


SCE	Legal, Regulatory, and Compliance	Transmission & Distribution Utility Vegetation Management Program	Methodology	Doc. No.	UVM-04	 SOUTHERN CALIFORNIA EDISON Energy for What's Ahead SM
				Version	3	
Effective Date		4/1/24				
Supersedes		Version 2				
Hazard Tree Management Plan (HTMP)						

THIS DOCUMENT IS REQUIRED TO BE MAINTAINED IN ACCORDANCE
WITH ERCP COMPLIANCE DOCUMENT REQUIREMENTS

UVM-04

Utility Vegetation Management

Hazard Tree Management Plan

(HTMP)


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1 Introduction

1.1 Purpose

To identify, document, and mitigate trees that are located within the Utility Strike Zone (USZ) and are expected to pose a risk to electric facilities based on the tree's observed structural condition and site considerations. Identification and Mitigation of Dead and Dying trees is addressed in UVM-18, "Assessment and Removal of Dead and Dying Trees."

1.2 Objectives

To mitigate the potential risk to SCE's electric facilities from structurally unsound trees that can fail in total or in part, and palm trees that can dislodge palm fronds during high winds.

1.3 Additional Considerations

SCE manages hundreds of thousands of trees within and along easements and rights-of-ways (ROW). Given the magnitude, SCE cannot continuously assess every tree for possible defects. It is not possible to accurately identify or predict all trees that will fail, particularly during Force Majeure Events¹. These events could include unforeseeable weather events, or failures related to conditions that cannot be observed such as those related to root systems or the inner structure of the tree. Even under the best circumstances and with the highest standard of care, tree failure cannot be predicted with 100% accuracy. However, by exercising good professional judgment and using a systematic approach such as the one described in this plan, it is possible to significantly reduce the risk of tree failures that can damage electric facilities.


Additionally, SCE may be hindered from reducing potential tree risks by property owner opposition and limited access to private property and lengthy permitting processes with managing agencies. Customer refusals are processed in accordance with UVM-14B, "Manage Refusal Events – HTMP." Most trees that pose a potential risk to electric facilities are owned by public and private parties and SCE may have limited rights to enter properties to conduct assessments and perform mitigation tasks.

2 Applicability

This document is applicable to the operating units impacted by Energy Regulatory Compliance Program (ERCP) Compliance Requirements related to Vegetation Management, which include:

- Generation
- Transmission & Distribution

¹ Circumstances that are beyond a utility's control, including natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, wind shear, fresh gale, major storms, ice storms, and floods; human or animal activity such as logging, animal severing tree, vehicle contact with tree, or installation, removal, or digging of vegetation

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3 Definitions

Refer to the NERC Glossary of Terms, the E&C Shared Services Glossary of Terms (ECSS-02), and UVM Program Glossary of Terms (UVM-16) for any capitalized terms used in this document.

4 Document Detail

4.1 Tree Risk

For the purposes of this HTMP, the concept of risk takes into account the potential likelihood of a tree failure, or portions thereof, occurring that can adversely affect SCE's infrastructure, and the severity of the potential consequences.

4.2 Utility Vegetation Management Tree Risk Overview

During the inspection process, tree and site conditions will be assessed to determine tree risk and if work is required to mitigate the identified risk. Inspections to identify Hazard Trees may be conducted during routine patrols for compliance or during a dedicated Subject Tree risk assessment inspection.


Trees located within the USZ will be assessed to determine the potential risk to electric facilities. The tree assessment will yield a risk score and a priority condition for tree risk mitigation. In addition, palm trees located outside the USZ that could be subject to palm frond blow-in and/or where historical records exist of prior palm frond line contact will be assessed to determine risk using a unique palm scoring methodology. HTMP Tree Risk assessments can only be performed by Arborists certified by the International Society of Arboriculture.

A Level 1 Limited Visual Assessment is performed as the initial inspection process. If strike potential is identified during the Level 1 assessment within the USZ, a Level 2 Basic Assessment of the tree will be conducted. The assessment results are captured in SCE's Tree inventory as a Hazard Tree or Subject Tree. Appropriate mitigation will be performed when a Hazard Tree is identified.

4.3 Inspections

Scheduled Inspections

SCE performs routine inspections to identify work that is needed to maintain regulatory compliance and to identify and assess trees with strike potential which can be expected to pose a risk to SCE facilities. The frequency of these inspections is described in the Vegetation Management annual master work plan which aligns inspections for routine line clearing, hazard tree and dead and dying trees inspection cycles. Subject trees in TRI category A are inspected annually, and subject trees in TRI risk categories B, C & D are inspected on a 3-year cycle. All Subject Trees in SCE's High Fire Risk Area are inventoried. Subject Trees in non-high fire areas may be inventoried on a case-by-case basis. Dead and Dying inspections (reference

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UVM-18) are conducted in tandem with the Hazard Tree inspections as well as in areas historically impacted by infestations and drought in accordance with California's Task Force Tree Mortality Map.

Unscheduled Inspections

SCE Incident Management Teams may perform Hazard Tree inspections, as needed, after major storms, high wind events, and fires. The need for these inspections is determined based on the severity of the event and resulting possibility of damaged trees.

SCE may perform separate pre-fire season inspections in designated Public Resource Code (PRC) areas, Extreme (Tier 3) and Very High (Tier 2) fire areas as needed.

4.4 Circuit/Grid Risk Assessment – Tree Risk Index

The work plan for Hazard Tree inspections is based on SCE's Tree Risk Index (TRI) rating from Vegetation Management work areas. The TRI model is refreshed annually in collaboration with SCE Asset Strategy and Planning team by analyzing structures in HFRA for the risk of vegetation contact and probability of ignition (POI) using various inputs from such sources as Technosylva and SCE proprietary databases (TCCI, covered conductor circuit data, etc.). The TRI risk model applies to VM grids in HFRA and identifies four risk categories A, B, C & D, with category A being the highest risk.


4.5 ANSI A300 (Part 9) Assessment Levels

Level 1: Limited Visual Assessment

This is accomplished by conducting an assessment from one side of the tree (side nearest the electric facilities) and can be ground-based, vehicle-based, or aerial-based (e.g., fixed-wing, helicopter, drone, LiDAR), as appropriate for the site conditions, type of infrastructure, and tree population being considered. A Level 1 assessment focuses on identifying obvious tree defects (i.e. dead branches, leaning) that are observable from the side of the tree nearest the electric facilities. If a condition of concern is identified during the Level 1 assessment, recommendations are developed regarding possible mitigation. If the Level 1 assessment cannot sufficiently determine the severity of the condition, a Level 2 assessment is conducted.

Level 2: Basic Assessment

This is a detailed ground-based visual assessment of an individual tree and its surrounding site. A Level 2 assessment may include walking completely around the tree—looking at the site, buttress roots, trunk, and branches. Many trees that pose a potential risk to electric facilities are located on private property and beyond the edge of the utility ROW, which may restrict access. Severe terrain or other obstacles may also prevent access. As such, there may be a limited opportunity or ingress to do a 360° assessment of an individual tree.

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Level 3: Advanced Assessment

This is an assessment of a tree to provide detailed information about specific tree parts, defects, targets, and/or site considerations. Specialized equipment, data collection, and analysis, and expertise could be required. Note: SCE does not utilize Level 3 assessments for HTMP inspections.

4.6 Tree Risk Assessment

Hazard Tree Characteristics and site attributes that indicate possible hazard conditions are listed in Attachment A. These characteristics are used to risk rank a Subject Tree. Both tree and site attributes may impact the stability of a tree and are considered when performing a tree risk assessment. Tree risk assessments result in risk scores that range from 0 to 100, and risk scores ≥ 50 typically require remediation. Information collected during a tree risk assessment is identified in UVM-09, "Inspection Manual." The assessment results are captured in the work management system in order to track and manage the prescribed work or other mitigation.

4.7 Hazard Tree Characteristics

Attachment A identifies hazard tree Attributes and site attributes that should be considered during the Tree Risk Assessment to determine whether a tree is a Hazard Tree. If determined to be a Hazard Tree, mitigation is documented. Detailed Hazard Tree Program information is contained in the latest approved version of the "Hazard Tree Program Assessment Guide."

4.8 Work Priority Levels

Identified trees are mitigated based on risk. UVM-08, Vegetation Threat Procedure describes the criteria for work priority determination.

4.9 Mitigation Actions

Complete Tree Removal – Complete tree removal is the preferred mitigation.


Complete tree removals must meet one of the following criteria:

- The distance between the tree and SCE's lines or facilities is equal to or less than the height of the tree and the Make-Safe mitigation (see below) is not feasible.
- The tree is expected to pose a risk to electric facilities and shows characteristics that make the tree, or parts thereof, unstable, and the Make-Safe mitigation is not feasible.

Make-Safe

In some situations a complete tree removal may not be required to mitigate the risk the tree poses to electric facilities. If appropriate conditions exist, portions of a tree can be pruned or removed to mitigate the risk.

- The hazard condition is not caused by or exacerbated by site consideration.

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Monitoring

Assessed trees may be monitored when they are considered stable and are not expected to pose a risk to electric facilities in the foreseeable future, but show signs of:

- An emerging Hazard Tree Characteristic
- Changing Site Considerations.

Property Owner Make-Safe

Only specially-trained and certified tree crews can work near a high-voltage electric facility, which is defined as within 10-feet. SCE provides outreach to communicate Electrical Hazard Awareness to property owners who plan to hire their own tree workers to prune or remove trees near electric facilities. This includes work on any tree within 10-feet of electric facilities or trees that could come in contact with electric facilities if they fall.

As part of the UVM Program, SCE will assess and remove portions of trees to a level that would allow workers that are not qualified to work within 10-feet of high-voltage electric facilities to remove or prune the remainder of the tree.

4.10 Tree Replacement


The UVM Program includes a tree replacement offering for trees that qualify under specific criteria for tree removal. (Tree Replacement offering is under development.)

4.11 Removal, Hauling and Staging of Trees, Slash or Chips

SCE removes vegetation in accordance with local laws and/or regulations that govern the specific area. On private property, SCE will remove all debris from the property when requested. Where practical, SCE seeks to reuse vegetation material in communities and in renewable energy projects.

5 Approvals

Program Manager	Signature	Date
[NAME REMOVED], Principal Manager	[NAME REMOVED]	3/27/24

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6 Revision History

Revision Number	Date	Description of Revision	By	Next Review Date
1	8/16/18	Initial release for UVM Program	[NAME REMOVED]	2019
2	5/17/19	General Document Refresh	[NAME REMOVED]	5/17/20
3	4/1/24	General Document Refresh Added attachment A	[NAME REMOVED]	4/1/25

7 References

External References

ANSI A300 (Part 9): Provides guidelines for the practice of tree risk assessment and standards for writing specifications

NERC Glossary of Terms: https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf

Internal References

ECSS-01, E&C Shared Services Glossary of Terms


UVM-08, Vegetation Threats

UVM-09, Inspection Manual

UVM-14, Manage Refusal Events

UVM-16, UVM Program Glossary of Terms

Hazard Tree Program Assessment Guide

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8 Distribution and Data Retention

The official version of the document shall be stored in the T&D Vegetation Management UVM Program SharePoint Document Library while in effect and retained for at least ten (10) years thereafter.


Distribution list:

- T&D VM Managers
- E&C Program Management Office
- Impacted OU Touchpoints

9 Key Contacts

UVM Principal Manager, Operations: [NAME AND PHONE NUMBER REMOVED]


UVM Senior Manager, Compliance: [NAME AND PHONE NUMBER REMOVED]

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Attachment A
Hazard Tree and Site Attributes


Field	Value	Guidelines	Determining Factors
Fire Impact (FI)	Swamp, marsh or bogland	Ignition probability factor - is a scoring component of the risk score.	Wetlands, frequently or continually inundated with water. Near streams, poor drainage
	Residential or Agricultural irrigation		Areas cleared for crops, typically areas of low-lying vegetation
	Buildings or accessory structures nearby		Residential neighborhoods, commercial developments, pavement
	Forested/timber vegetation with cleared understory	Multiple selection options	Dense forest, removal of ladder fuels, clearing due to fire or local agency regulations
	Grassland-dominated vegetation, with occasional to scattered trees	Selection list is ordered from lowest scoring impact on top, to highest scoring impact on bottom.	Plains, prairies, areas of native grasses
	Shrub-dominated vegetation (chapparal), with occasional to scattered trees		Dry conditions in summer, dense areas of shrubs, thorny bushes, native vegetation typically does not exceed 10-15 ft in height
	Forested/timber vegetation with dense understory, heavy leaf litter or ladder fuels		Dense forest, immature trees and shrubs, high degree of horizontal and vertical continuity
Tree Risk Index (TRI)	A, B, C, or D	Distribution Circuit/Grid assignments are ranked into 4 TRI Categories. A has the highest risk, whereas D has the lowest	Auto-populated based on circuit/grid in High Fire Risk Areas

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RISK ASSESSMENT			
Field	Value	Guidelines	Determining Factors
Tree Species Risk Factor (RF)	Low, Medium, High	Auto-populated, single choice, based on species selected.	Pre-determined, based on species selected.
Tree Defects	Major root defects (exposure or girdling)	<p>Exposed roots – roots which are above grade and visible.</p> <p>Girdling Roots – root that encircles all or part of the tree trunk or the other roots, constricting the vascular tissues and inhibiting secondary growth and the movement of sugar to the root system resulting in root death.</p>	<p>Severe loss of root mass due to erosion or construction (>50%)</p> <p>Girdling Roots – significant swelling above girdling roots embedded in tree trunk or structural roots, poor taper is evident.</p>
	Moderate root defects (exposure or girdling)		<p>Exposed Roots - More than 25% but less than 50% of total Root mass is visible. Presence of undermined root system leading to some loss of structural integrity and root instability.</p> <p>Girdling Roots – roots embedded in tree trunk or structural roots; poor taper may be evident.</p>
	Minor root defects (exposure or girdling)		<p>Exposed Roots - Less than 25% of total Root mass is visible. Minor root instability. Surface roots.</p> <p>Girdling Roots – presence circling roots around base of tree trunk or structural roots</p>
	Epicormic sprouts (Crown & Branches, Trunk)		Abnormal new growth from the base or main trunk or lateral of an established tree. Weak unions because lack of central stem attachment.

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RISK ASSESSMENT			
Field	Value	Guidelines	Determining Factors
Tree Defects (Continued)	Fungal Fruiting Bodies (Trunk, Roots & Root Collar)	Look for conks on trunk or root rot mushroom around base of trunk.	Presence of fruiting bodies-posing some structural integrity defect to the tree. Exception for presence of mycorrhizae type growth which is not impactful to tree health.
	Structurally unsound trunk	Taper is the change in diameter over the length of trunks, branches, and roots. Taper is important for even distribution of mechanical stress.	Tree may be reaching for sunlight, developing a widening crown with massive branches. Trunk may not be able to support the weight of crown-overburdened trunk.
	Included Bark (Crown & Branches, Trunk)	Included bark is where barks grow against one another at a narrow angle branch union without forming a branch bark ridge.	Select if branch union failures at point of included bark have the potential of tree, or parts thereof, to impact target, indicates signs of structural instability.
	Major codominant top (within bottom half of tree)	Identify codominant stems (competing leaders for sunlight typically identified with excurrent trees, but this defect can be used for any species when applicable).	Split origin at or below the bottom ½ of tree height.
	Minor codominant top (within top half of tree)		Split origin at or higher than top ½ of the tree height.
	Basal Wound (Trunk, Roots & Root Collar)	Any part of the main stem/trunk. Any damage to trunk that can cause future decay. Can typically be associated with some level of rot. Wounds can be natural or mechanical damage from human interference.	Wound generally greater than 10% of the total circumference. Scars from a previous wounds can also indicate previous basal wounds. Dead wood or cavity exposed at the base of a tree.
	Poor trunk taper	Taper is the change in diameter over the length of trunks, branches, and roots. Taper is important for even distribution of mechanical stress.	Dense forest with young trees reaching for sunlight. Ex) Pistol butted, crooked top, curved trunk, trunk girdled/restricted.

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Field	Value	Guidelines	Determining Factors
Tree Defects (Continued)	Seams/Ribs (Crown & Branches, Trunk)	Rib - longitudinal bulge of response wood growth. Seam - line formed where two edges of bark meet at a crack or wound. Coincides with Minor Rot	Visible gap/space within the separation of bark and wood and can look into the heartwood; NOT a cavity.
	Major cracks (Crown & Branches, Trunk)	A crack can be defined as a separation in wood fiber or a split through the bark into the wood. If severe enough may result in failure by breakage. This may warrant a Priority 1 mitigation. Associates with damaged/dying tree part(s)	Crack that goes completely through the stem or branch. 2 or more cracks on the same segment with a cavity or extensive decay.
	Minor cracks (Crown & Branches, Trunk)		Narrow breaks or fissures in stems or branches. Any separation of bark and wood extends into heartwood.
	Major Rot (Crown & Branches, Trunk, Roots & Root Collar)	The most common indicators of decay, strength loss, or missing wood are the presence of old wounds or branch stubs that may have allowed decay fungi to enter the tree. Response growth patterns, such as swelling, bulges, or ridges on the trunk or branch that form as the tree compensates for wood strength loss are other indicators. Wood that could fail under pressure. Visible cavity, dead wood from old cut at branch junction, bark shedding or heart rot. Visible fungal fruiting body anywhere on the tree or around root collar.	Indicators of major rot would be found on > 40% of the circumference of any stem, branch, or root collar. Measurements are based on visual ground-based assessments. Decay/Rot % is estimated and not measured with specialized equipment.

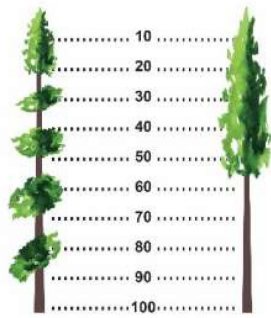
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RISK ASSESSMENT			
Field	Value	Guidelines	Determining Factors
Tree Defect (Continued)	Moderate Rot (Crown & Branches, Trunk, Roots & Root Collar)	Decaying trees are more prone to failure, but the presence of decay alone does not indicate that a tree is highly defective. Some decay, especially in the interior, is tolerable. When decay is discovered in a tree, it is important to determine its extent and the amount of remaining sound wood.	Moderate rot indicators of decay would be found on less than 25% of the circumference of any stem, branch, or root collar.
	Minor Rot (Crown & Branches, Trunk, Roots & Root Collar)	Decaying trees are more prone to failure, but the presence of decay alone does not indicate that a tree is highly defective. Some decay, especially in the interior, is tolerable. When decay is discovered in a tree, it is important to determine its extent and the amount of remaining sound wood. Assessor shall categorize rot taking into consideration CODIT.	Visible wounds or calluses with distinct swelling, no visible insect infestation or fruiting bodies, minor crown galls and/or small seam/rib, dead wood solid to touch.
	Major pest infestation (Crown & Branches, Trunk)	Inspect for holes or other evidence of infestation of insects, parasites, or mistletoe present on a tree.	Nuisance spreads more than 25% of tree. Presence is posing significant structural integrity and lack of vigor to tree.
	Minor pest infestation (Crown & Branches, Trunk)	Note: Woodpecker or Sapsucker exploratory & feeding holes do not generally impact structural integrity of a tree.	Nuisance spreads more than 10%, but less than 25% of tree. Presence does not generally damage the structural integrity of the tree.
	Bleeding/resinous (Crown & Branches, Trunk)	Associates with rot or insect infection. Associates with some level of rot not associated with recent pruning.	Visible canker with seeping saps or gummosis.

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Field	Value	Guidelines	Determining Factors
Tree Defects (Continued)	Weak, unsound branch attachments (Crown & Branches)	Weak attachments may be naturally occurring or caused from previous wounding. Some species may be more prone to developing poor branch aspect ratios (refers to the ratio between the diameter of 2 branches/trunks).	Any branch union with inadequate aspect ratio and NO branch bark ridge formed; any branch union with included bark. To be selected when branches can impact target if failed.
	Dieback of twigs or branches (Crown & Branches)	Dieback can indicate decline from disease or insect infestation (not from natural dieback).	Dieback is greater than 10% of live crown. Pattern of brown or discolored foliage from branch tips inward or wilting of new growth.
	Evidence of branch failure (Crown & Branches)	Trees that have experienced branch failure in the past may be more likely to have branches fail in the future.	Patterns of weak branch attachments, decay, decline, poor weight distribution, or other defects associated.
	Live Crown Ratio <50% (Crown & Branches)	<p>The ratio of crown length to total tree height. Regardless of any human or natural interference.</p> <p>This may indicate lack of vitality and decline OR may only be a result of site condition (ex. smaller tree in a stand has a short canopy due to competition and shading).</p>	<p>Less than 50% of overall tree canopy is present.</p> 
	Dead top (Crown)	Any portion of dead top in a crown.	Typically, the top.
	Mistletoe (widespread)	<p>Trees can become more easily prone to disease and insects due to stress from mistletoe.</p> <p>Especially stressful for trees during series of drought.</p>	Nuisance spreads more than 10% of canopy. Presence does not generally damage the structural integrity of the tree.

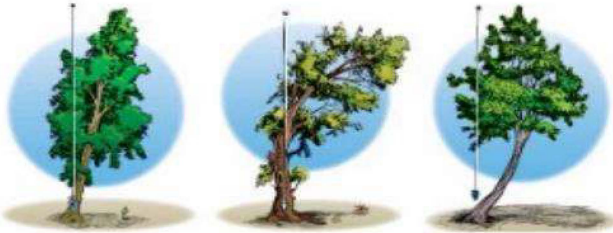
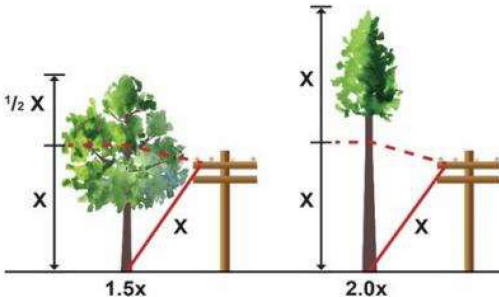
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Field	Value	Guidelines	Determining Factor
Site Condition Attributes (SCA)	No Impact		Negligible to no site condition issues apparent.
	High stand density with single species composition (monocultures)	Multiple selection options- can select a maximum of 3 attributes. Select the site conditions with the most considerable impact to the tree. Selection list is ordered from lowest scoring impact on top, to highest scoring impact on bottom.	Poor trunk tapering in a population due to shielding effects. Not necessarily limited to a single species composition.
	Area known to be affected by introduced tree pathogens (Bark Beetle)		Within same span or parcel as a beetle-killed tree. Bark Beetle pitch tubes can be seen on trunk. SCE DRI tree tags are also indicators.
	Change in Grade		Gradient is changing; steep slope area that may impact stability. No % threshold for slope is established.
	Disturbance to Landscape Natural or Unnatural	<i>Considerations for "Unnatural":</i> Managed landscape such as orchards and golf courses; frequent trampling of sites by vehicle/foot traffic; restriction of root growth due to presence of infrastructures	Change in landscape or restrictive condition as a result of human activities or other natural factors, such as excessive soil compaction.
	Fire Damage	<i>Considerations for "Natural":</i> animal burrowing sites; neighboring tree failure;	Burn mark in the immediate surrounding area. Evidence of previously fire damaged area
	Areas of recent clearing/ thinning/logging/new edge	restriction of root growth due to natural surfaces e.g., boulder; damage resulting from flood or undercut by watercourse	Look for new tree removals and stumps in the area. Population of Subject Trees may display poor tapering defects.
	Soil prone to slides	<i>Other Considerations:</i> Commercial development, or change in infrastructure, new pavement, freshly dug soil, Severed roots, etc.	Look for small granule soil, usually with high sand content; look for signs of soil erosion, such as landslide and alluvial fan. Typically located on sloped terrain.
	High winds		Area prone to regular high winds (Santa Ana's, Sundowner, etc.). On top of ridgeline; along the side of an exposed canyon

EXAMPLE

SCE	Legal, Regulatory, and Compliance	Transmission & Distribution Utility Vegetation Management Program	Methodology	Doc. No.	UVM-04	 <div>SOUTHERN CALIFORNIA EDISON[®] Energy for What's AheadSM</div>
				Version	3	
Effective Date		4/1/24				
Supersedes		Version 2				
Hazard Tree Management Plan (HTMP)						

Field	Value	Guidelines	Determining Factor
Tree Lean & Direction Strike Potential (TL)	Very Low	Identify the actual lean of the tree and use the 'Overall Condition' to identify the likelihood of failure and impact. Lean is the angle of the trunk displacement from tree base to tree top measured vertically. Illustrated here, from left to right, are a straight lean, bow, and corrected lean.	Tree is leaning away from target, limited to no strike potential
	Low		7 degrees or less, slight or no lean toward target. Use available 3 rd party app to measure the lean angle.
	Medium		8-25 degrees, moderate lean toward target Use available 3 rd party app to measure the lean angle.
	High		Greater than 25 degrees, heavy lean toward target Use available 3 rd party app to measure the lean angle.
	Picture credited to Bryan Kotwica		
Tree Height Factor (THF)	RCD – 1.0x	Ratio of tree height to the distance between closest conductor and tree base. The top part of the tree that will fall over the conductor. Refer to UVM 02 and UVM 03 for Clearance Definitions.	Top may strike
	1.1x - 1.9x		Top half will strike
	2.0x +		Will strike at halfway or lower part of tree
			

EXAMPLE