires had been associated with volcanic activity or lightning strikes, but an overwhelming majority of wildfires in the state of Hawaii are caused by arson or human error, including fireworks, trash, cooking accidents, vehicles, and agriculture.[4]

Although specific Wildfire Mitigation Plan (WMP) mandates have not yet been enacted in Hawai`i, Kaua`i Island Utility Cooperative (KIUC or the "co-op") believes the development of

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1 https://www.weather.gov/hfo/climate_summary.

2 https://dlnr.hawaii.gov/hisc/info/species/invasive-grasses-in-hawaii-and-their-impacts/.

3 See id. It is estimated that over 25% of the Hawaiian Islands are now covered by non-native grasses.

4 https://dlnr.hawaii.gov/forestry/files/2013/09/SWARS-Issue-3.pdf.

this WMP is a prudent and responsible effort to prepare for increased wildfire conditions on Kaua`i. While an electric utility can never fully eliminate the risk of fire, KIUC is committed to taking all practical actions to reduce the risk and devastation that a wildfire could bring to the people and communities we serve. The WMP lays out the steps we are taking to do so.

1.1 Purpose of the Wildfire Mitigation Plan

The purpose of the WMP is to set forth strategies and activities to reduce risk for KIUC's members/customers in the near-term, and that will allow for further refinement and improvement over time. This WMP will be amended and updated from time to time as KIUC gains further experience in implementing mitigation programs to address known and potential risks, as new information and technologies change and emerge, and to align with any subsequent legislative or other mandates that may arise.

The WMP describes vegetation management, asset inspection and maintenance, recloser setting protocols, fire prevention strategies including protocols for Power Isolation (PI) events and Red Flag Warnings (RFWs), restoration of service processes, and community outreach efforts. It also addresses the unique features of KIUC's service area such as topography, weather, infrastructure, grid configuration, and potential wildfire risks. Additionally, it spells out plan ownership and responsibilities, performance metrics, deficiency identification and procedures to make refinements and improvements, and the plan's audit and approval process.

1.2 Objectives of the WMP

The WMP's main objective is to implement an actionable plan to:

- Create increased reliability and safety
- Prevent, mitigate, respond/assist, and recover from wildfires
- Comply with current law and government regulations and guidelines
- Reduce liability

To accomplish the above, KIUC's efforts focus on taking advantage of any pre-emergency time to prepare for, plan and set up systems and procedures to monitor and attempt to prevent and/or minimize any wildfire damage events, to recover electric service in the least reasonably possible time period in such an event, and for KIUC personnel to be dispatched to assist in assessment and emergency repair purposes as soon as it is safe to commit resources to do so.

In facing any disaster or a potential disaster, KIUC's highest priority before, during and after a natural disaster or emergency event is the **<u>safety of its employees, its members/customers and the public</u>**.

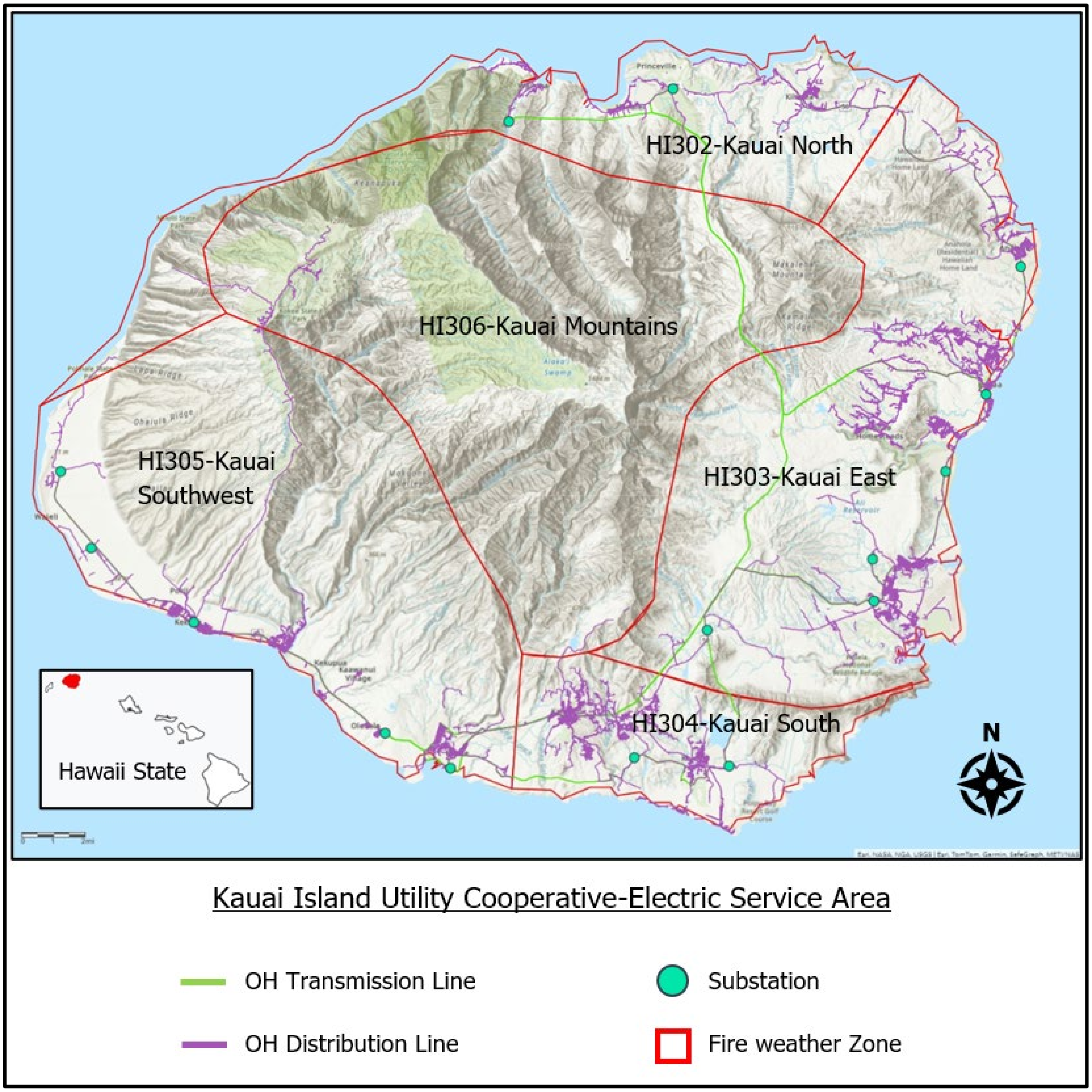
1.3 KIUC Profile and History

Serving the entire island of Kaua`i since 2002, KIUC is the only not-for-profit member-owned electric cooperative utility in the state, providing electricity to a population of over 73,000 through approximately 35,000 commercial and residential member/customer meters. The utility is governed by a nine-member Board of Directors, elected by the members served by the co-op. This member-elected Board determines policy and appoints the co-op's Chief Executive Officer (CEO) who is responsible for KIUC's overall management and operations.

1.4 The Service Area

KIUC serves a population of over 73,000 on the 562 square mile island of Kaua`i in the State of Hawai`i (see Figure 1 below). The volcanic origins of the island date back approximately 5 million years, making it the oldest of the main islands in the Hawaiian chain.

Figure 1. KIUC Service Area



The service area spans approximately 30 miles east to west and 25 miles north to south. With a tropical climate, the weather is generally moderately humid and warm with low altitude temperature ranging from 78°F to 85°F. July is the warmest month at 78° on average. Mountainous regions can be cooler with temperatures ranging from 45° to 65° at higher elevations of 3,200-4,200 feet above mean sea level (AMSL).

Precipitation at lower elevations averages about 50 inches on the windward side, to less than 20 inches on the leeward side of the island, with June typically the driest month. The mountains receive much more rain, with Mt. Wai`ale`ale often cited as one of the wettest places on earth. Between 1949 and 2004, the average yearly precipitation on this mountain was 374 inches at 5,074 feet AMSL.

The service area is also made up of agricultural lands interspersed with dense residential developments and towns at the lower elevations, with state parks, forest reserves, and wildlife refuges dominating the undeveloped areas at the upper elevations. Many of the open spaces are deforested and include untended agricultural lands taken over by non-native grasses.

There are dramatic variations in altitude, with the KIUC distribution system serving areas ranging from sea level up to about 3,500 feet AMSL. The highest elevation for the KIUC transmission lines is about 2,000 feet AMSL, with most of the transmission system at 50 feet to 500 feet AMSL.

Kaua`i is also full of microclimates due to its varying topography of interior valleys, coastal plains, and mountain peaks. The island is divided into five (5) Fire Weather Zones (FWZs). FWZs are land areas with similar climate, weather, and terrain characteristics. The National Weather Service (NWS) issues Fire Weather Watches (FWW) and Red Flag Warnings (RFW) for critical fire weather patterns that contribute to extreme fire danger risks and/or fire behavior. In Hawaii, an FWW is issued by the NWS when there is a high potential for the development of an RFW event. FWWs may be issued 12 to 72 hours prior to the expected onset of RFW criteria. The criteria for an RFW event is a Keetch-Byram Drought Index (KBDI) greater than or equal to 600, relative humidity less than or equal to 45 percent, and winds greater than or equal to 20 mph. RFWs alert of the potential for widespread ignitions or control problems with new or existing fires.[5]

Based on fire history, recurring fire weather conditions, vegetation profiles and climate, the south and southwest areas of the island (HI304 and HI305 in Figure 1 above) have landscape that appears to generally be more conducive to larger wildfire risks than the mountains, east, and north regions, and are the areas most frequently covered by FWWs and RFWs.

1.5 The Electric System

KIUC owns and operates generation, transmission, and distribution systems which are critical to providing and maintaining electric service to its members/customers. The co-op serves light industrial, urban, and suburban residences and businesses throughout Kaua`i Island with a peak load of about 80MW. The electric grid is a mix of overhead (OH – about 71%) and

5 See https://www.weather.gov/hfo/prod_questions.

underground (UG – about 29%) distribution with a nominal operating voltage of 12.47kV. Transmission is a mix of mostly wood poles and steel structures insulated to 69kV overhead (OH) with about 1 mile of underground (UG) construction. The nominal transmission voltage is 57.1kV.

Approximately 50% of the power for the electrical grid comes from renewable energy generation sources, such as biomass, hydroelectric, customer-owned rooftop solar (some with battery storage behind the meter), and large-scale solar facilities. The remaining power comes from KIUC's petroleum-fired generating plants. KIUC's Board-adopted strategic plan calls for generating 100% of its power from renewables by 2033. During periods of sunshine, all of KIUC's load can be supplied by clean renewable sources.

KIUC owns, operates, and has equipment in 14 substations and maintains approximately 1,311 circuit miles of OH transmission and distribution right-of-way (ROW). Table 1 below provides a high-level overview of KIUC's electric system assets.

Table 1. Asset Overview

ASSET CLASSIFICATION	ASSET DESCRIPTION
Transmission	Approximately 171 miles of 57.1kV OH and 1 mile of UG transmission line ROW, structures, and switches.
Distribution	Approximately 1,030 miles of primary OH and 330 miles of primary UG ROW, conductor, cabling, transformers, voltage regulators, capacitors, switches, line protective devices operating at 12.47kV.
Substation Assets	Major equipment such as power transformers, voltage regulators, capacitors, reactors, protective devices, relays, open-air structures, switchgear, and control houses in 14 substation facilities.

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2 Risk Analysis and Risk Drivers

To establish a baseline understanding of the wildfire risks and risk drivers involved, KIUC examined its exposure to all fire-related hazards. KIUC also examined its asset locations in relation to topographic features, wildfire history, and land ownership data to identify risks unique to its service area. This chapter will provide an overview of the co-op's service area properties and associated risks, which are factored into the wildfire mitigation strategy. See Section 1.4 (The Service Area) for a detailed description of the KIUC service area.

2.1 Fire Risk Drivers

KIUC evaluated its own, as well as other utilities', fire causes and applied its own field experience on the island of Kaua`i to determine the key potential risk drivers. The following ten categories were identified as contributors for heightened wildfire risks:

- Climate Change
- Fire Weather
- Drought
- Vegetation Encroachment/Non-Native Vegetation
- Tree Failure/Tree Mortality
- Wind Loading
- Corrosive Environment
- Aging Equipment
- Pole Degradation
- Joint Use/Pole Loading

Each of the above categories are further discussed in the subsections below.

2.1.1 Climate Change

The Fourth National Climate Assessment, published in 2018, states that sea level air temperatures in the northern tropical Pacific are expected to increase by 2.2°-2.7°F by mid-century and by 2.7°-5.9°F by the year 2100.[6] The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased. These changes may impact Kaua`i through rising sea levels, increasing ocean acidity, changing rainfall and drought patterns, changing wind and wave patterns, changing habitats and species distribution, and wildfire occurrence and intensity.

2.1.2 Fire Weather

As noted above, NWS issues Red Flag Warnings (RFW) for critical fire weather patterns that contribute to extreme fire danger risks and/or fire behavior. KIUC notes, however, that the issuance of an RFW does not necessarily and by itself result in concerns that KIUC infrastructure could fail and cause a wildfire. For example, one of the three criteria for an RFW

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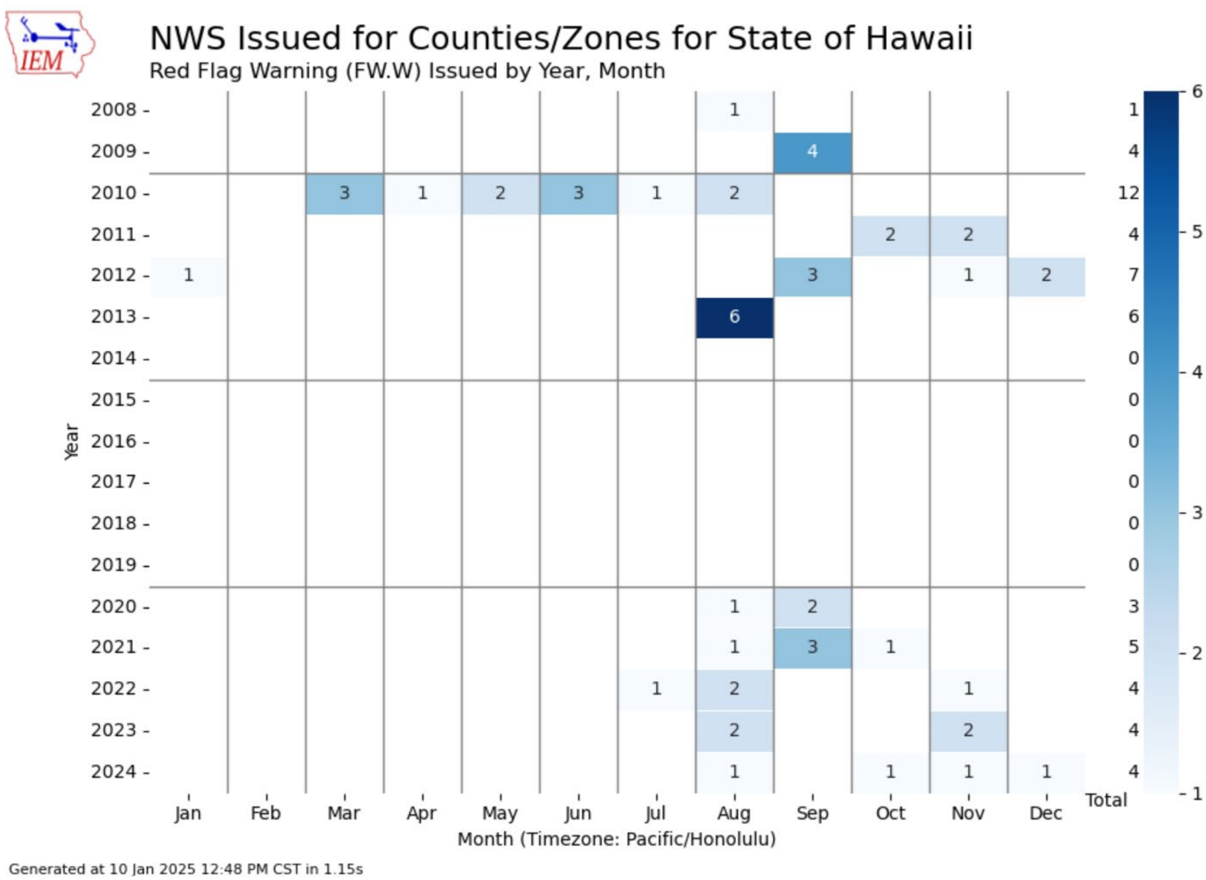
6 https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf.

in Hawai`i is winds greater than or equal to 20 mph[7], which is just above typical trade wind speed. Wind speeds of 20 mph and somewhat higher do not typically result in damage to KIUC's electrical infrastructure. KIUC also notes that tropical storm force winds are between 39-73 mph[8], and previous experience shows that wind speeds in that higher range are more likely to cause portions of KIUC infrastructure to fail. Further, the NWS Honolulu office has historically issued RFWs state-wide, across the entire island chain, and often times the criteria for an RFW (such as winds exceeding the 20-mph threshold) has not been met or exceeded on every island. All of these points result in KIUC needing access to more granular weather data so that it can more accurately and timely determine actions that may need to be taken to prevent its infrastructure from causing a wildfire. Figure 2 below depicts the historic occurrence of RFWs that were issued state-wide from 2008 through 2024.

Figure 2. Red Flag Warnings by Year/Month 2008-2024



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2008								1					1
2009									4				4
2010			3	1	2	3	1	2					12
2011										2	2		4
2012	1								3		1	2	7
2013								6					6
2014													0
2015													0
2016													0
2017													0
2018													0
2019													0
2020								1	2				3
2021								1	3	1			5
2022							1	2			1		4
2023								2			2		4
2024								1		1	1	1	4

7 https://www.weather.gov/hfo/prod_questions.

8 https://www.weather.gov/hfo/prod_questions.

2.1.3 Drought

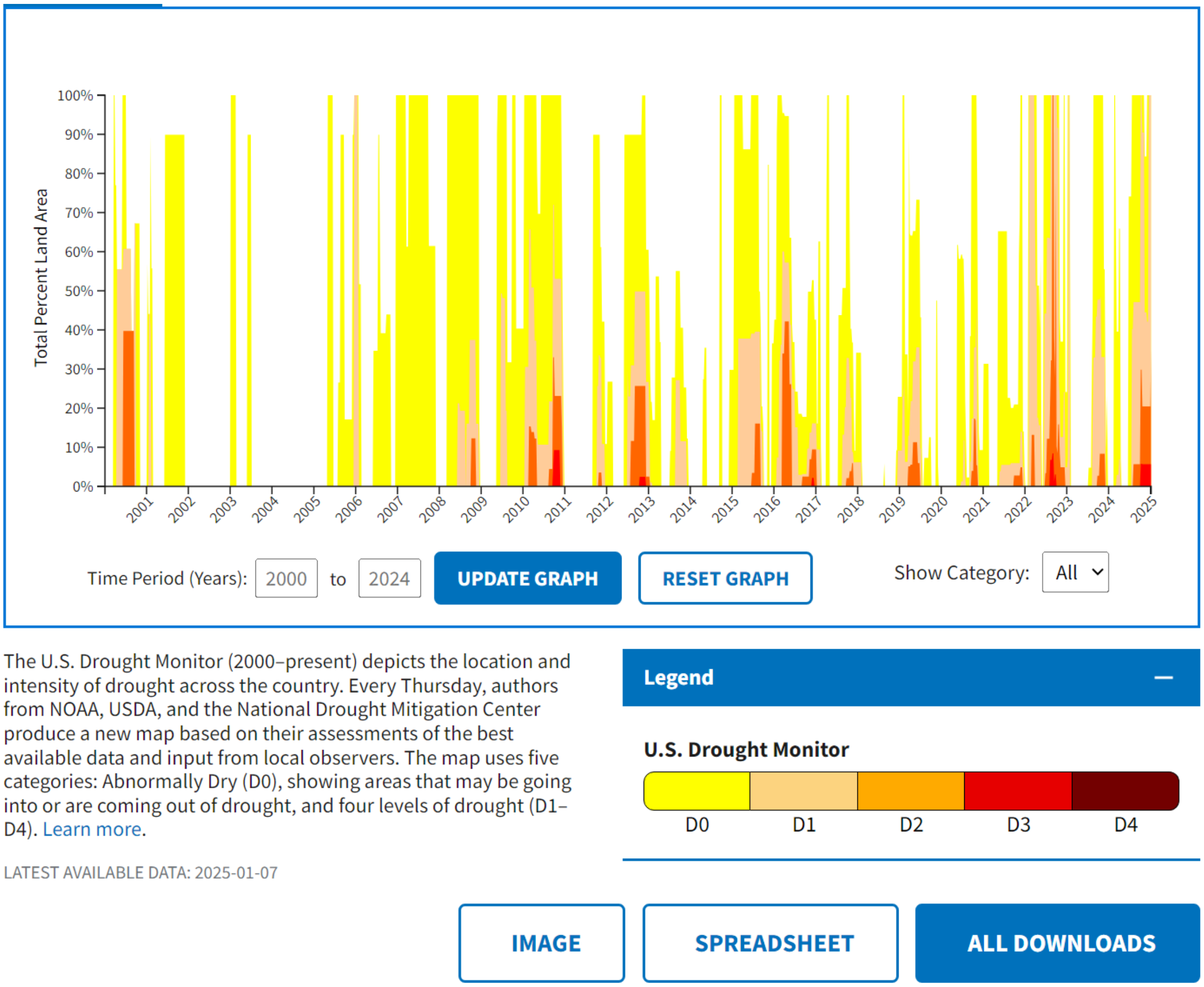
The U.S. Drought Monitor[9] depicts the location and intensity of drought conditions across the selected landscape. The system uses five categories: Abnormally Dry (D0), which are areas that may be going into or are coming out of drought, and four levels of drought, from D1 to D4 (moderate, severe, extreme and exceptional, respectively).

- D1 (moderate): Concerns about fire danger increase; pasture and crop growth is stunted; irrigation from reservoir water restricted; declining water levels; voluntary water restrictions; reservoir levels are depleted in high elevations.
- D2 (severe): Fire danger is high; pasture conditions are very dry/poor; cattle health is poor; coffee bean, sugar cane crops struggle; reservoir levels are low; springs are dried up; mandatory water restrictions.
- D3 (extreme): Fire spread rapidly; outdoor burn bans; water hauled for livestock; cattle culls; sugar cane production limited; trees dry and drop leaves; water production reduced.
- D4 (exceptional): Cattle die, cattle conception rates are reduced; hunting and hiking areas may be closed; specialty crops and orchard mortality; surface water severely impacted.

Records going back to the year 2000 show drought conditions for Kaua`i County have ranged from "None" to "D3-Extreme Drought" (see Figure 3 below). D4-Exceptional drought conditions were not found in the sample date range.

9 See https://www.drought.gov/states/hawaii/county/Kauai for current drought monitor conditions for Kauai County.

Figure 3. Historic Drought Conditions for Kauai County[10]



2.1.4 Vegetation Encroachment/Non-Native Vegetation

Vegetation encroachment is a constant challenge on Kaua`i, since there are no winter seasons where vegetation growth slows or ceases. Vegetation encroachment is continual and requires significant attention and investment to maintain. There are many challenging species that grow in and around KIUC's ROW (thus creating a potential wildfire risk to KIUC's poles and lines), including non-native vegetation as discussed in Section 1 (Introduction). Of these, Albizia trees present an especially challenging situation. Otherwise known as *Falcataria Moluccana*, Albizia have been in Hawai`i for over a century and are widespread on Kaua`i. Known as the fastest-growing tree in the world, the Albizia tree can spread rapidly and dominate its surroundings. A young Albizia can grow 20 feet in its first year and continue to grow 10 feet per year. With their fast growth rate and shallow roots, the Albizia trees are a major nuisance and cost to KIUC's vegetation management efforts and a fire hazard throughout the island, including to the co-op's transmission and distribution system. This species of tree does not fully develop,

10 https://www.drought.gov/states/hawaii/county/kauai.

which leads to weak and brittle wood, where as a result, seemingly healthy limbs can fail/fall without warning; a phenomenon known as "sudden limb sheer". Since they can grow to 200 feet in height, their branches pose a serious risk to power lines and power poles. All of the above aspects contribute to Albizia being very expensive and dangerous to remove.

2.1.5 Tree Failure/Tree Mortality

KIUC understands that electric utilities that investigate the actual causes of outages often find that the failure of branches and trees is a significant component of the tree-related outage category.[11] This is consistent with KIUC's own experience, where trees and tree limbs account for about 33% of the outages in Kaua`i. Since many portions of KIUC's distribution system are located in wooded or heavily treed areas, any tree, either live or dead, is considered a potential threat to the electric system if it is within striking distance of the power lines.

In 2023, the Coconut Rhinoceros beetle was discovered on Kaua`i. This invasive insect has reduced and decimated palm populations and damaged several other fruit trees on other Pacific Islands. Also, as of December 2018, both strains of *Ceratocyctis* fungi which cause rapid Ohia tree death have been confirmed to exist on the island of Kaua`i. These significantly exacerbate the risk of tree failures and mortalities.

2.1.6 Wind Loading

Trade winds generally create consistently moderate and overall pleasant weather throughout the year with 5-15 mph winds that blow from the northeast. Because the trade winds are so consistent, many trees grow in alignment with the general direction of the trade winds. As a result, when the wind direction shifts such as from the south and west (known as "Kona winds"), this can cause relatively more outages due to vegetation being blown against their normal growth pattern, which can more easily cause limbs to strain and break.

The hurricane season in the Pacific officially begins each year on June 1 and ends on November 30; however, tropical cyclones can and do occur year-round.[12] The last major hurricane to impact Kaua`i was Hurricane Iniki in September of 1992.[13] More common are tropical storms, which are slightly weaker than hurricanes but can still cause significant damage and safety risks.

2.1.7 Corrosive Environment/Aging Equipment

The inherently corrosive environment in Hawaii contributes to the advanced aging of equipment, which leads to equipment failure that can cause powerlines to fall to the ground and cause ignitions. Approximately 35% of the Kaua`i transmission and distribution system was destroyed during Hurricane Iniki in September 1992. Although some portions of the transmission system had been upgraded prior to Hurricane Iniki, the remainder of the

[11] https://www.tnelectric.org/wp-content/uploads/2016/08/ECI-Veg-Mgt-CRN.pdf.

[12] https://www.nhc.noaa.gov/aboutcphc.php.

[13] https://www.nhc.noaa.gov/data/tcr/CP1992_Seasonal_TCR.pdf.

system was constructed or rebuilt during the 1993-1995 time period following the hurricane. The steel transmission poles were designed to handle winds up to 125 mph.

Iron atoms in steel will readily oxidize in the presence of oxygen. If kept dry, and within humidity levels between around 30 to 50%, a thin surface layer of iron oxide, referred to as “stable rust”, will form and to a large degree protect the steel. Conversely, standing water and high, relative outdoor humidity accelerates corrosion, leading to a prevalence of hydrated iron oxide, also known as “cancerous rust”. This is caused by an increased exposure of atmospheric pollutants such as salt and man-made compounds that are distributed through pooling dew, condensation, and rainwater. Warm outdoor temperatures and higher relative humidity allow more water vapor to be present and increase the rate of corrosion. Kaua`i is generally a bit more humid than Maui and O`ahu due to its overall higher rainfall levels, with averages between 65% and 75% relative humidity. Salt spray from the ocean is the primary cause of the corrosion problem. While salt spray is found primarily along the immediate shoreline, the issue of accelerated corrosion is also found many miles inland and on the top floors of tall structures. The catalyst for the accelerated corrosion of steel in this circumstance is not airborne salt, but airborne chloride ions. In Florida, Hawai`i, and other coastal regions, these free ions are found anywhere from three to eleven miles from the shoreline, with areas like Cape Canaveral and Honolulu exhibiting some of the most extreme examples of this condition.

2.1.8 Pole Degradation/Joint Use and Pole Loading

The wet and humid conditions on Kaua`i are damaging to wood as well as steel. Wood poles can decay prematurely due to moisture intrusion. Coupled with this, many poles do not only carry KIUC’s electrical facilities, but also facilities owned and operated by telecommunications and cable providers, which increase the loading strain and stress on these poles. To combat this, KIUC has incorporated advanced pole testing technology that enables line workers to assess the condition of each pole quickly and accurately, and prioritize replacement based on this assessment and its remaining service life (see additional information in Section 5.4 regarding KIUC’s Pole Management Program). Composite poles, which are more immune to the damaging effects of a wet climate, are being used to replace wood poles in select areas. Composite poles also offer a number of environmental and other benefits over traditional creosote wood poles, including being non-toxic once installed and more durable, requiring less maintenance, and having a much longer lifespan of 50 years or more (compared to wood poles that typically have to be replaced every 20-30 years).

2.2 Key Risk Consequences

The aforementioned risks have many possible consequences should one or more of them become a contributing factor for a wildfire ignition. The list below outlines some of the worst-case scenarios, the prevention of which is the impetus for the development of the WMP:

- Personal injuries or fatalities to the public, employees, and contractors
- Damage to public and/or private property
- Damage and loss of KIUC-owned infrastructure and assets
- Impacts to service reliability and operations
- Damage claims and litigation costs, as well as fines from governing bodies
- Damage to KIUC's reputation and loss of public confidence in the co-op
- Negative public opinion of the power industry in general.

2.2.1 Wildfire History and Outlook

Hawai`i Wildfire Management Organization (HWMO) and the University of Hawai`i Cooperative Extension conducted a thorough compilation and analysis of statewide firefighting records, which revealed that wildfires are increasing in frequency, size, and severity on all islands.[14] It has been estimated that over 98% of wildfires are human caused; the remaining 2% are caused by lightning.[15] Whether ignited intentionally or by accident, HWMO determined that the origin point of most fires are along roads and human-access areas.[16]

The El Niño – Southern Oscillation cycle (ENSO) is a recurring irregular oscillation between warm and cool patterns which can have a strong influence on weather across the Pacific basin, and directly affects rainfall distribution in the tropics. Rainfall during a developing El Niño is especially heavy from August through October. By November, a rapid decline in rainfall begins, sinking to well below average by February of the following year. A composite of Total Acres Burned (TAB) during ENSO events reveals that a large TAB is likely to occur from spring to summer in the year following an ENSO event.[17] The level of these dry conditions depends on the intensity of the El Niño event, though widespread dryness across the Hawaiian Islands is typical.

Vegetation grows rapidly on Kaua`i's subtropical climate, but also dries rapidly during periods of dry weather or drought, creating a considerable buildup in extremely flammable materials. Fountain grass, false staghorn fern, and brooms edge provide fuel beds for high risk ignition and quick-fire spread. Invasive highly flammable grasses have also been a key factor fueling more intense wildfires. For several decades, the demise of plantation agriculture has contributed to increasingly frequent large wildfires on fallow farmland where grasses, Koa

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[14] See the following link: https://static1.squarespace.com/static/660b500392aae13704d0e302/t/6690553cafc73c2c2ab03577/1720735049526/2023+Reflections+Summary+Report_7.11.24_compressed.pdf.

[15] https://dod.hawaii.gov/hiema/files/2023/01/2023_Hawaii_SHMP_4.15_RA-Wildfire.pdf.

[16] https://dlnr.hawaii.gov/forestry/files/2018/04/2016_12_26_KauaiCWPPUpdate_HWMO.pdf.

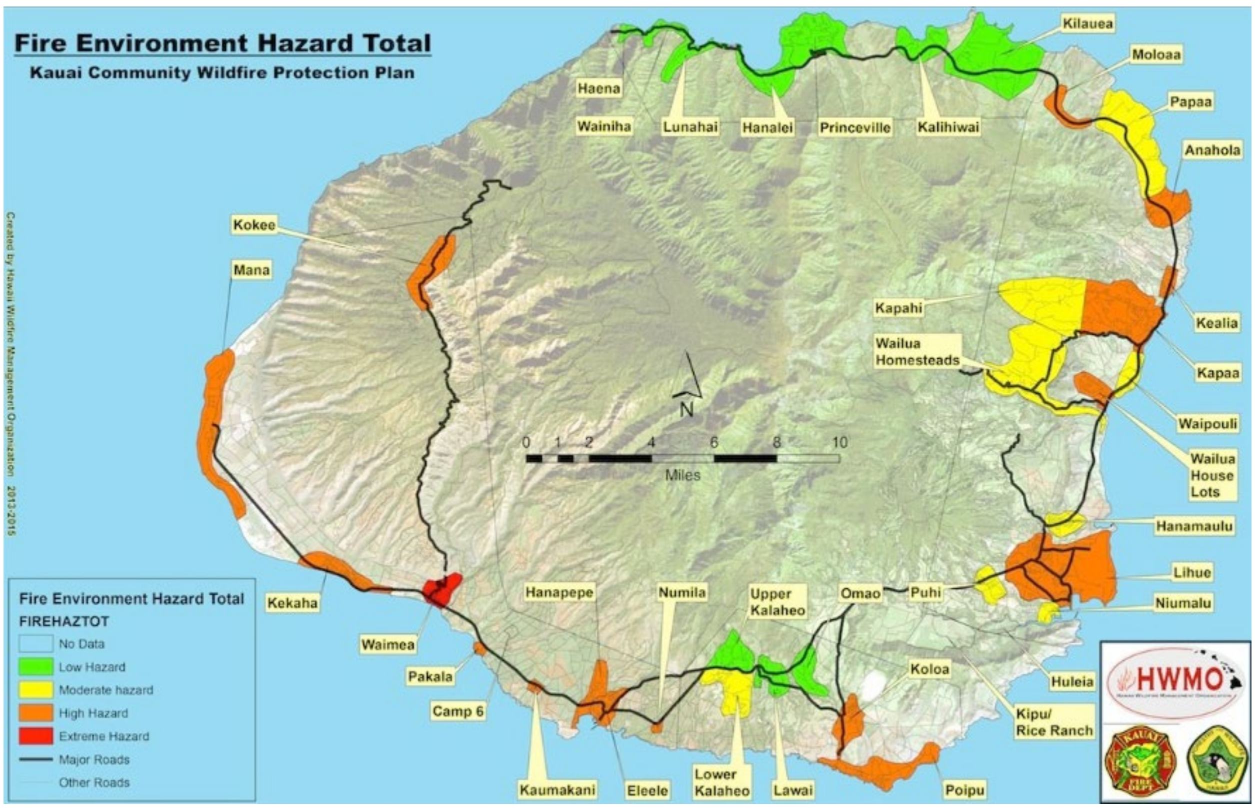
[17] Pau-Shin Chu, Weiping Yan and Francis Fujioka, International Journal of Wildland Fire, *Fire-climate relationships and long-lead seasonal wildfire prediction for Hawaii* (2002).

Haole, non-native vegetation and other easily ignitable and flammable vegetation has supplanted sugar cane, pineapple, and cattle ranching pastures.

2.2.2 Landscape Wildfire Risk Map

In June 2013, wildfire hazard data was collected, compiled, and mapped by HWMO with assistance and information from Kauai Fire Department (KFD) and Hawaii DLNR- Division of Forestry and Wildlife and funded by USFS Cooperative Forestry Assistance- Competitive Wildland/Urban Interface Grant Program.[18] This resulted in the Wildfire Hazard Assessment Map shown in Figure 4 below.

Figure 4. Kaua'i Community Wildfire Hazard Assessment Map



Kaua'i was assessed for 36 hazard components and rated by personnel from County Fire Departments, DLNR Division of Forestry and Wildlife Fire, and HWMO. Each community area on Kaua`i was assessed per hazard component. Only developed community, residential, and commercial areas were assessed for wildfire hazards. Because the focus of the assessment was to determine community areas at risk, uninhabited wildland or protected areas were not assessed for hazard risk under this format.

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18 See the following link: https://static1.squarespace.com/static/660b500392aae13704d0e302/t/66ecb42bcf13af1a715675ae/1726788661072/Community+Hazard+Assessments_County+of+Kauai.pdf.

KIUC notes that although the above map from 2013 shows areas around the island that are designated as being in a High Hazard area, the east side of the island rarely gets FWW or RFW conditions. Instead, the majority of these warnings are focused on the south and southwest portions of the island as noted in Section 1.4 (The Service Area), which has a landscape that generally appears to be more conducive to larger wildfire risks.

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3 Fire Prevention Strategies

KIUC's wildfire prevention strategies can be categorized into five main components set forth below. Together, the five components create a comprehensive wildfire preparedness and response plan with a principal focus on stringent construction standards, fire prevention through system design, proactive operations and maintenance programs, and specialized operating procedures and staff training.

- **Design & Construction:** KIUC's design and construction consist of system, equipment, infrastructure design and technical upgrades. These practices aim to improve system hardening to prevent contact between utility infrastructure and fuel sources to minimize the risk of KIUC's electric system becoming a source of ignition.
- **Inspection & Maintenance:** KIUC's inspection and maintenance strategies consist of diagnostic activities as well as various methods of maintaining and ensuring all utility equipment and infrastructure are in proper working condition.
- **Operational Practices:** Comprised of proactive day-to-day actions taken to mitigate wildfire risks and to ensure preparedness in high-risk situations, such as dry and windy climatological conditions.
- **Situational & Conditional Awareness:** This component consists of methods to improve system identification, visualization and awareness of environmental conditions. The practices in this category aim to provide tools to improve the other components of the WMP.
- **Response & Recovery:** This strategy consists of KIUC's procedures in response to wildfire, de-energization, and other emergency events. This component aims to formalize protocols for thorough and efficient communications, emergency response and recovery.

3.1 Preventative Strategies and Programs

The five components described above have several strategies and programs, most of which are already being implemented by the co-op. Some are situational, and are not limited to any timeframe, or are scheduled to be completed over several years, while others are in the evaluation or proposal stages. Table 2 below provides a summary of KIUC's programs and activities that support wildfire prevention and mitigation.

Table 2. Mitigation Programs/Activities

DESIGN AND CONSTRUCTION
UG distribution lines where feasible (Section 4.1)
Bare Wire Secondary Replacement Program (Section 4.2)
Circuit Recloser Upgrade (Section 4.3)
Supervisory Control and Data Acquisition (SCADA) – System Monitoring (Section 4.4)
Tree Wire in select areas (Section 4.5)
Non-Expulsion Fuses and Arresters (Section 4.6)
Pole Management Program - substandard pole replacement (Section 5.4)
Composite Poles in select areas (Section 2.1.8)
INSPECTION AND MAINTENANCE
Distribution Inspection and Maintenance Plan (Section 5.1)
Overhead Asset Inspection Program (Section 5.2, Table 3)
Transmission System Patrols including Aerial Inspections (Section 5.3, Table 3)
Pole Management Program including "Thor's Hammer" pole testing and diagnostics tool pilot program beginning 2024 (Section 5.4, Table 3)
Inspections including Infrared (IR) inspections of substation and line equipment (Sections 5.5, 5.8 and 5.9, Table 3)
Unmanned Aerial Vehicle (UAV) assisted inspections (Section 5.8)
Light Detection and Ranging (LiDAR) T&D inspection (Section 5.8)

Table 2. Mitigation Programs/Activities (continued)

OPERATIONAL PRACTICES
Wildfire protection recloser settings during RFWs (Section 7.2)
Hazard tree removal policy (Section 6.6)
SCADA on substation breakers and downline reclosers (Section 4.4)
Fire suppression equipment on line trucks
Vegetation management program, including vegetation cycle trim (Chapter 6)
Community outreach / tree assessment and planting guide /wildfire awareness information for members/customers (Sections 6.8 and 7.11)
Power Isolation (Section 7.4)
SITUATIONAL AWARENESS
Contractor/staff safety tailboard meetings prior to field work
KIUC Tempest weather station network (Section 7.1.1)
Line crew patrols (Sections 5.1, 5.3, 7.2, 7.3, 7.9 and 7.10)
Cameras and Other Technologies (Section 7.1.2)
RESPONSE AND RECOVERY
Outage response communication protocols (Sections 7.3 to 7.6, 7.9 to 7.11, and 8.3)
Line patrols prior to re-energization (Sections 7.2, 7.9 and 7.10)
Crisis Communication Plan (CCP) (Section 8.3)
Emergency Preparedness and Recovery Plan (EPRP) (Section 8.3)
Mutual Aid and Available Resources/Assistance (Section 7.8)

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4 Fire Mitigation Construction

4.1 Overhead vs Underground Conductor

The benefits of OH conductors are that they are much less costly and much easier to troubleshoot following an outage event, making restoration times shorter compared to UG construction.

The downside to OH conductor is its susceptibility to contact from foreign objects such as wildlife, vegetation, equipment and weather. These impacts can be minimized by using "tree-wire" which is explained later in this section.

The undergrounding of distribution lines improves reliability in high wind events and functions as an effective mitigation against wildfire. Most new residential subdivision developments are built using UG construction paid for by the developer. KIUC has approximately 330 miles of 12.47kV UG distribution line on its network. While there are many benefits to UG infrastructure, UG lines don't prevent all outages, and can have their own unique maintenance problems including greater difficulty and costs to identify and to access and repair/replace any problems. In rural areas, underground service may be unaffordable/cost prohibitive, as it requires longer stretches of line per customer and can cost significantly more to install than overhead conductors.[19]

4.2 Bare Wire Secondary Replacement Program

Bare-wire secondary conductor is an outdated construction standard no longer installed by KIUC. Because these facilities have no fused protection, un-insulated secondary lines are a potential source for ignition when they come into contact with vegetation.

KIUC has made proactive efforts to identify, locate and replace the bare wire secondary conductor remaining on its distribution system. When planning replacement projects, the priority is to upgrade circuits with higher customer density, with additional consideration given to areas with elevated wildfire risk.

All bare wire secondary on KIUC's system is targeted to be replaced by the end of 2025.

4.3 Circuit Recloser Upgrade

A recloser is an automatic, high-voltage electric overcurrent protective device. When a fault condition occurs, the recloser will generally close back multiple times to detect if the problem

[19] See https://www.power-grid.com/td/underground-vs-overhead-power-line-installation-cost-comparison/#gref and
https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/electric-reliability/undergrounding-program-description#Perspective.

still exists. If the problem was temporary, the recloser automatically resets and restores power.[20]

As part of its commitment to providing safe and reliable utility services to KIUC's membership, KIUC has replaced older oil circuit reclosers (OCRs) with three-phase solid dielectric vacuum units, three-phase magnetic actuated vacuum units, or SF6 Gas automatic vacuum units that provide better line protection and minimize fault energy, thus reducing the ignition potential to start a wildfire.

Electronic Vacuum reclosers provide fast, low energy interruption with long contact life, are oftentimes programable, and do not require the high maintenance demands associated with traditional recloser devices which contain oil and utilize electromechanical mechanisms.

4.4 System Monitoring - SCADA

KIUC has retrofitted all distribution and transmission breakers, as well as downline reclosers, with SCADA functionality to monitor circuit conditions, providing early notification and faster response to system abnormalities. Connecting electronic reclosers to the operations center via SCADA will also allow the operators to make recloser settings adjustments remotely, without having to dispatch personnel to the field, thus improving response time and safety. When wind speeds reach a certain threshold during a FWW or RFW, KIUC enables more sensitive relay protection schemes on affected circuits, as explained further in Section 7.2 (Red Flag Warning Protection Schemes), which results in faster de-energization and prevents reclosing.

4.5 Tree Wire

Tree wire, or covered overhead wire, consists of the conductor and an exterior covering (conductor shield, low-density inner layer, and protective outer layer). Tree wire allows closer spacing of the conductors, resists abrasion from foreign contact, and withstands temporary contact from tree branches and other ground points without creating a ground fault. It is also ultra-violet stable and is tracking and abrasion resistant. KIUC has installed a small amount of tree wire on down-fuse distribution lines in heavily treed areas for service reliability reasons. While there are safety benefits to tree wire, this material takes more time to construct, maintain, and repair compared to bare wire. Another challenge with the use of tree wire is the difficulty that protection equipment has in detecting line-down events. This can result in a covered downed line remaining energized more often and for longer periods than bare conductor, creating increased public safety and wildfire risk. Because tree wire benefits reliability for temporary vegetation contact but could pose a safety risk for fallen conductors as noted above, KIUC has so far focused on installing these in heavily treed areas that are at risk of frequent vegetation contact as noted above.

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[20] https://www.eaton.com/content/dam/eaton/products/medium-voltage-power-distribution-control-systems/reclosers/recloser-definition-information-td280027en.pdf.

4.6 Non-Expulsion Fuses and Arresters

The use of non-expulsion fuses and arresters plays a critical role in minimizing the risk of sparking fires during fault and overvoltage conditions. Unlike traditional expulsion fuses, non-expulsion fuses and arresters are designed to safely isolate faults without expelling hot gases or metal, thereby reducing the likelihood of igniting surrounding vegetation or other combustible materials. These non-expulsion fuses and arresters are contained within sealed, insulated housings that prevent the release of arc products into the environment, which is particularly important in fire-prone areas. By incorporating non-expulsion fuses and arresters into KIUC's distribution network, this enhances system safety, improves reliability during fault events, and furthers the ability to protect KIUC's infrastructure and the surrounding community. KIUC is currently conducting a study to identify non-expulsion fuses that can be used to replace existing expulsion fuses. The result of this study is scheduled to be completed in 2025 and will allow KIUC to begin procurement of non-expulsion fuses to be installed with a priority of replacement in higher fire risk areas first. Although non-expulsion fuses will provide the benefits as noted above, KIUC's Standard Operating Procedure (SOP) is to send SCADA commands to substation circuit breakers to disable automatic reclosing and command the circuit breaker relay to be set more sensitive than normal operating times when conditions dictate. When circuit breaker relay protection is set at a more sensitive setting, the circuit breaker at the substation will be commanded to trip for faults downstream of the circuit breaker, including faults downstream of expulsion and/or non-expulsion fuses. By operating in this manner, KIUC can limit the incident energy that could develop downstream due to foreign material contact or line down situation, thereby minimizing the risk that a fire could be ignited.

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5 Infrastructure Inspections and Maintenance

One of KIUC's primary missions is safely providing reliable power that is fairly and competitively priced. This requires continual maintenance and improvement of our electrical system, which includes vegetation maintenance and control within utility corridors and ROWs. Managing these areas necessitates balancing stewardship with sustainability while working in accordance with all applicable local, state, and federal laws.

Recognizing the inherent hazards of equipment that operate high voltage lines, KIUC maintains a time-based maintenance program for distribution, transmission, and substation equipment which plays an essential role in wildfire reduction. The following sections outline the inspection practices for the co-op, and Table 3 below provides a high-level overview of the inspection schedule for all assets.

Table 3. Inspection Program Summary

ASSET CLASSIFICATION	INSPECTION TYPE	FREQUENCY
57.1kV Overhead Transmission Lines	Aerial Inspection	1 to 2 times a year
	Wood Pole Testing/Detailed Inspection	Every 8-10 years per pole
12.47kV Overhead Distribution Lines	Wood Pole Testing/Detailed Inspection	Every 8-10 years per pole
Substations	Routine Inspection	Monthly

5.1 Distribution Inspection and Maintenance Plan

KIUC's Inspection and Maintenance Plan is based on sound industry principles and practices and is designed to provide safe and reliable service. The purpose of the Inspection and Maintenance Plan is to (1) provide procedures, instructions, and guidance to the field inspectors and line workers who perform inspections and patrols of KIUC assets, and (2) outline criteria to prioritize inspection findings and schedules to complete repairs and replacements based on the deficiency and its potential impact on safety and reliability, considering various factors.

The inspector will document the condition of the overhead systems recording any defects, deterioration, potential violations, safety concerns, or any other conditions that require attention. The focus of the inspection is on any hazards that would affect the integrity of the KIUC system or the safety of line workers and the general public.

Maintenance work is based on a three-tier rating system to prioritize and resolve safety and reliability issues. Inspection tags will be prioritized and issued, as discussed below and as shown in Figure 5 below:

- **Priority # 1** – Immediate hazard:

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

- **Priority # 2, 2.1, 2.2** – Non-emergency repair condition:

Conditions that require maintenance which can be scheduled to maintain the integrity of the system. Priority #2 tags will be prioritized by urgency and will be scheduled to have appropriate repairs made to correct the condition within two years where practicable. If the Priority Level 2 issue is located in a High-Risk zone and poses a potential fire risk, correction of the deficiency will occur within 3 months.

- **Priority # 3** – Minor repair condition:

Conditions that do not require near-term remediation as they do not pose a material safety, reliability, or fire risk. Priority #3 tags will be submitted by the inspector with the time interval recommended. In the judgment of the Transmission & Distribution (T&D) Department, work will be scheduled to be completed within five years.

Figure 5. Deficiency Risk Assessment Matrix[21]

Reliability Impacts ↑					
	Component Failure Could lead to system failure	**Priority 2.2** Action required 13-24 months	**Priority 2.1** Action required 4-12 months	**Priority 2** Wildfire Risk 0-3 months	**Priority 1** Immediate Action Required
	Component Failure Low risk to system	**Priority 3** Action required within 60 months	**Priority 2.2** Action required 13-24 months	**Priority 2.1** Action required 4-12 months	**Priority 2** Wildfire Risk 0-3 months
	Potential Component Failure	**Priority 3** Action required within 60 months	**Priority 3** Action required within 60 months	**Priority 2.2** Action required 13-24 months	**Priority 2.1** Action required 4-12 months
		No Impact	**Minor Impact**	**Moderate Impact**	**High Impact**
Safety Impacts →					

5.2 Overhead Asset Inspection Program

Under this program, KIUC personnel and contractors are to report hazards found during daily field work as part of the OH inspection program, which is performed in concert with the vegetation line clearance operations. During the course of routine line clearance operations, all spans of OH primary conductor will be inspected regardless of the presence of vegetation. While on each job site, contractors should also inspect secondary and service conductors.

Tree crew personnel are to report identified safety hazards on KIUC's distribution and transmission overhead facilities that could pose a threat to the general public as well as the co-op's employees and contracted workers. Hazards that present an imminent threat to personal or public safety are to be resolved immediately.

5.3 Transmission Line Routine Inspections

Line inspections consist of helicopter, vehicle, foot, and all-terrain vehicle patrols to examine KIUC transmission assets including poles, crossarms, conductors, and related equipment. Much

[21] The color codes in this figure are correlated to the Polehawk severity and Thor Pole Health Index (PHI) test results. Since immediate action is required for Priority 1 items to remedy the hazardous situation, no testing is warranted. In other words, time is of the essence to mitigate Priority 1 items. KIUC's goal is to meet the other color-coded timelines in this matrix once KIUC has had an opportunity to resolve the items from Polehawk and Thor. In doing so, KIUC notes that these programs are new to KIUC's processes and will require an increase/ramping up of KIUC's manpower and budgets, with the expectation that KIUC will be able to meet all these color-coded timelines by 2027.

of KIUC's system is in quite remote locations and difficult to access. Aerial inspections will occur once or twice per year to assess vegetation-to-conductor clearances and equipment corrosion issues.

Visual aids assist with evaluating and detecting potential damage to above-ground components during ground-based inspections. Inspectors look for visible signs of defects, structural damage, broken hardware, abnormally sagging lines, and wildlife contacts. Any anomalies found are addressed based on the severity of the defect. The ground-based transmission line inspections also provide an evaluation of ROWs and access roads. The inspection information accumulated informs planning and scheduling of future maintenance to avoid major faults and reduce fire ignition potential.

5.4 Pole Management Program

To maintain KIUC's 16,700+ utility poles, a formal Pole Management Program was initiated with the goal of inspecting approximately 12.5% of the poles per year. The pole inspections are performed by KIUC line workers on a planned basis to determine whether any poles have degraded or deteriorated below NESC design strength requirements with safety factors.

Beginning in 2024, KIUC increased inspector positions and incorporated the THOR Poletest™ advanced pole inspection technology into the Pole Management Program. KIUC inspectors can quickly assess timber pole condition in one minute using a special hammer connected to a geoscope with gyroscopic sensors and a sensor hub. The sensor hub is Bluetooth-enabled and quickly transmits data to the THOR Poletest™ app and interactive portal, which provide geospatial visualization and data insights on the pole's condition. This method is non-damaging to the pole, is faster, and more accurate than traditional sounding and intrusive testing used in the past.

Poles are also visually evaluated for the condition of cross arms, hardware, and attached equipment, as well as the condition and clearances of wire spans. This information is recorded in a pole condition database which tracks inspection and ongoing replacement work.

Pole replacements are prioritized based on the level of structural defect or deterioration, whether the pole is transmission or distribution, and if the pole contains equipment such as a transformer or recloser. Wood poles that pass inspection are re-tested with a target interval of 8 years (consistent with the 12.5% goal set forth above).

5.5 Substation Inspections

The maintenance plan provides for regular detailed inspections of all KIUC substations. Qualified personnel use prudent care while performing inspections, following all required safety rules to protect themselves, other workers, the general public and the reliability of the system. These inspections involve a thorough look at the substation facilities to confirm that there are no structural or mechanical deficiencies, hazards, or tree trimming requirements. Inspections include bi-annual transformer oil testing, infrared (IR) thermography, yard cleaning, DC system load testing, battery testing, and maintenance planning.

5.6 Circuit Recloser Inspection

The circuit reclosers are not inspected on a regular cycle but do receive inspection and testing when circuits are temporarily de-energized for unrelated reasons. During the inspection, a visual device inspection as well as a counter read verification is performed.

5.7 Geographic Information Systems (GIS) Mapping

An electric distribution utility uses a network of physical facilities to provide electric power and energy to its customers connected to those facilities throughout a geographical area. Each component of the distribution system, as well as each meter, has a physical location and associated data. To plan, construct, maintain, operate, and manage the electric distribution network, KIUC develops, maintains, manages, and utilizes this GIS data.

KIUC geolocates outage information from the NISC outage management system (OMS). Future fine tuning of the cause code assignments will help operations to identify tree related outages versus general equipment damage due to storms or corrosion. This would allow KIUC to create a "heat map" of vegetation issues to assist in prioritizing vegetation management (VM) work on the distribution system. It is a long-term goal to integrate this GIS technology into the VM program.

5.8 Unmanned Aerial Vehicle LiDAR/Infrared Inspections

KIUC has recently begun using Unmanned Aerial Vehicles (UAVs) to inspect company-owned solar facilities. The vehicles are fitted with high-resolution cameras as well as IR cameras to identify and record issues with the solar arrays.

Due to the cross-county alignment of many of KIUC's T&D lines, the co-op has integrated UAVs into the asset inspection program. The height and voltage levels of the equipment as well as conditions on the ground limit how close an inspector can approach the equipment without de-energizing the lines. Since UAV inspection does not require de-energization, bucket trucks, foot patrols or climbing structures, inspectors can utilize the UAVs to view and assess crossarms, pole tops, hardware, or any equipment not easily visible from the ground. Other potential uses include post storm inspection, trouble-shooting momentary outages and a general enhancement of the situational information gathering ability of the operations department. A visual record of ROW conditions can be created during the inspection process, which would enable KIUC to audit tree work and monitor changes in vegetation profiles.

In addition to in-house UAV inspections, KIUC will be performing UAV inspection using LiDAR technology of the entire T&D system to assess vegetation clearance distances from conductors and facilities.

5.9 Infrared (IR) Thermography

Hundreds of different pieces of equipment may be found in an electrical distribution system. They start with generation, high voltage transmission, switchyards and substations, and end with service transformers, switchgear, breakers, meters, and local distribution equipment.

Abnormal heating associated with high resistance or excessive current flow is the main cause of many problems in these electrical systems.

IR cameras create images from heat, rather than visible light. But thermal imagers don’t just make pictures from heat; they make pictures that show even minute differences in heat between objects. Because excess heat is a sign of increased resistance, IR technology is well suited to locating defects in connections and components that could not otherwise be easily identified. Thermal imagers provide critical information to avoid system failures and fires by enabling inspectors to see the heat signatures associated with high electrical resistance long before the circuit becomes hot enough to cause an outage or damage.

KIUC inspects its substation equipment monthly using IR technology. Distribution lines are inspected by outside contractors on an annual basis. Figure 6 below shows an example of IR inspection equipment in use.

Figure 6. Infrared Inspection

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6 Vegetation Management

Dense vegetation covers much of Kauai and can have a significant impact on service reliability. While trees are an important part of what makes Kaua`i a beautiful place to live, they can negatively impact the reliability of KIUC's system and can pose wildfire risks. Thus, Vegetation Management (VM) is a key component of reliability. To this end, KIUC has developed a formal VM program intended to maintain safe and reliable electric facilities, provide safety for the public and for utility workers, and mitigate fire risks throughout the service area. Historically, KIUC budgeted roughly $1.2 million a year for this work. In 2024, KIUC spent $2.1 million on its VM program. That figure is estimated to reach $3 million in 2025. When work is well planned and completed, the overall impact and risks of any undesirable vegetation or growth within the ROW is reduced, and the neighboring landowners, the motoring public, the wildlife that uses the ROW for nesting and foraging, and the overall public will benefit.

6.1 ROW Maintenance Program

Contracted VM crews are responsible for trimming trees and vegetation around the energized power lines, utility-owned fiber optic cables, utility poles, and regulators to obtain the minimum required clearance with due regard to current and future tree health and symmetry. Beginning in 2024, KIUC adopted a VM Plan which provides guidance for contract line clearance tree crews clearing and pruning trees year-round, aiming to re-clear the co-op's power line ROW on each circuit systematically on a five-year cycle.

KIUC maintains over 970 miles of OH ROW. This includes not only the maintenance of the hardware, conductors, and poles, but also trees and other vegetation that threaten to fall or grow into the powerlines. ROW maintenance is focused on providing recommended clearances between vegetation and conductors, and not on maintaining growth along the ground, below the powerlines, since grasses and bushes, and even short trees, are well outside of the required contact clearance area.

6.2 Vegetation to Conductor Clearance

Interfering tree limbs and falling trees or branches are a significant cause of power outages for KIUC. Since conductors move horizontally and vertically based on dynamics such as operating temperature, wind, and loading, clearance is evaluated from all possible conductor positions. Efforts are made to reduce trees, tree parts, and growth points, as well as any dead or dying trees, which may contact the wires.

KIUC has evaluated the vegetation characteristics and growth rates of the predominant species along the OH lines to determine the years of growth until they contact the conductor. Although the level and extent of pruning and/or branch removal will be specific to the species of tree, the general goal at the time of trimming is to achieve 10 feet of clearance from the conductor on distribution lines and 25 feet from transmission lines. In doing so, distribution lines are also cleared 15 feet above and 10 feet below the power lines.

6.3 Mechanical and Chemical Control Options

VM work may include chemical, manual, or mechanical techniques. The choice of control option(s) is/are based on effectiveness, environmental impact, site characteristics, worker and public safety concerns, and economics. KIUC uses the mechanical technique as the preferred method of maintenance when feasible, to avoid chemicals and to be more efficient.

6.4 Site Preservation

Care shall be taken to preserve the natural ground covers where feasible. Rivers, streams, beaches, natural drainage areas, ponds, etc. are not disturbed.

6.5 Trimming Standards

Trees are trimmed or removed for safety, reliability, and compliance with NESC[22] requirements. KIUC's contracted tree trimming crews are also governed by "Best Management Practices-Utility Pruning of Trees"[23] which is a companion publication to the (ANSI) A300 Part 1: Tree, Shrub, and Other Woody Plant Maintenance. This standard is intended as a guide for federal, state, municipal, and private authorities including property owners, property managers, and utilities. Contracted tree workers are expected to adhere to this standard when pruning trees near electric facilities. Correct tree trimming should promote tree growth away from electrical conductors, provide longer periods of clearance, and reduce future work. The level and extent of pruning and/or branch removal will be specific to the species of tree.

6.6 Hazard Trees

A subset of trees that are categorized as "danger trees"[24], a hazard tree is a tree that poses a greater likelihood of causing damage to electric power lines or equipment, where it is considered to be structurally unsound and positioned in a way that it could fall or come into contact with the overhead lines.

KIUC's practice is to remove these hazard trees. The selection of trees for removal is based upon the condition of the tree, the stability of the ground around the tree, tree species, and other defects that would cause the tree to be unstable and more likely to fall into or contact the lines. If a tree is healthy and stable, it is usually trimmed to remove the contact risk and not designated for removal, even if it is tall enough to strike the electric facilities if it should fall.

KIUC makes it a priority to remove hazard trees as soon as they are identified. Trees determined to be a potential threat shall be removed, leaving the stump as close to the ground as possible and treated to prevent re-sprouting. If removal is not feasible, the crown is reduced below the neutral wire and/or utility-owned fiber optic cable.

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[22] The National Electric Safety Code, Vegetation Management Section 2IS.A.I.

[23] The International Society of Arboriculture.

[24] As defined by American National Standards Institute (ANSI) 300 Part 7 standards. See Appendix B for definition of "danger tree".

6.7 Service Orders/Hot Spots

This involves the quick response to emergency situations. An example of this would be reports of arcing and sparking where trees are contacting the high voltage lines. Once reported, a service order would be generated and a tree trimming crew would be assigned to immediately address the issue once it is safe to do so.

6.8 Controlling Incompatible Vegetation

In addition to patrols by KIUC field staff observing and reporting on incompatible uses and encroachments, KIUC makes efforts to educate public and private landowners about incompatible vegetation that can pose risks if planted under or near conductors by providing tree planting guidance on KIUC's website (www.kiuc.coop) and through other communication channels such as social media and the co-op's quarterly magazine. KIUC believes that the member/customer plays an important part in our ability to address problems that may pose a threat to our power supply system. Customer outreach and input, combined with regularly scheduled ROW maintenance, helps to ensure that the co-op's power system is as reliable as possible.

6.9 Safety Standards

All personnel performing VM work on or near KIUC facilities or ROWs shall follow approved safety guidelines and procedures and comply with all applicable governmental safety and health laws, codes and regulations, and the safety and health provisions of their contracts.

KIUC follows two important standards for tree worker safety:

- OSHA 1910.269: Qualified electrical workers[25]
- ANSI Z133.1 (2006): Safety requirements

Contract line clearance tree workers must meet the requirements of these standards.

[25] https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.269.

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7 Operational Practices

This chapter outlines KIUC's existing fire mitigation efforts and identifies new and planned processes and programs KIUC will or may employ moving forward. Some of these programs are multi-year and programmatic, while others are situational and based on environmental conditions such as RFW. KIUC continues to explore new technologies and approaches to determine their ability to reduce the risk of ignition and improve system reliability. KIUC has initiated several new programs, such as IR inspections (see Sections 5.8 and 5.9) and a situational awareness tool (see Section 7.1 below). KIUC will continue to explore and undertake efforts to update and further refine its practices as new information and technologies emerge and improved or enhanced strategies and industry practices can be developed.

7.1 Daily Situational Awareness Tool (DSAT)

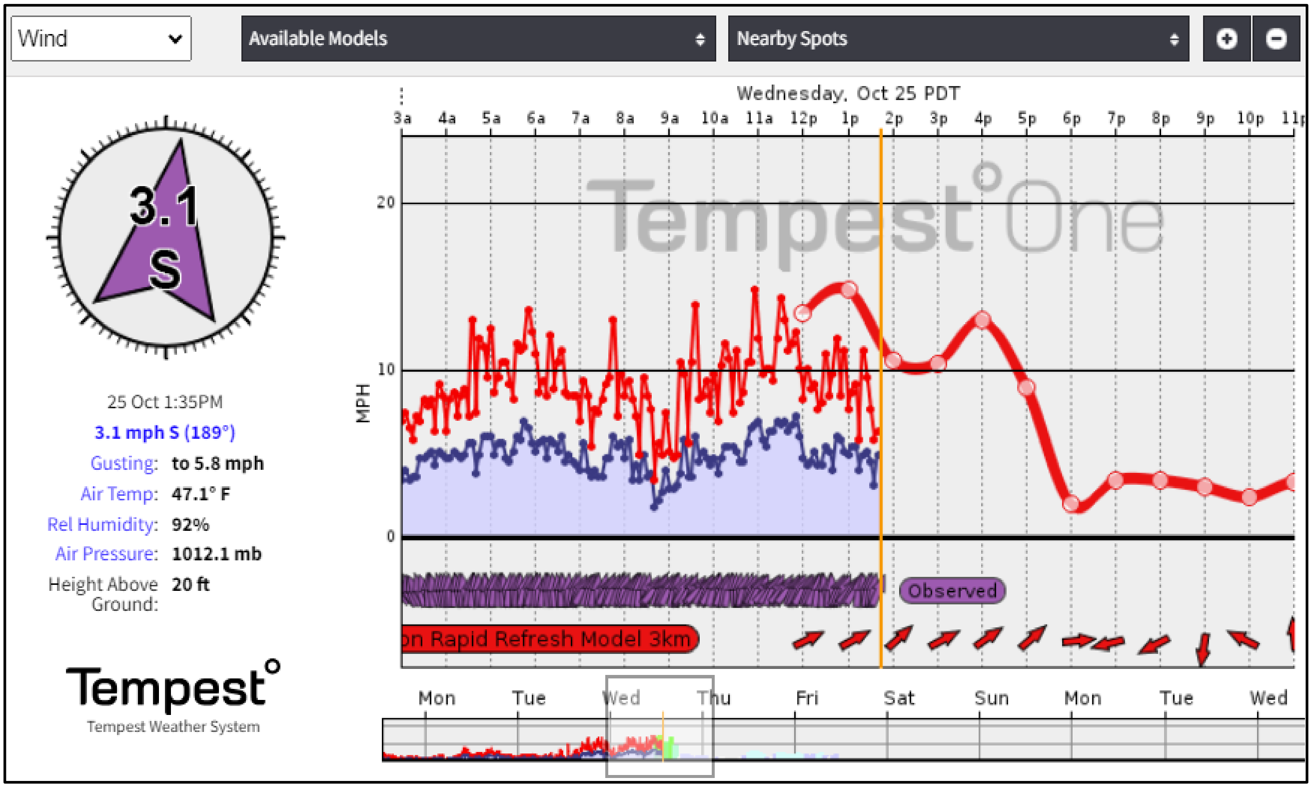
"Situational assessment" is the process by which current operating conditions are analyzed and determined. "Situational awareness" is the understanding of the working environment, which creates a foundation for successful decision-making and the ability to predict how it might change due to multiple factors.

KIUC uses all resources at its disposal to monitor evolving weather, fuel, and other climatological conditions that may lead to fire events. KIUC evaluates information such as real-time field observations, weather station data, ongoing wildfire reporting and other resources. Based on available information, KIUC appropriately schedules work crews, adjusts equipment settings, and prepares for fire conditions as needed.

7.1.1 Tempest Weather Stations

In 2024, KIUC purchased and installed Tempest weather stations at various locations throughout the service area where reliable weather data is currently unavailable. These stations are monitored remotely and provide temperature, wind data (average speed, gust, direction) barometric pressure, precipitation, lightning detection and relative humidity (see Figure 7 below). These stations are part of the DSAT program described above.

Figure 7. Tempest Weather Station Report



7.1.2 Cameras and Other Technologies

As part of our ongoing efforts to enhance wildfire mitigation, we are exploring the integration of camera systems paired with artificial intelligence (AI) to detect early signs of wildfire activity. These technologies have the potential to provide real-time monitoring and rapid response capabilities, improving our ability to identify fires before they escalate. However, we are still in the process of evaluating the effectiveness, reliability, and scalability of these systems in varied environmental conditions. Our evaluation includes assessing factors such as accuracy in detecting wildfires, false alarm rates, and the system's ability to operate in remote areas with limited connectivity. As we continue this assessment, we are committed to integrating the most promising and cost-effective technologies to bolster our wildfire prevention and response strategies.

In addition to AI-powered camera systems, we are also investigating a variety of other promising technologies to further strengthen our wildfire mitigation efforts. This includes the use of pole installed hardware equipped with sensors to identify permanent and momentary faults, which could be leading indicators of lines being an ignition source. These sensors can provide critical data to operations and further support decision-making in real time. Furthermore, we are exploring the potential use of satellite imaging and machine learning models to analyze large-scale environmental data for early wildfire detection and predictive mapping of fire prone zones. Additionally, fire-resistant materials are being evaluated to reduce the risk of fires spreading in regions.

As we continue this comprehensive assessment of emerging technologies, we are committed to integrating the most effective and scalable solutions to bolster our wildfire prevention and response strategies. Our goal is to build a multifaceted approach that combines cutting-edge technology with proven fire management practices to protect communities and ecosystems from the devastating impacts of wildfires.

7.2 Red Flag Warning Protection Schemes

A Red Flag Warning (RFW) is issued by the NWS when critical fire weather conditions are forecast or met.[26] These warnings call attention to weather conditions of importance that may result in extreme wildfire risk. The type of weather patterns that can cause an RFW include low relative humidity, strong winds, dry fuels, the possibility of dry lightning strikes, or any combination of the above. NWS may issue an RFW during an on-going event or if the fire-weather forecaster has a high degree of confidence that RFW criteria will occur within 24 or more hours.

KIUC has developed a standard operating procedure (SOP) for RFWs including pre- and post-fault line crew patrol protocols. KIUC will implement the procedures outlined in the SOP to determine settings for select protection equipment.

The purpose of this practice is to align circuit protection schemes with existing fire threat conditions. While these measures are intended to reduce the risk of ignition, re-energization patrolling times will increase significantly and may lead to prolonged customer outages.

7.3 Red Flag Warning Operational Protocols

When the KIUC System Operators receive notice that an RFW has been issued, the following guidelines are followed:

- Communication with Kaua`i Emergency Management Agency (KEMA) (the liaison to all County agencies including Kaua`i Fire Department (KFD)) to gather information on any specific area of concern.
- Communicate any operational changes to the State, County, and membership (external).
- Communicate any operational changes to KIUC employees (internal).
- Postpone T&D scheduled work and use line crews to patrol high risk areas.
- Consider helicopter flight to get real-time awareness of high-risk areas that may have large amounts of "fuel" (i.e., ignition sources) to cause a wildfire below or near overhead lines.
- Cancelling normally scheduled switching programs during the RFW period.

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[26] See Section 1.4 (The Service Area) and Section 2.1.2 (Fire Weather) for additional information regarding RFWs.

During an RFW, work in the affected area is performed only when the following conditions are met:

- Work is required for emergency repair or restoration,
- Crew has fire suppression equipment accessible in the immediate area of work that would facilitate an immediate response to an ignition,
- Local weather conditions, terrain, and surrounding vegetation would permit crews to extinguish a fire resulting from the work being performed, and
- Crews will be on alert for fires while working or passing through high-risk areas and report fires or signs of fire to the emergency services or operations center as soon as feasible.

7.4 Power Isolation

Power Isolation (PI) preemptively de-energizes power lines during high risk conditions, such as high wind events combined with hot and dry weather conditions. More specifically, in order to protect KIUC's system, its employees, its members/customers and the general public, KIUC may decide it is prudent and/or necessary to pre-emptively de-energize power lines in response to a condition determined by the co-op to be hazardous and/or in the interest of public safety.

When considering this type of operation, KIUC examines the impacts on fire response, water supply, public safety, and emergency communications. KIUC also considers the external risks and potential consequences of a PI while striving to meet its main priority of protecting the communities and members/customers we serve. They include, but are not limited to:

- Potential loss of water supply to fight wildfires due to loss of production wells and pumping facilities that rely on electricity.
- 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 efficiencies that occur 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, fire, police, and schools.
- 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.

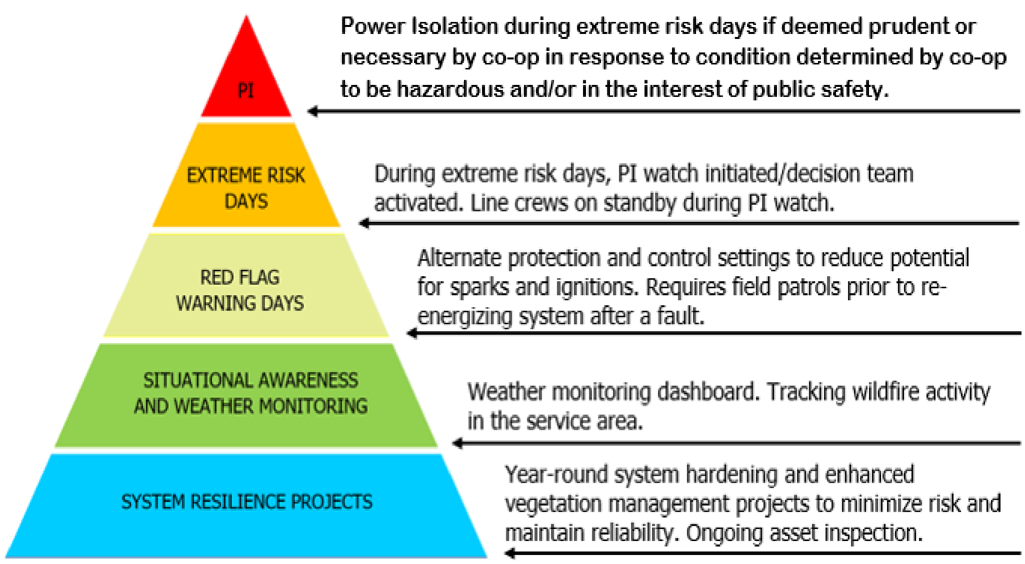
The risks and potential consequences of initiating a PI are significant and extremely complex. However, and as set forth in Section 1.2 (Objectives of the WMP), in facing any disaster or a potential disaster, KIUC's highest priority before, during and after a natural disaster or emergency event is the **safety of its employees, its members/customers and the public**. As a result, KIUC must reserve the option of implementing a PI when conditions dictate.

On a case-by-case basis, KIUC will also consider de-energizing a portion of its system in response to a request from an emergency management agency. Any isolation of the distribution system is performed in coordination with key local partner agencies, but the final determination is made by KIUC.

7.5 Wildfire Readiness Framework

KIUC's enterprise-wide approach to wildfire readiness is comprised of the conditional levels depicted in Figure 8 below. These readiness protocols are intended to strengthen/harden the overall system, create situational awareness within and outside the service area, implement conservative protection and control settings during critical fire weather conditions, deploy additional resources when needed, activate the PI Decision Team made up of KIUC department heads and senior leadership, and finally, if deemed prudent and/or necessary in response to a condition determined by the co-op to be hazardous and/or in the interest of public safety, preemptively de-energize portions of the system. In situations that could lead to a PI or other unplanned outage, KIUC will convene the PI Decision Team to work together to ensure that appropriate and actionable information reaches all concerned stakeholders.

Figure 8. Wildfire Readiness Framework



7.6 Power Isolation Notification Protocols

KIUC management understands that poor communication during an emergency can further contribute to injury, property damage, and even death. In an effort to mitigate and avoid this, KIUC has developed protocols to ensure that appropriate and actionable information reaches all concerned stakeholders in a timely manner.

Whenever feasible, KIUC will begin notifying its members/customers approximately 72 to 48 hours in advance of a potential PI event, and will as soon as practical issue additional alerts and updates as the situation develops. Announcements will be made once the power has been deenergized, throughout the outage, and when power has been restored. There may be situations that prevent KIUC from providing advance notice. For example, the actual or sudden onset of extreme weather or hazardous conditions and other circumstances beyond the co-op's control may impact coordination and notification efforts.

Information regarding the PI or other unplanned outages will be shared with stakeholders as soon as feasible to allow for the maximum amount of time to prepare and respond. During these times KIUC will utilize the following channels of communication:

- KEMA
- Communications companies attached to or collocated with KIUC infrastructure
- News media outlets serving the affected areas
- KIUC's mass email distribution list
- Instant, concurrent mass notification via email, phone and text via Everbridge subscription service
- KIUC's social media accounts (Facebook, Instagram)
- Prominent postings on KIUC's website (www.kiuc.coop)
- Talking points provided to KIUC member services representatives
- Direct calls to key accounts and identified special needs members
- KIUC's online "Outage Center".

7.7 Workforce Training

KIUC believes that an important line of defense against the ignition of wildfires is a well-trained and alert workforce. To that end, KIUC has fostered a culture of fire awareness and prevention by developing a set of work rules and complementary training designed to minimize the likelihood that KIUC's facilities or field work are the source of ignition for a fire.

Management has taken a proactive role in ensuring that all employees are aware of fire-threat weather conditions and requires that field workers immediately report and document the knowledge of any fires or fire risks within KIUC's service area; and document all known information related to any fire within the service area regardless of cause. KIUC's training program for employees incorporates regulatory changes, weather updates, situational awareness, and partnerships with cooperating agencies.

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 fire ignition, environmental conditions, and the closest fire extinguisher and other fire abatement tools,
- Required to report all ignition events to management for follow-up, and
- Encouraged to identify any deficiencies in the WMP and areas of improvement or refinement and bring such information to management.

7.8 Showing of Adequately Sized and Trained Workforce / Mutual Aid and Assistance

KIUC is adequately staffed to promptly restore service after a wildfire. As the sole generation, transmission, and distribution electric utility on the island, KIUC is available 24 hours-a-day/ 7-days-a-week to restore its electric services that could be impacted by wildfires.

Response to a wildfire could be initiated by an internal or external alert to dispatch operations, or via an automated outage notification via SCADA and/or KIUC's OMS. If dispatch operations are alerted of the outage via SCADA and/or OMS, dispatch operations will dispatch a troubleshooter to the location to verify the outage, and if a fire is within the vicinity, take necessary precautions to isolate energized lines in coordination with KIUC dispatch. KIUC staffs four (4) full-time, on-call troubleshooter positions across the island to respond to all outages. If the troubleshooters require additional support to respond to a wildfire, KIUC also staffs four (4) four-person line crews who are on-call to respond. Normally the line crews are split equally between west-south and east-north; however, KIUC has the ability to dispatch these crews around the island as needed.

All crews are trained to work on KIUC's T&D system, which provides flexibility for dispatching crews to potential dynamically evolving wildfire threats. Additionally, all crews attend annual safety compliance training events including OSHA HAZWOPER, pole rescues, CPR, and NFPA 70E training.

As an electric cooperative, KIUC is a member of the National Rural Electric Cooperative Association (NRECA). NRECA provides a network of support for electric cooperatives, including but not limited to providing education and training, and various management services. As part of this network, cooperatives throughout the nation have banded together and marshaled resources to aid devastated electric operations after floods, hurricanes and ice storms. For additional information regarding NRECA, see https://www.electric.coop/.[27] As a result, during times of a disaster, KIUC will be able to call upon the NRECA network of cooperatives to assist in recovery and restoration efforts.

KIUC also has Memorandum of Understandings (MOUs) with other outside entities, such as Hawaiian Electric Company (HECO) and Western Region Mutual Assistance Group (WRMAG). WRMAG is comprised of various utilities in the western US mainland. Although each MOU varies in language, the intent of the activation for support is similar in principle. To activate, participating entities would be contacted, a joint call set up, and KIUC would discuss their needs with the other entities. Responding utilities would then mobilize to Kaua`i to support the wildfire or natural disaster response. Fortunately, KIUC has not had to request mutual assistance since it acquired Kauai's electric utility in 2002.

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[27] A Mutual Aid Agreement has been established by NRECA that is recognized by FEMA. This agreement ensures that a qualifying electric cooperative is in the best position to receive maximum reimbursement for expenses incurred by aiding electric utilities that are also Mutual Aid Agreement signatories. The EPRP contains a copy of KIUC's signed Mutual Aid Agreement.

In addition to mutual assistance, KIUC has vendor agreements and contacts for on-island support when necessary. These vendors can provide vegetation, line inspection, earth moving, construction, and civil services. A copy of these vendor contacts is included in KIUC's EPRP, which is confidentially filed annually with the Hawaii Public Utilities Commission.

In terms of resource adequacy, on average, KIUC can replace one pole every four hours with a four-person crew. Using all of KIUC's line crew to replace poles as a result of a wildfire would yield an output of four poles in four hours. Using an average distance of 300 feet between poles would yield approximately 1000 feet of pole distance replaced in four hours. Depending on the size of the fire, damage to the surrounding area that may hinder replacement/restoration efforts, staff resources, and the available load to serve after the wildfire would dictate to what extent additional resources may be needed outside of KIUC's staff.

7.9 Restoration Priorities

The management of KIUC considers the restoration of electric service to be of primary importance to the safety, security, and livelihood of the community. We will employ our manpower and machinery resources in a manner to restore electric service in the last reasonably possible time, to minimize any potential damage, and for KIUC personnel and resources to be dispatched to assist in assessment and emergency repair and restoration purposes as soon as it is deemed safe to do so.

If KIUC receives a request from the county to provide emergency assistance to the community, we will assess the availability of our resources to accommodate such requests.

If an outside emergency management or emergency response agency requests a power shutdown, or if KIUC elects to de-energize segments of its system due to extreme weather or other factors, KIUC staff will patrol the affected portions of the system before the system can be re-energized. Suspect equipment or distribution lines that cannot immediately be patrolled (due to weather, time of day, geography, safety concerns, etc.) will remain de-energized. Poles and structures damaged in a wildfire must be assessed, repaired and rebuilt or replaced as needed prior to re-energization. Periodic customer and media updates providing a status of restoration and re-energization efforts will be made.

Public and employee safety is KIUC's highest priority.

After a large outage, efforts shall be directed to restore company facilities in the following order:

1. Power Plants and other generation facilities
2. Critical Transmission lines
3. Substations
4. Distribution-Primary
5. Distribution-Secondary and Services

All efforts will be directed toward restoring service to critical facilities and to the next largest block of customers. In doing so, KIUC generally prioritizes outages at the higher-voltage level, focusing on power substations serving large numbers of customer, schools, businesses, and hospitals first, then to restore the largest feeders. Smaller outages are then addressed, followed by outages affecting non-essential streetlights.

7.10 Service Restoration Process

KIUC work crews will take the following steps prior to restoring electrical service after a wildfire or de-energization event. These measures are intended to protect the workers, general public, and the reliability of the system.

- **Patrol:** De-energized lines are patrolled to ensure no hazards have affected the system during the outage. If an outage is due to wildfire or other natural disaster, as soon as it is deemed safe by fire officials, lines and equipment are inspected for obvious damage or foreign objects and to estimate equipment needed for repair and restoration. Lines located in remote and rugged terrain with limited access may require additional time for inspection. VM crews are called on to assist in clearing downed trees and limbs as needed.
- **Isolate:** Isolate the outage and restore power to areas not affected or damaged by the wildfire or natural disaster event.
- **Repair:** After the initial assessment, KIUC supervisors, managers, and engineers meet to plan the needed work. Re-building will commence as soon as affected areas become safe. Repair plans prioritize substations and transmission facilities, then distribution circuits that serve the most critical infrastructure needs. While the goal is to reenergize all areas as soon as possible, emergency services, medical facilities, and utilities are given first consideration when resources are limited. Additional crews and equipment will be dispatched as necessary.
- **Test:** After repairs are completed and the equipment is safe to operate, line segments are energized and tested.
- **Restore:** After successful line testing, power is restored to homes and businesses as quickly as possible. Customers, local news, and other agencies are notified of the restoration of electric service. Periodic customer and media updates of restoration status prior to full restoration will be made. After initial power restoration, further repairs and rebuilding may take place.

7.11 Community Outreach

KIUC encourages its members/customers to take proactive measures to safeguard their homes from wildfire danger and to prepare for emergency events through proactive messaging via social media, news releases, mass email and KIUC’s quarterly Currents magazine. To help create an awareness of fire danger in the service area, and what homeowners can do to minimize it, KIUC will maintain current information on prevention and mitigation on its website (www.kiuc.coop).

KIUC maintains a list of members/customers who have submitted a doctor's verification of special medical needs. This list is used for preemptive communications when an RFW or PI is possible. KIUC has developed an informational brochure for individuals dependent on power for medical devices/equipment to assist in planning for outages, and is working with the county, social service agencies and others to distribute them.

Members/customers will also be directed to links to the following safety information on the KIUC website:

- Line Safety
- Call before you dig
- Home electrical safety checklist
- Safety quiz
- Storm Sense
- Downed power line safety
- Defensible Space Guidelines for Homeowners
- Outage Information Map

KIUC's website also features an Outage Map that members/customers can use to stay updated on current outage information.

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8 Plan Implementation and Monitoring

This chapter identifies KIUC management responsibilities for plan implementation and oversight. In addition to a robust mitigation strategy, KIUC has developed performance metrics to help analyze and monitor the co-op's wildfire mitigation efforts over time. These metrics aim to provide a data-driven evaluation to determine the effectiveness of various programs and identify areas for possible refinement and improvement. This chapter also identifies the methods for identifying plan deficiencies and the quality control and audit process for the WMP.

8.1 Plan Accountability / Staff Roles and Responsibilities

The following outlines the various roles of KIUC staff.

- The **CEO** directs management staff responsible for operations, engineering, finance, and information technology.
- The **COO** determines when and how to notify outside agencies in cases of wildfire emergency events.
- The **COO** oversees the electric system's design.
- The **COO** is responsible for implementing the plan in general. Staff will be directed as to their specific roles and responsibilities.
- The **COO and senior staff** are responsible for monitoring and auditing the targets and performance metrics specified in the WMP.
- The **COO and Communications Manager** review all emergency-related communications before distribution.
- The **Communications Manager** responds to the news media and general membership.
- The **KEMA Liaison**, or designated staff, communicates with first responders, health agencies, communications providers, Offices of Emergency Management (OEM).
- The **T&D Manager** oversees contracted VM operations and inspections.
- The **Energy Services Supervisor** communicates with key accounts prior to planned outages.

8.2 Data Governance

KIUC has been working to further improve its asset management and inspection enterprise systems over the last few years. Data governance is an enabling investment that supports the overall effort of mitigating wildfires. Proper data governance will support the tracking of events that could lead to a wildfire, and tracks the progress of electric system upgrades.

KIUC recognizes the importance of carefully tracking and managing WMP data for all its activities and initiatives performed in accordance with the WMP. KIUC records and manages data collected from numerous sources, in varying formats, and in several storage locations in the execution of its wildfire mitigation efforts. Table 4 below highlights the types of data collected and the repository in use by KIUC for such data.

Table 4. Data Governance

Data Source	Storage Location	Data	Storage Type	Update Process
Vegetation Management	KIUC servers and Cloud-based storage system	Vegetation findings and completed sections	Excel, Geo Database, Cloud-based	Manual, Mobile Device
Substation Inspections	Paper-based	Asset condition, type and findings	Excel, Binder	Manual
UAV Inspections	KIUC servers and Cloud-based storage system	Photo and video records	Polehawk web portal, Cloud-based	Manual
Pole Inspections	KIUC servers	Inspection findings	Cloud-based	Automatic via field equipment
Pole Replacements	KIUC servers	Rotten pole data and replacement status	Excel, Binder; Moving to digital cloud-based in 2025	Manual
Outage Management System	KIUC servers	System Average Interruption Frequency Index (SAIFI), Customer Average Interruption Duration Index (CAIDI)	Digital	Automatic

8.3 Alignment with KIUC EPRP and Emergency Planning Efforts

KIUC submits its Emergency Preparedness and Recovery Plan (EPRP) to the Hawaii Public Utilities Commission annually,[28] and this WMP is intended to align with the EPRP. As part of this

[28] The EPRP contains information considered by KIUC as extremely confidential, including information related to the security of KIUC's facilities and operations that, if disclosed publicly, could result in increased risks to KIUC's facilities, create serious security issues, and jeopardize the effectiveness of the ability to successfully carry out the plan. Among other risks, disclosure of the information could adversely impact KIUC's ability to respond to potential terrorist threats, making its customers and system operations vulnerable to sabotage or terrorism. In addition, this plan contains information on security readiness and recovery plans traditionally kept confidential in order to protect the integrity and security of

annual effort, KIUC reviews any experiences learned and/or new information that has become available since the time of the last annual report and revises/updates the annual EPRP accordingly.

The EPRP details procedures for monitoring and preparing for potential emergencies; mobilization and response efforts; damage assessments during and following the event; restoration efforts; efforts to maintain business continuity; and communication and coordination efforts with KIUC's members/customers and with various organizations and stakeholders during all phases of these efforts. The EPRP covers various areas, including SCADA recovery, information technology recovery, materials management, security readiness, and crises communications.

While the EPRP primarily focuses on damage caused by major storm events such as a hurricane, it is designed to be used by KIUC in any disaster or emergency situation that may impact the electrical system and thus, in the event of a wildfire event, is intended to work together with the WMP. The EPRP recognizes that major storms or emergencies can have varying levels of advance notice, some on very short notice and others with several days or more to prepare. Consistent with the WMP, the EPRP's focus is on taking advantage of any pre-emergency time to prepare for and set up systems and procedures to monitor and attempt to minimize and prevent any potential damage, to recover electric service in the least reasonably possible time period, and for KIUC personnel to be dispatched to assist in assessment and emergency repair purposes when it is safe to commit resources to recovery efforts. In facing a disaster or a potential disaster, KIUC's highest priority is the **safety** of its employees, its members/customers and the public.

Roles of KIUC's Emergency Restoration Team are defined in the EPRP. The EPRP outlines workforce duties, coordination, outside assistance, restoration priorities, and coordination with outside agencies among other preparations.

An additional component of KIUC's emergency preparedness and response planning includes the development of a Crisis Communication Plan (CCP). This document outlines the messaging response actions KIUC managers and leadership should take to address various situations that could have a potentially significant impact on the members/customers and organization. The CCP establishes guidelines to streamline communication and coordination for extensive emergency response activities. The CCP also identifies core crisis communication team members, provides key messages, response timelines and checklists, along with templates for press releases and website/social media postings.

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system operations and to minimize the potential for interference with both normal operations and restoration/recovery efforts. Accordingly, maintaining the confidentiality of the information contained in the plan is necessary to prevent harm to KIUC, its employees, its members/customers and the public in general.

8.4 Impact of WMP on Members/Customers

KIUC does not anticipate an overall decrease in reliability due to its current WMP programs. Increased VM and inspection work should result in reduced outages over time. However, when high fire risk conditions exist, such as an RFW combined with high winds, KIUC may selectively disable automatic reclosing as a precautionary measure as discussed above. This practice increases the risk for power to be interrupted for longer than usual since faults must be visually inspected before re-energization for safety reasons. The fire-safe alternate recloser setting significantly decreases the risk of fire posed by auto reclosing, or manual testing. KIUC will continue to use, analyze, and modify this practice as necessary and will fold this practice into its existing Outage Communication Plans to ensure they are considered.

The co-op maintains a list of members/customers who have proactively identified themselves as either elderly (age 62), have a disability, or have special medical needs. An enrollment form is available on KIUC's website. When time permits (e.g., when there is advance notice of a possible RFW, PI or other weather event), KIUC makes efforts to notify these members of potential service interruption. KIUC has subscribed to a service that allows for immediate mass notification of members in the event of emergencies. In partnership with KFD and KEMA, KIUC has developed a brochure to assist these members/customers in preparing a contingency plan for backup power in the event of loss of electricity.

8.5 Monitoring and Auditing of the WMP

As noted in Section 1.1 (Purpose of the Wildfire Mitigation Plan), the WMP will be amended and updated as KIUC gains further experience in implementing mitigation programs to address known and potential risks, as new information and technologies change and emerge, and to align with any subsequent legislative or other mandates that may arise. As part of this effort, the WMP will be included as a discussion item on the agenda of regularly scheduled internal management meetings. Reports of the WMP's progress and risk reduction impacts will be developed annually and circulated to appropriate co-op staff to generate collaborative discussions.

At the end of each year or as timing or needs may otherwise dictate, KIUC will also assess company-wide wildfire mitigation efforts in accordance with the WMP for progress and adherence, to identify any deficiencies as discussed in Section 8.6 below, as well as to identify areas for refinement and improvement. All known fire starts within KIUC's service area will be tracked. Lessons learned and new or refined/updated practices established during these efforts will be incorporated into the next iteration of the WMP.

8.6 Identifying Deficiencies in the WMP

The COO is responsible for ensuring that the WMP meets all public agency guidelines to mitigate the risk of KIUC'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 CEO, and then discussed and incorporated into future mitigation and planning efforts and for subsequent incorporation into the annually submitted WMP.

The COO, or designee, will be responsible for spearheading discussions on addressing any plan deficiencies and collaborating on solutions when updating the WMP efforts. At any point in time when deficiencies are identified, the COO or their delegates are responsible for making any appropriate policy adjustments. KIUC staff and qualified stakeholders are encouraged to bring any potential deficiencies to the attention of the COO, as well as any recommended areas of improvement and refinement. The COO, along with the appropriate staff, will evaluate each reported deficiency and/or recommendation, and if determined to be valid, shall record the deficiency and/or recommendation for further consideration and/or action.

8.7 Performance Metrics

As the WMP is still in the initial stage of implementation, relatively limited data is on hand and KIUC had not previously identified metrics related specifically to WMP performance. Going forward, KIUC has selected several metrics (Table 5 below) based on information that KIUC can easily maintain and compile and that can be used with the intent to gauge the effectiveness of the various programs and strategies outlined in the WMP, as well as evolving fire-weather conditions within the service area.

The annual tracking of these metrics will help identify circuits most susceptible to unexpected outages, time-of-year risks, and the adequacy of the VM program and asset inspection schedules. As results of the programs and efforts become evident and additional data is collected, KIUC will identify areas of its operations that may require a different or refined approach. The selected metrics, as with other aspects of the planning efforts, will likely evolve in future iterations of KIUC's WMP. Following any wildfire event, regardless of the cause, management will review and discuss what worked and what could have been done differently with staff in a roundtable discussion to improve practices moving forward.

Table 5. Performance Metrics

Metric	Meaning
Number of Red Flag Warnings in the service area	This metric will provide an indication of the overall threat level for the year and any increasing/decreasing trends from prior years
Number of times system is in "Fire-safe Mode"	This metric will provide an indication of the overall threat level for the year and any increasing/decreasing trends from prior years
Number of fire ignitions[29]	This metric will track any fire ignition caused by KIUC electric equipment.
Number of Power Isolation events	This metric would provide a correlation between the number of RFWs in comparison to the number of PI events KIUC decided to implement
SAIDI of Power Isolation events	This metric may provide an indication of the effectiveness of KIUC's WMP efforts

8.8 Quality Assurance and Quality Control

KIUC is in the process of enhancing its system-management programs to further assure that, to the extent possible, the co-op's overhead system, facilities, and equipment are unlikely to become a fire ignition source. These programs generally encompass inspection and maintenance functions and have been modified to focus on minimizing the probability that damaged or aging KIUC facilities will provide the ignition source for a fire.

In addition, KIUC has implemented Quality Assurance (QA) and Quality Control (QC) standards and programs throughout its service area, with a special focus on high-risk areas. These proactive programs are designed to identify potential structural and mechanical problems before they fail.

Where the facility in need of repair is owned by a party other than KIUC (e.g., by a communication infrastructure provider), KIUC will issue a notice to repair to the facility owner

[29] For purposes of this metric, a reportable fire ignition event is defined as follows: (1) a KIUC facility was associated with the origin of the fire; (2) the fire was self-propagating and involved the ignition of material other than electrical and/or communication facilities; (3) the resulting fire traveled greater than one linear meter from the ignition point; and (4) KIUC has knowledge that the fire occurred.

and work with the facility owner to the extent feasible to have them complete the necessary repairs promptly.

KIUC also closely monitors cost-effective emerging or changing technologies, legislative and regulatory changes, and evaluates the effectiveness of the WMP following each PI or wildfire event to determine any refinements, updates and improvements for the safety of staff, facilities, members/customers, and the community.

8.9 Inspection Quality Control Process

KIUC routinely coordinates and monitors the effectiveness of inspections with Operations staff, its vegetation and tree trimming contractors, and any company with whom KIUC has contracted for pole inspections to ensure that all system inspections are completed in a timely manner and meet or exceed the requirements established by law. Any deficiencies identified through this process are addressed.

Appendix A

Estimated WMP Costs and Timelines (2025 to 2027)

Table 6. Estimated WMP Costs ($ in thousands)

	2025	2026	2027
WMP Development	$ 20-50	$ 20-50	$ 20-50
WMP Implementation	$ 5,600 to 9,020	$ 10,460 to 18,920	$ 13,560 to 20,920
WMP Administration	$ 750	$ 1,000	$ 1,200

Table 7. Timelines for WMP Implementation

			Cost Estimate ($ in thousands)					
			2025		2026		2027	
Program	**Overview**	**Status**	**Low**	**High**	**Low**	**High**	**Low**	**High**
VM Plan: Develop and Adopt (Chapter 6)	Formal VM program	Completed 2024	N/A					
VM Plan: Implementation (Chapter 6)		Ongoing	3,000	3,000	3,000	3,000	3,000	3,000
Daily Situational Awareness Tool (Sect. 7.1)	NDRS-based early warning of fire danger conditions	In develop-ment	-	20	-	20	-	20
Tempest Weather Stations: Purchase and Install (Sect. 7.1.1)	Deploy KIUC-owned weather stations in the service area	Completed 2024	N/A					

Program	Overview	Status	Cost Estimate ($ in thousands) 2025 Low	2025 High	2026 Low	2026 High	2027 Low	2027 High
Pole Inspection (Sect. 5.4)	In-house wood pole inspections, including using Thors Hammer	Ongoing	100	100	60	100	60	100
Pole Replacement (Sect. 2.1.8)	High priority poles replaced with composite	Ongoing	1,500	3,000	2,000	3,000	2,000	3,000
Bare Wire Replacement (Sect. 4.2)	Replacement of open wire secondary with covered conductor	Ongoing	400	400				
UG Conductor	Replace overhead conductor with underground conductor in select areas	Ongoing	TBD					
UAV Inspections (Sect. 5.8)	Inspect KIUC facilities and vegetation using drones	Ongoing	600	1,000	200	300	200	300
Tree wire replacement (Sect. 4.5)	Replace bare overhead conductor with covered conductor	Ongoing	-	500	200	500	300	500
Arrester replacement (Sect. 4.6)	Replace existing arresters with non-expulsion arresters	In procure-ment			1,000	3,000	2,000	3,000
Fuse replacement (Sect. 4.6)	Replace existing fuses with non-expulsion fuses	Fuse study ongoing			4,000	8,000	6,000	10,000

			Cost Estimate ($ in thousands)					
			2025		2026		2027	
Program	**Overview**	**Status**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Cameras and Other technology (Sect. 7.1.2)	Install camera systems paired with AI	Ongoing	-	1,000	-	1,000	-	1,000
Totals			5,600	9,020	10,460	18,920	13,560	20,920

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Appendix B

Definitions

Circuit Breaker: An electrical switch designed to protect an electrical circuit from damage caused by overcurrent/overload or short circuit. The basic function is to interrupt current flow after protective relays detect a fault.

Co-op: Kaua`i Island Utility Cooperative.

Danger Tree: A danger tree is any tree, on or off the right of way, that can contact electric power lines. A **danger tree** may be completely healthy and intact, or it may be sick or dead. Even a healthy tree could sustain damage in a severe storm and impact nearby power lines, thus the potential for "danger."

Distribution System: The final stage in the delivery of electric power carrying electricity from the transmission system to individual consumers. The KIUC distribution system includes 12.47Kv lines not tied to generation facilities.

Defensible Space: An area around a structure, either natural or manmade, where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildfire and the structure. In practice, it is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

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.

Fire Weather Watch: A term used by fire weather forecaster to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather. A watch means critical fire weather conditions are possible, but not imminent or occurring.

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

Hazard Tree: A specific type of danger tree that poses a greater likelihood of causing damage to electric power lines or equipment. In this case, the tree is structurally unsound and positioned in a way that it could fall onto conductors.

Landscape: Refers generally to the area of interest in a project or study and could refer to modeled or on-the-ground conditions.

KIUC: Kaua`i Island Utility Cooperative.

Recloser: Recloser is a device that is used in over-head distribution systems to interrupt the circuit to clear faults. Automatic reclosers have electronic control senses and vacuum interrupters that automatically reclose to restore service if a fault is temporary. There are several attempts that may be made to clear and reenergize 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 (or RFW)[30]: A term used by fire- weather forecasters to call attention to limited weather conditions of importance that 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. The criteria for Red Flag events per the Honolulu Weather Forecast Office are:

- A Keetch-Byram Drought Index (KDBI) greater than or equal to 600,
- Relative humidity less than or equal to 45 percent, and
- Winds greater than or equal to 20 mph

Right-of-Way (ROW): The corridor of land under (and adjacent to) a transmission or distribution line.

Risk: A measure of the probability and severity of adverse effects that result from exposure to a hazard.

SCADA: 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 case of the transmission and distribution elements of electrical utilities, SCADA will monitor substations, transformers, and other electrical assets. It is possible to control or reset some 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 of several other important 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 System: The bulk delivery of electrical energy from a generating site to an electrical substation. At KIUC, for line maintenance purposes, the transmission system is comprised of 57.1kV (sub-transmission) structures, and switches.

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30 Source: https://w1.weather.gov/glossary/index.php?word=Red%20Flag%20Warning

Unmanned Aerial Vehicle (UAV): An unmanned aerial vehicle, or drone, is a powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely. Typically mounted with high resolution camera, and/or infrared, LiDAR equipment.

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

Vegetation Management: A broad term that includes tree pruning; brush removal through the use of 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, an unplanned, uncontrolled fire in a forest, grassland, brushland or land sown to crops.

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

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

Wildland Urban Interface (WUI): Line, area, or zone where structures and other human development meet or intermingle with vegetative fuels in wildlands.

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Appendix C

Acronym Glossary

AMSL	Above mean sea level
ANSI	American National Standards Institute
CCP	Crisis Communication Plan
CAIDI	Customer Average Interruption Duration Index
CEO	Chief Executive Officer
COO	Chief of Operations
CPR	Cardiopulmonary resuscitation
DSAT	Daily Situational Awareness Tool
ENSO	El Niño – Southern Oscillation cycle
EPRP	Emergency Preparedness and Recovery Plan
FWW	Fire Weather Watch
FWZ	Fire Weather Zone
GIS	Geographic Information Systems
HAZWOPER	Hazardous Waste Operations and Emergency Response
HECO	Hawaiian Electric Company
HWMO	Hawai`i Wildfire Management Organization
IR	Infrared
KBDI	Keetch-Byram Drought Index
KEMA	Kaua`i Emergency Management Agency
KFD	Kaua`i Fire Department
KIUC	Kaua`i Island Utility Cooperative
kV	Kilovolt
KWH	Kilowatt Hours
LiDAR	Light Detection and Ranging
MOU	Memorandum of Understanding
MW	Mega Watts
NESC	National Electric Safety Code

NFPA	National Fire Protection Association
NRECA	National Rural Electric Cooperative Association
NWS	National Weather Service
OCR	Oil Circuit Recloser
OH	Overhead
OEM	Office of Emergency Management
OMS	Outage Management System
OSHA	Occupational Safety and Health Administration
PI	Power Isolation
QA	Quality Assurance
QC	Quality Control
RFW	Red Flag Warning
ROW	Right-of-Way
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SOP	Standard Operating Procedure
TAB	Total Acres Burned
T&D	Transmission and Distribution
UAV	Unmanned Aerial Vehicle
UG	Underground
USFS	United States Forest Service
VM	Vegetation Management
WMP	Wildfire Mitigation Plan
WRMAG	Western Region Mutual Assistance Group