

## T-Line Aerial Inspection Process

### SUMMARY

This utility procedure defines processes and provides instructions for performing aerial inspections of PG&E's electric transmission overhead lines in accordance with [Electric Transmission Preventive Maintenance \(ETPM\) Manual](#) (TD-1001M).

Level of Use: Informational Use

### TARGET AUDIENCE

Personnel who manage, perform, or document aerial inspections including, but not limited to, the following:

- Aerial and specialized inspections
- Centralized Inspection Review Team (CIRT)
- Quality management
- Electric transmission asset strategy

### SAFETY

NA

### BEFORE YOU START

USE standard-issue personal protective equipment (PPE).

FOLLOW standard safe work practices. REFER to [Uncrewed Aircraft Systems \(UAS\) Operations Manual](#) (AVI-4001M) and/or [Helicopter Operations Field Manual](#) (AVI-3001M).

When required, ADHERE to safe work practices and procedures related to aerial lifts (i.e., bucket truck).

COMPLETE training requirements. REVIEW PG&E Academy training curriculum for available updated courses.

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## T-Line Aerial Inspection Process

### PROCEDURE STEPS

#### 1 General Requirements

- 1.1 PERFORM aerial inspections of PG&E electric transmission assets in accordance with PG&E's [Wildfire Mitigation Plan \(WMP\)](#) and the [ETPM Manual](#), as follows:

1. CAPTURE imagery.
2. PROCESS imagery.
3. REVIEW imagery.
4. DOCUMENT findings.

#### 2 Image Capture

- 2.1 USE an approved unmanned aerial system (UAS) or helicopter-mounted autonomous image capture (AIC).
1. WHEN physical constraints exist,  
THEN PROCEED with approved alternate capture method (i.e., handheld photography, bucket truck, etc.).
- 2.2 CAPTURE required shots AND VERIFY that imagery meets specifications.
1. IF needed, FOLLOW the “Can’t Get In” (CGI) process described in [Section 3](#) below.
- 2.3 UPLOAD imagery to the Amazon Web Services (AWS) cloud server.
1. IF the upload fails,  
THEN DELIVER images through an alternate shared drive platform.

#### 3 “Can’t Get In” (CGI) Process

- 3.1 REPORT access issues via AWS AND INCLUDE detailed notes.

#### NOTE

Resolution information is transmitted nightly via AWS report.

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3.2 SELECT one category from the list below.

1. Hostile Interaction

a. IF threatened,

THEN TAKE steps to ensure safety, as follows:

(1) IF the encounter is a viable threat (i.e., person making threat[s] is capable of carrying it out),

THEN CALL 9-1-1.

(2) Immediately END the encounter AND LEAVE the area.

- NOTIFY the supervisor AND REQUEST an escort.

(3) Once safe, NOTIFY the supervisor AND corporate security at [REDACTED]

b. NOTIFY local headquarters AND RESCHEDULE the visit.

2. Customer Coordination Required

a. SELECT this category if Maps+ AND CGI do not provide information needed to solve an access issue (e.g., missing/wrong gate code, notification required but missing/wrong contact information).

b. NOTE lead times in Maps+ OR those provided by CGI.

c. IF notification (or a gate code) **is** required,

THEN MAKE five attempts to contact the customer before reporting an access issue. This alone is not an access issue.

d. INPUT updated contact information **directly** into Maps+.

3. Customer Refusal Critical

a. SELECT this category if customer has refused access to a property.

4. Road Maintenance Required

a. SELECT this category if a PG&E access road requires maintenance (tree blocking road, bridge washed out, etc.).

5. Vegetation Surrounding Structure

a. SELECT this category if vegetation surrounding the structure prevents successful capture of the entire shot sheet.

## T-Line Aerial Inspection Process

### 3.2 (continued)

6. Birds – Unidentified Species
  - a. SELECT this category if team in the field identifies a bird OR nest on or near the structure.
  - b. FOLLOW guidance outlined in the Environmental Release Guidance (ERG) documents.
7. Birds – Biologist Confirmed No Fly
  - a. DO NOT SELECT this category.
  - b. A PG&E biologist ASSESSES the structure.
    - (1) IF the PG&E biologist determines that the structure cannot be flown, THEN this category will be used to communicate that information.
8. PG&E Environmental/Land Coordination Required
  - a. SELECT this category if an agency prevents access (e.g., United States Forest Service [USFS], Caltrans, Bureau of Land Management [BLM], National Park Service [NPS], prison).
9. Difficult Terrain
  - a. SELECT this category if terrain prevents safe access to structure.
  - b. IF a road ends OR turns into a foot access path, THEN WALK to the structure.
10. Substation
  - a. SELECT this category if flight cannot be completed from outside the substation fence without flying over substation assets.

#### NOTE

If the structure is outside the substation fence, a drone **can** cross over the fence to capture imagery if it does not fly over any substation assets.

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### 3.2 (continued)

#### 11. Restricted Airspace

- a. SELECT this category if Low Altitude Authorization and Notification Capability (LAANC) indicates a controlled airspace which prevents successful capture of the entire shot sheet (e.g., airports, military airspace).

## 4 Image Processing (Ingestion)

### 4.1 EXAMINE imagery, metadata, and data labels.

### 4.2 PERFORM Data Quality Assurance (DQA).

1. TRANSFER imagery from the vendor image repository to PG&E repositories.
2. PERFORM analysis on image data.
  - a. CONFIRM presence of capture metadata (latitude, longitude, altitude, timestamp, etc.) for all images.
  - b. CONFIRM that the structure identification matches the expected scope status.
  - c. Using the Global Positioning Satellite (GPS) coordinates, CALCULATE the centroid of structure images.
  - d. FLAG data when **any** of the following conditions are true:
    - (1) Delivery deviates from expectations, based on structure type.
    - (2) Imagery for two or more structures is delivered together.
    - (3) Centroid does not match the structure's Geographical Information System (GIS) location from SAP.

### 4.3 PERFORM Image Quality Assurance (IQA).

1. REVIEW the structure image set for overall quality.
  - a. LOOK for the following quality issues:
    - (1) Blurry images
    - (2) Images with poor brightness OR contrast
    - (3) Insufficient, incorrect, OR unorganized imagery

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### 4.3 (continued)

#### NOTE

When sufficient imagery exists to complete a quality inspection, the presence of non-inspectable images in a data set does not warrant rejection.

2. CHECK for “A” tags.
  - a. IF damage or configuration creates a potential safety risk,  
THEN ESCALATE the issue to the CIRT for review.
3. CHECK for mapping errors.
  - a. LOOK for the following items:
    - (1) Asset data updates (e.g., structure or framing type)
    - (2) Location updates (e.g., unmapped structures in field or structures mapped to the wrong location)
  - b. DOCUMENT AND SUBMIT a Request for Work (RW) for map correction.
    - (1) ENSURE that RWs include notes describing errors and expected change.
  - c. When necessary, COMMUNICATE with the mapping team.
    - (1) ADDRESS follow-up questions.
    - (2) PROVIDE additional support.

### 4.4 Good Quality Structures

1. MARK “good,” THEN SEND to inspections personnel for a full review, in accordance with [Section 5, “Image Review,”](#) on Page 7.

### 4.5 Rejected Structures

1. FOLLOW appropriate resolution flow(s):
  - a. WHEN data requires re-flight, correction, OR re-submission,  
THEN SEND the structure back to the vendor.

#### NOTE

The vendor must resolve vendor errors, while internal errors must be resolved internally.

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### 4.5 (continued)

- b. WHEN insufficient helicopter imagery exists,  
THEN SUPPLEMENT with alternative imagery source.
  - (1) OBTAIN alternative imagery of the structure.
  - (2) MERGE all images.
  - (3) SEND to IQA for review as a single set of imagery that covers the entire structure.

## 5 Image Review

### 5.1 AIR+ inspectors PERFORM the following actions:

- 1. REVIEW pictures of field scenarios AND RECOGNIZE regulatory and compelling conditions that need to be addressed within the Compliance Program timeframe.

#### NOTE

Compliance inspectors receive special training targeted to maintenance and inspection processes with an emphasis on assessing and identifying conditions that would negatively impact safety and reliability.

- 2. IF imagery allows a complete and quality inspection,  
THEN TAKE the following steps:
  - a. Correctly IDENTIFY AND PRIORITIZE nonconformances using PG&E guidance documents (PG&E standards or procedures, *AIR+ Handbook*, [ETPM Manual](#), etc.) and training.
  - b. DOCUMENT structure inspection AND ASSESS conditions using Sherlock tool.
  - c. NOTATE non-conformances in accordance with the [ETPM Manual](#).
  - d. STORE inspection records in SAP.
- 3. OTHERWISE, IF imagery **does not** allow a complete and quality inspection,  
THEN TAKE the following steps:
  - a. IDENTIFY photographs requiring recapture.
  - b. NOTE abnormal, deficient, or potentially hazardous conditions as a non-conformance.
  - c. DOCUMENT non-conformances in accordance with the [ETPM Manual](#).

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5.2 An AIR+ inspection review specialist (IRS) PERFORMS the following actions:

1. Using PG&E guidance documents (PG&E standards or procedures, *AIR+ Handbook*, [ETPM Manual](#), etc.) and training, PERFORM a cursory review of the structure and inspector's findings for accuracy AND CONFIRM that there are no missed nonconformances.
  - a. If needed, DOCUMENT any additional nonconformances found.
  - b. Then CORRECT errors, as applicable, AND COACH the inspector on changes.

### END of Instructions

### DEFINITIONS

**Centralized Inspection Review Team (CIRT):** A cross-discipline team made up of personnel with a transmission and distribution system maintenance and engineering background and knowledge (experience) that perform screen notifications for Facility Damage and Corrective Action Codes (FDA) and Prioritization, in accordance with [Utility Procedure TD-1001P-10, "Centralized Inspection Review Team \(CIRT\) Procedure."](#)

**Notification:** Work-only notification assigned for all problems for which corrective actions are necessary.

### IMPLEMENTATION RESPONSIBILITIES

Supervisor will communicate this procedure to employees during annual training.

### GOVERNING DOCUMENT

[Utility Standard TD-1001S, "Electric Transmission Line Inspection and Preventive Maintenance Program"](#)

### COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

#### Records AND Information Management:

Information or records generated by this procedure must be managed in accordance with Enterprise Records and Information Management (ERIM) program policy, standards, and Enterprise Records Retention Schedule (ERRS). Refer to [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



## T-Line Aerial Inspection Process

### REFERENCE DOCUMENTS

#### Developmental References:

NA

#### Supplemental References:

Utility Manuals:

- [Electric Transmission Preventive Maintenance \(ETPM\) Manual](#) (TD-1001M)
- [Helicopter Operations Field Manual](#) (AVI-3001M)
- [Uncrewed Aircraft Systems \(UAS\) Operations Manual](#) (AVI-4001M)

[PG&E's Wildfire Mitigation Plan \(WMP\)](#)

[Utility Procedure TD-1001P-10, "Centralized Inspection Review Team \(CIRT\) Procedure"](#)

### APPENDICES

NA

### ATTACHMENTS

[Attachment 4, "Transmission Supplemental Inspection Role Qualifications"](#)

### DOCUMENT RECISION

This utility procedure cancels and supersedes the following documents:

- Utility Procedure TD-1001P-11, "Drone Inspection Review Team (DIRT)," Rev. 0, dated 08/06/2019.
- Attachment 1, "WSIP Drone Inspection Process," Rev. 0, dated 08/06/2019.
- Attachment 2, "WSIP Transmission DIRT Process," Rev. 0, dated 08/06/2019.
- Attachment 3, "Structure Inspection Drone Data Capture Guideline," Rev. 1, dated 08/06/2019.

### DOCUMENT APPROVER

, Manager, Transmission Standards and Work Methods

## T-Line Aerial Inspection Process

### DOCUMENT OWNER

██████████, Manager, Aerial and Specialized Technology

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### REVISION NOTES

Where?	What Changed?
Entire document	Comprehensive content update, including a new title.
Attachments	Cancelled and obsoleted the following attachments: <ul style="list-style-type: none"><li>• Attachment 1, "WSIP Drone Inspection Process"</li><li>• Attachment 2, "WSIP Transmission DIRT Process"</li><li>• Attachment 3, "Structure Inspection Drone Data Capture Guideline"</li></ul> Added new Attachment 4, "Transmission Supplemental Inspection Role Qualifications."