

Substation Fire Hardening

SUMMARY

This utility procedure provides instructions on establishing inspection criteria for fire hardening of PG&E substations. The locations subject to fire hardening inspections are the same locations within the overall supplemental inspection program defined in TD-3328S Substation Supplemental Inspection Program irrespective of their inspection cycle. The program is intended to reduce the risk of outward spread of a fire that may occur within these facilities. For this document, these stations will be referred to as the fire hardening annual inspections and vegetation maintenance program.

In addition, this procedure is intended to minimize the risk of fires and to ensure public safety by implementing guidelines provided in the California Public Resource Code Section 4291 (Defensible Space).

This procedure applies to permanently installed facilities. Temporary facilities are exempt from this procedure. Examples of temporary facilities are construction trailers, refuse dumpsters, etc.

Level of Use: Informational Use

TARGET AUDIENCE

Electric Substation and Natural Resource Management Defensible Space (NRM-DS) employees or contractors providing SME inspection and performing prescribed work.

SAFETY

Performing this procedure will not raise the risk of a specific hazard to personnel, public, or equipment.

BEFORE YOU START

1.1 IDENTIFY the following:

- Substation parcel boundaries
- Defensible space boundaries AND requirements

1.2 OBTAIN substation defensible space zone map from Natural Resource Management Defensible Space (NRM-DS).

1. REVIEW site specific defensible space maps provided by NRM OR, posted adjacent to the single line diagrams in the control room of each substation located within the fire hardening annual inspections program.

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PROCEDURE STEPS

1 General Facility Inspection

- 1.1 Between November 15th of the prior year and May 31st of the current year, ENSURE Natural Resource Management Defensible Space (NRM-DS) performs an inspection of defensible space criteria herein for each substation included in the fire hardening annual inspections program.
- 1.2 ENSURE the following is included in the yearly inspection:
 1. INCLUDE the following for needed vegetation work for current calendar year:
 - Identification
 - Data collection
 - Prescription
 - a. INCLUDE identifying the following within established defensible space zones OR, PG&E parcel boundary, whichever is greater:
 - New hazard trees
 - Weed AND grass abatement
 - Encroaching brush
 - Cut-stump regrowth
 - Removal of any combustible material
 2. START inspection at main access point OR, gate to facility.
 3. CONFIRM main facility security gate (substation only) has signage posted with the following:
 - Site Name
 - Address
 - 24 HR Emergency Telephone Number

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1.2 (continued)

4. CONFIRM access roads AND substation gates have both of the following:
 - Unobstructed width of NOT less than 20 feet.
 - Unobstructed vertical clearance of NOT less than 13 feet 6 inches. (California Fire Code, Section 503 – Fire Apparatus Access Roads).
5. IF in a rural area where 20 feet horizontal clearance is NOT obtainable,
THEN CONFIRM access road AND primary gate provide all the following:
 - Minimum unobstructed 10 foot traffic lane.
 - 14 feet unobstructed horizontal clearance.
 - Unobstructed vertical clearance of 15 feet up to facility parcel boundary OR, within 150 feet of facility primary access gate, whichever is greater. (California Board of Forestry and Fire Protection – SRA Fire Safe Regulations, Section 1273.10).
 - a. IDENTIFY any trees that should be mitigated by way of trim or removal: For example:
 - Hanging over
 - Exhibit decay OR disease
 - Defects
 - Previous Failure OR Significant Injury
 - Exposed root ends
 - Significant main stem lean towards access roads AND gates that can potentially fail or prevent access

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1.2 (continued)

6. CHECK there are NONE of the following on facility parcel:

- Trespassers
- Abandoned vehicles
- Dead vegetation
- Abandoned debris piles
- a. IF any are present,

THEN REPORT findings to Substation Maintenance Supervisor to resolve issue with NRM-DS OR Corporate Security.

2 Retention Basin Inspection (Substation Only)

2.1 ENSURE access roads to retention basins are kept clear of the following:

- Equipment
- Debris
- Vegetation

2.2 ENSURE there is NO debris OR vegetation in the following:

- Drainage grates
- Drainage ditches
- Retention basins

2.3 ENSURE there is NO vegetation OR combustible materials within 15 feet around the following:

- Retention basin
- Drainages
- Bank
- Outer edge

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3 Defensible Space Requirements

3.1 ENSURE site specific defensible space maps are posted at each facility within the fire hardening annual inspections program adjacent to single line diagrams in control rooms.

1. REFER TO Figure 1. Example of Defensible Space Zones.
2. ENSURE maps are current AND reflect any changes to site.
 - **ZONE 1 - The Clean Zone** creates a firebreak by removing all vegetation and combustibles at a minimum circumference of 30 feet around the facility as measured from all outermost buildings or equipment where permitted. Combustible material may include logs, wood poles, woody debris, pallets, mattresses, appliances, and otherwise illegally dumped refuse.
 - **ZONE 2 – Reduced Fuel Zone** is the area that extends out from the 30-foot clean zone to 100 feet away from the outermost building or equipment. This area is designed to have a reduced fuel load to inhibit the progression and reduce the risk of a fire moving through the zone.
 - a. CONTACT Natural Resource Management (NRM) to update maps.

Figure 1. Example of Defensible Space Zones



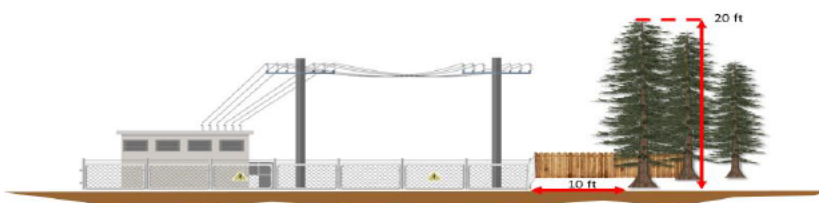
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NOTE

Clearance beyond PG&E's property line may be required to obtain 100 feet of defensible space. Clearance on adjacent property must only be conducted following written consent by the adjacent landowner, as described in Section 5.1.

- 3.2 ENSURE NO vegetation is present within primary substation security fence nearest to energized equipment OR substation structures.
- 3.3 ENSURE all invasive AND fire-prone vegetation on PG&E parcel within 100 feet from nearest energized equipment is removed.
- 3.4 ENSURE NO vegetation is present that is tall enough to potentially strike equipment, fences, buildings AND OH conductor in event of full OR partial failure.
 1. CONSIDER the following tree health factors which include but are NOT limited to:
 - Height (SEE Figure 2. Tree Factor-Height)
 - Significant lean
 - Weak limb attachments OR load
 - Dieback
 - Defect
 - Disease
 - Evidence of previous failure, etc.
 2. REMOVE any identified trees located on PG&E property.
 3. ASSESS trees on neighboring property using Tree Assessment Tool (TAT).
 - a. REMOVE trees, if recommended.

Figure 2. Tree Factor-Height



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- 3.5 ENSURE NO combustible materials are left within reduced fuel zone. For example:
- Logs
 - Wood poles OR woody debris
 - Pallets
 - Mattresses
 - Trash
- 3.6 ENSURE NO loose surface litter that exceeds a depth of three inches. For example:
- Fallen leaves
 - Needles
 - Twigs
 - Bark
 - Cones
 - Pods
 - Small branches, etc.
- 3.7 ENSURE annual grass does NOT exceed a maximum height of 4 inches.
- In situations where these fuels are isolated from other fuels OR present on steep slopes equal to or greater than 40%, grasses AND forbs may reach a height of 18 inches to maintain soil stability.
 - Grasses AND weeds in areas of substation parcel exposed to public thoroughfares AND areas that are required to be maintained by municipal, county or state weed abatement standards are also to be kept below a maximum height of 4 inches.
- 3.8 REMOVE all new AND regenerating tree growth.

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NOTE

The lack of vertical space can allow a fire to move from the ground to the brush to the treetops like a ladder.

- 3.9 ENSURE minimum vertical clearance between limbs.
 1. REMOVE all tree branches at least 6 feet from the ground.
 2. ALLOW extra vertical space between shrubs AND trees.
 3. SEE Figure 3. A Five Foot Shrub is Growing Near a Tree. $3 \times 5 = 15$ feet of clearance needed between the top the shrub and the lowest tree branch below to determine proper vertical spacing between shrubs AND lowest branches of trees.

Figure 3. A Five Foot Shrub is Growing Near a Tree. $3 \times 5 = 15$ feet of clearance needed between the top the shrub and the lowest tree branch

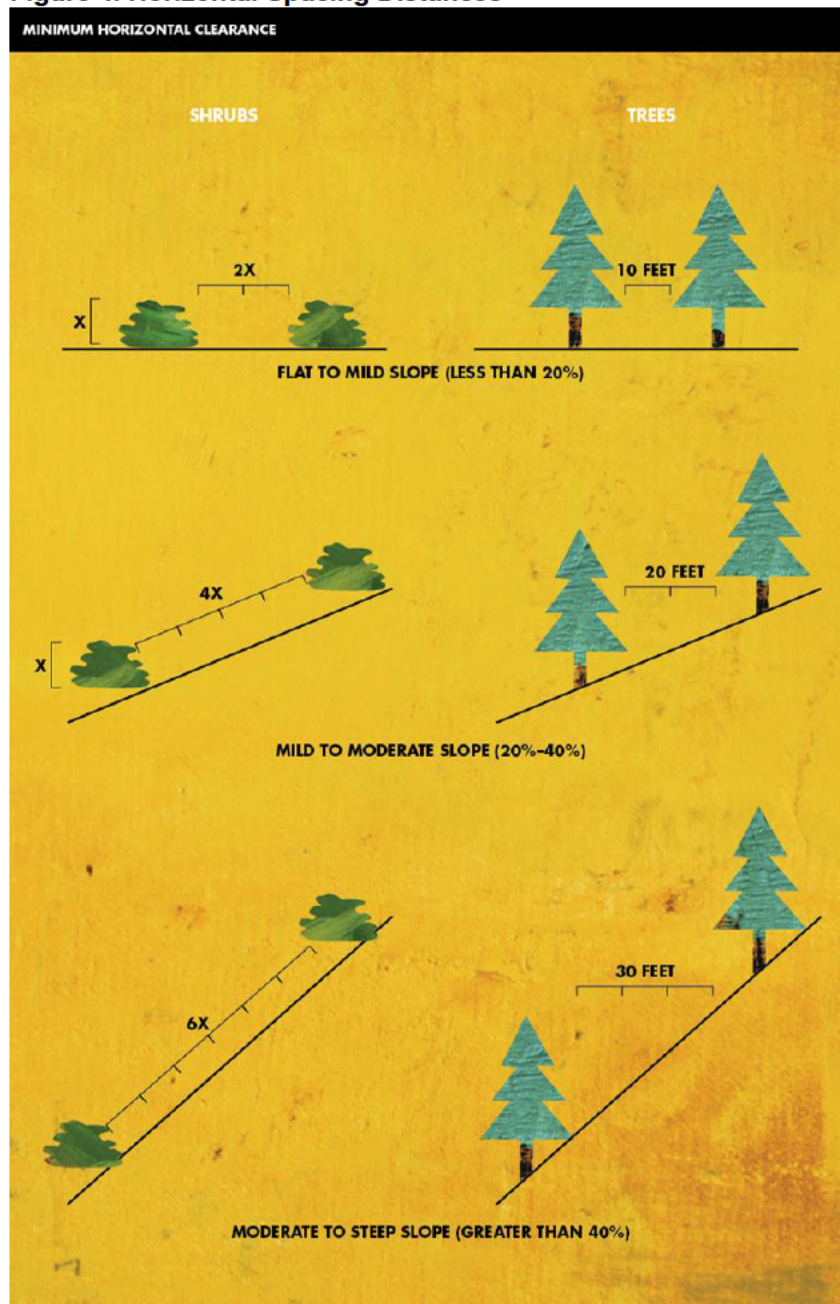


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3.10 ENSURE horizontal spacing of trees AND shrubs.

- Horizontal spacing depends on the slope of the land and the height of the shrubs or trees.
- SEE Figure 4. Horizontal Spacing Distances below to determine proper horizontal spacing distances between trees AND shrubs.

Figure 4. Horizontal Spacing Distances



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4 Construction Activity

4.1 CONSIDER facilities in place 180-days OR more permanent, for the purposes of defensible space.

1. ENSURE defensible space is adjusted to include new facilities.

4.2 WHEN a temporary facility is located in a substation,

THEN Local Area Maintenance Supervisor CREATE a corrective notification with a 180-day due date to ensure either:

- Temporary facilities are removed.
- Defensible space is adjusted to include new facilities.

4.3 IF new facilities are going to be located in facility for longer than 180-days,

THEN CONTACT Natural Resource Management Defensible Space (NRM-DS) to have defensible space boundary established or adjusted to need of specific facility.

4.4 PLACE temporary equipment AND combustible construction material in:

- Inner perimeter of clean zone.
- Safe distance from equipment AND overhead lines.

4.5 STORE combustible equipment in fire resistant containers, when possible. For example: shipping containers, dumpsters with metal lids, etc.

5 Documenting and Recording Inspection and Work Verification

5.1 IF establishing defensible space OR implementing substation fire hardening requirements to an adjacent property,

THEN ENSURE permission is obtained from adjacent landowners per Natural Resource Management Defensible Space (NRM-DS) program.

1. ENSURE adjacent landowners are offered vegetation management during each inspection cycle.
2. IF landowner declines to provide permission,

THEN ENSURE NRM-DS contacts fire agency having jurisdiction over property to determine if there is a local ordinance that requires landowner to comply.

- ENSURE landowners refusing permission are sent a certified letter stating that PG&E has offered vegetation management AND was declined.

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5.1 (continued)

3. IF in sensitive communities,

THEN ENSURE NRM-DS utilizes Local Customer Experience (LCE) department for outreach.

5.2 UNDERSTAND NOT all locations can reasonably meet defensible space AND substation fire hardening requirements.

1. ENSURE Defensible Space AND Fire Hardening status for individual facilities are classified in SAP as an attribute updated AND maintained by NRM-DS quarterly. These attributes are as follows:
 - a. Defensible Space Required? (Yes OR No)
 - b. Defensible Space Achieved? (Yes OR No)
 - c. If Defensible Space is not achieved, why? (Indicating one of the following)
 - Refusal – Private property owner declines vegetation management.
 - Permitting – Extended period to achieve proper permitting. For example: Coastal Commission, Local Government, Caltrans, Etc.
 - Environmental – Vegetation Management scope involves work prescribed in either biological or, culturally sensitive resources where remediation is not feasible. For example: water courses, estuaries, Native American sites, etc.
 - Structure – Any building that is within Defensible Space Zone 1 (Clean Zone) or Zone 2 (Reduced Fuel Zone).
 - Construction – Other facility work being performed that involves equipment and material that interferes with compliance to requirements listed herein.

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5.3 IF facilities where options of vegetation mitigation have been exhausted AND either of the following are also accurate:

- 100% defensible space is NOT met.
- Vegetation mitigation is not feasible.

THEN ENSURE NRM-DS notifies Substation Asset Strategy AND Substation Defensible Space Committee of such instances to seek other potential risk reduction alternatives. For example:

- Animal abatement
- Fire suppression systems
- Barriers

5.4 ISSUE an SAP PR Notification for each substation included in the program to authorize NRM in commencing inspection AND perform prescribed work at facilities listed in SAP.

1. ENSURE the following:

- a. SAP Notification includes facility name AND required end date.
- b. Notifications closed out prior to required end date.
- c. Closure of Notifications are accompanied by proper verification documentation that may include images, inspection forms, JSA's and complete work orders.

5.5 ISSUE an SAP LC Notification for NRM-DS corrective and routine annual work that is identified by NRM-DS annual inspection.

1. ENSURE the following:

- a. SAP Notification includes facility name AND required end date.
- b. Notifications closed out prior to required end date.
- c. Closure of Notifications are accompanied by proper verification documentation that may include images, inspection forms, JSA's and complete work orders.

5.6 ISSUE an SAP LC Notification for NRM-DS corrective work that is identified by Substation M&C or other Substation supplemental inspection not performed by NRM.

1. ENSURE the following:

- a. SAP Notification includes facility name AND required end date.
- b. Notifications closed out prior to required end date.

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- c. Closure of Notifications are accompanied by proper verification documentation that may include images, inspection forms, JSA's and complete work orders.

6 Landscaping

- 6.1 REFER TO Natural Resource Management Defensible Space (NRM-DS) for Substation Landscaping recommendations for Defensible Space compliance.

END of Instructions

DEFINITIONS

NA

IMPLEMENTATION RESPONSIBILITIES

The Natural Resource Management team within Land Operations is responsible for implementation and compliance with this standard, with ultimate responsibility held by the Supervisor of Land Operations.

GOVERNING DOCUMENT

- TD-3322B-65, "Wildfire Defensible Space for Substations"
- LAND-4001S, "System-wide Facilities Vegetation Control"

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

Records and Information Management:

Information or records generated by this procedure must be managed in accordance with the Enterprise Records and Information (ERIM) program Policy, Standards and Enterprise Records Retention Schedule (ERRS). REFER [GOV-7101S, "Enterprise Records and Information Management Standard"](#) and related standards. Management of records includes, but is not limited to:

- Integrity
- Storage
- Retention and Disposition
- Classification and Protection

REFERENCE DOCUMENTS

Developmental References:

Substation Fire Hardening

NA

Supplemental References:

NA

APPENDICES

NA

ATTACHMENTS

NA

DOCUMENT REVISION

TD-3322B-065

DOCUMENT APPROVER

██████████, Substation Asset Strategy

██████████ Substation M&C

DOCUMENT OWNER

██████████ – Supervisor, NRM

DOCUMENT CONTACT

██████████, Substation M&C Fire Marshal

██████████ – Land Consultant, NRM

██████████ – Supervisor, NRM

REVISION NOTES

Where?	What Changed?
NA	New procedure.