

**PPE:**

**Standard T-Line PPE,  
including:**

- Hard hat
- Safety glasses
- Gloves
- FR clothing

**Tools:**

- Binoculars
- Camera

**Guidance Document References:**

[TD-1001M, "Electric Transmission  
Preventive Maintenance Manual"](#)

**Level of Use:**

- ☐ Information
- ☒ Reference
- ☐ Continuous

## Purpose:

This job aid provides the steps for consistent evaluation of overhead ground wire/fiber optic (OPGW) cable in transmission lines, and consistent decision-making.

The Qualified Company Representative (QCR) should use this guide to evaluate the condition of OPGW cable, confirm proper application, select the appropriate condition representing the deterioration level, and consistently assign the priority code.

## Condition Codes:

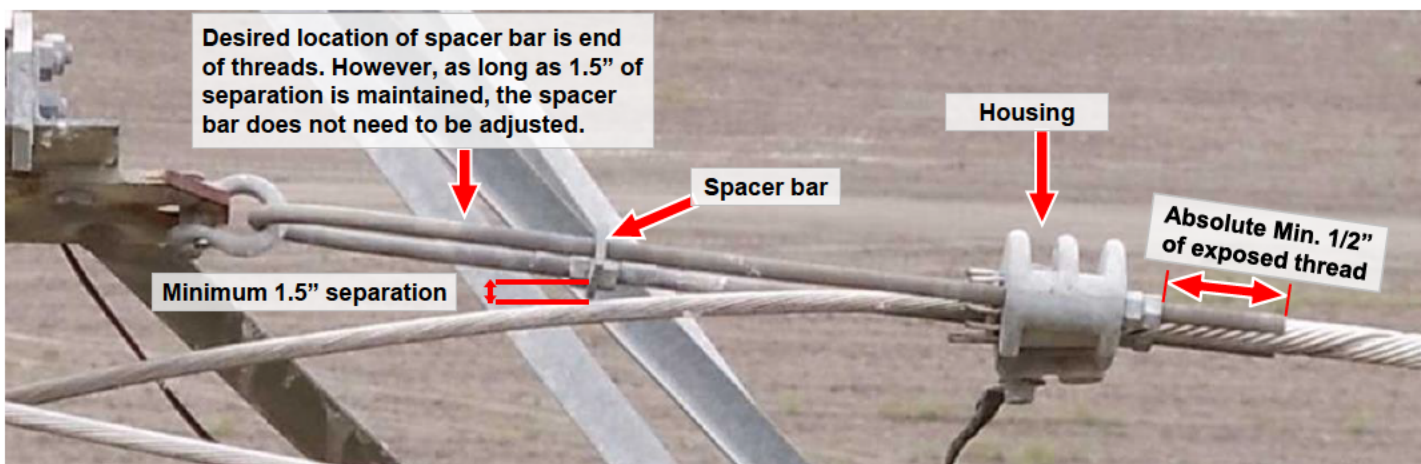
Inspect the structure using the form to record issues. Determine the condition of each item. Consider all conditions to determine the appropriate Priority Code for any notification, if required.

- 5 = Heavy damage with safety concerns
- 4 = Heavy damage
- 3 = Moderate damage
- 2 = Light damage
- 1 = No visible damage

If the damage on the OPGW cable creates an imminent threat, the QCR must immediately notify the supervisor and the IT Emergency Network Operating Center (ENOC) at (24×7).

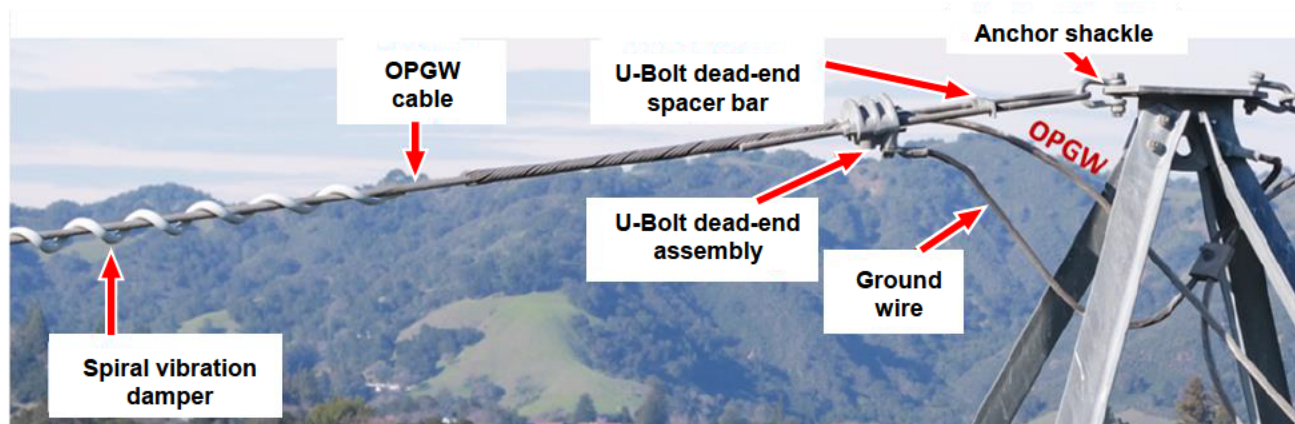
## OPGW Cable Inspections

- The incorrect placement of U-Bolt Dead-End assembly spacer bar and housing can cause damage to the OPGW cable.
  - The spacer bar and the OPGW cable should never be in direct contact.
  - Radial clearance between OPGW cable and spacer bar should be at least 1-½" (see red arrow below).
  - The ideal location of the spacer bar is at the end of the threads on the "U" end of the dead-end, while the housing should be installed towards the opposite end of the rods, with a minimum ½" exposed thread showing. This prevents the spacer bar from coming into contact with and damaging the OPGW. This also allows for the appropriate bend radius for the OPGW cable. The minimum bend radius varies with each different diameter sized cable and the type/model of OPGW cable – ensure that sharp kinks or bends are not present.
  - Ensure that double nuts are tight at the end of housing.
- Vibration dampers: The damper must only be installed on the OPGW cable and not have any portion of the damper touching or installed on top of the preform rod set.
- Improperly placed down-lead clamps: Maximum distance between each clamp is 5 feet.
- Fiber splice cases and slack coils should not be affixed to structures with rope.
- Fiber cables are sometimes routed into a substation aerially, terminating on substation structures or stand-alone tubular steel poles or wood poles.





## OPGW Cable Inspections, continued



- Grounding of OPGW cables

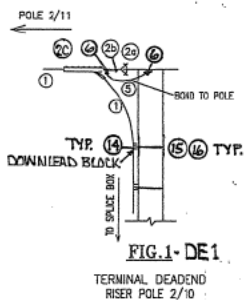
1. **500 kV:** OPGW is segmented (not grounded at every structure). See [Page 30](#) for further details.
2. **230 kV and below:** Each suspension and dead-end hardware has its own individual ground wire attached from the hardware back to the structure.

### Exceptions:

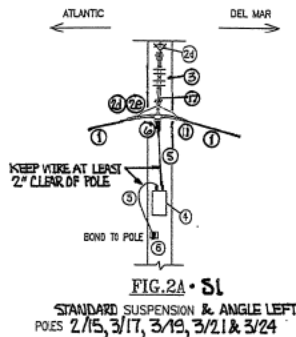
- a. Del Mar-Atlantic #1-60385 60-kV Ckt.
    - The grounding scheme is unique to this route only, utilizing an Isolator Surge Protector (ISP) to prevent interference with the adjacent railroad crossing arms.
    - [Drawing 233263](#) (see [Page 4](#)) specifies when the OPGW hanging hardware is grounded or isolated.
  - b. 230-kV installations that are segmented
    - There may be some instances where the OPGW hardware is isolated.
    - IF an OPGW cable is found to be installed on an isolator, THEN confirm the engineering design for grounding.
- Refer to [Standard Drawing 069367, "Fiber Optic OPGW Hardware on Overhead Transmission Line."](#)

## Del Mar-Atlantic #1-60385 60-kV Ckt., Grounding Scheme

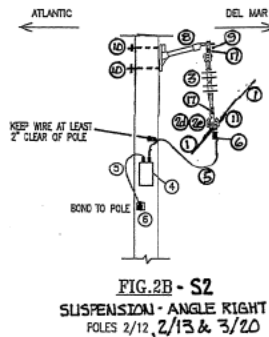
Refer to [Numbered Document 233263](#).



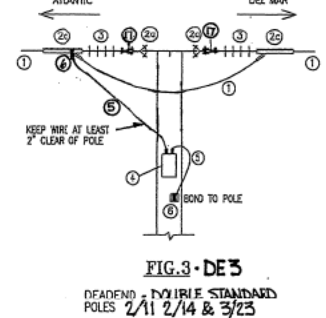
TERMINAL DEADEND  
RISER POLE 2/10



**FIG.2A • S1**  
STANDARD SUSPENSION & ANGLE LEFT  
POES 2/15, 3/17, 3/19, 3/21 & 3/24



**FIG.2B - S2**  
SUSPENSION - ANGLE RIGHT  
POLES 2/12, 2/13 & 3/20



DEADEND - DOUBLE STANDARD  
POLES 2/11 2/14 & 3/23

AS-BUILT FIGURES & DATA WERE PROVIDED BY PG&E  
GC LINE FIELD ENGINEER [REDACTED] WHO  
INSTALLED THIS LINE IN 2006.

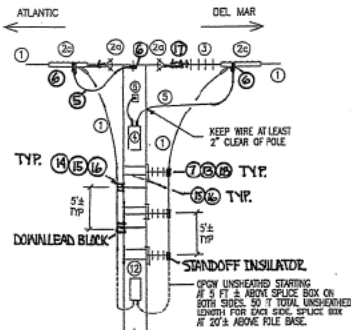


FIG.4- DE4

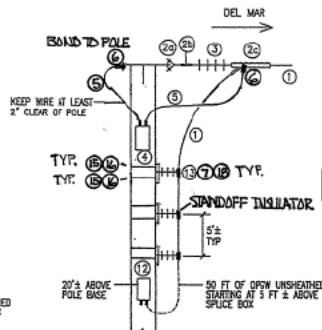


FIG.5-DE2

REFERENCES:

STRUCTURE DATA SHEETS, DEL MAR-ATLANTIC 60 KV -----	232758, 232760
TSP REQUIREMENTS, DEL MAR-ATLANTIC 60 KV -----	068450
TSP REQUIREMENTS, RISER POLE 2/10 -----	070301
SPECIFICATIONS & HARDWARE, 0.614" CPWN -----	8023733
INITIAL STRINGING DATA, 0.614" CPWN -----	089191
VIBRATION DAMPER INSTALL ATTON OPGWAC-51/51/114 --- ACA V	

6024299

MATERIAL LIST				
ITEM	DESCRIPTION	CATALOG NO.	PG&E CODE	REMARKS
1	0.514" OPW, AC-51/51/614 (SPEC J0N0-5588)			BY AFL TELECOMMUNICATIONS LLC
2a	Y-CLEVIS CLEVIS 90, GALV STEEL, BENT PN DIA 3/4"	YCC-90		ITEM 2 ON HWG 6023733 SHL
2b	LINK PLATE, ALUM, TONGUE-TONGUE FITTINGS	ODEFL10		ITEM 1 ON HWG 6023733 SHL
2c	BOLTED DEADEND, ALUM, BY ALCOA	ODE YYY YY XXXX G		ITEM 3 ON HWG 6023733 SHL
2d	Y-CLEVIS EYE 90, GALV STEEL, BENT PN DIA 3/4"	YCE-90-SC		ITEM 1 ON HWG 6023733 SHL
2e	SUSP CLAMP ASSEMBLY, ALUM OSPSP4	SUMED00/XXX		ITEM 2 ON HWG 6023733 SHL
3	INSULATOR, COMPOSITE, DE CLEVIS-EYE FITTINGS	MACLEANDS-15M	31-0054	DWG 0222CR
4	ISOLATOR SURGE PROTECTOR (ISP)	ISP57145240NS		BY DARRYLDA ELECTRICAL INDUSTRIES (DE)
5	GROUND WIRE, 4/0 ACSR (5/1 STR), PENGUIN/GA		29-0083	
6	3" TERMINAL CONNL FOR BONDING TO POLE		30-3759	DWG 015751
7	INSULATOR POST- CLAMP TOP TYPE	LAPP 4225UL70	31-1011	DWG 0120288
8	STANDOFF FIBERGLASS BRACKET 18"	JOSLYN T58-218NT	18-0206	DWG 015190
9	EYE NUT -TYPE 1 5/8" TAPPED HOLE	JOSLYN J1092	19-5308	DWG 058178
10	THROUGH BOLT, 5/8" DIA, LENGTH AS REQUIRED			DWG 058778
	WASHER, ROUND, 1 3/4" OD FOR 5/8" BOLT SIZE		19-5274	DWG 058778
	WASHER SPRING CLIP		03-3320	DWG 058778
11	ARMOR ROD FOR 0.514" OPW (TYPE OSPSP4)			DWG 6023733
12	SPICE BOX W/ COIL RACK FOR 0.514" OPW	0603 FOR SPICE BOX		BY AFL
	OIL RACK CULMISON FC-750-CR-1M	CB-44 FOR COIL RACK		
13	STANDOFF MOUNTING BRACKET (BANDIED)	M-F D-4080		ALUM-FORM
14	DOWN LEAD CLAMP, OPW (DOUBLE LEAD)	DDC 11/7004		AFL 068366
15	3/4" BANDS	EAB-5884	57-5550	AFL 068366
16	24" TURN BUCKLES FOR 3/4" BANDING	EAB-38	57-5348	AFL 068366
17	ANCHOR SHACKLE W/5/8" CLEVIS PIN	DB15721-200	18-2025	
18	CONDUCTOR CLAMP TENSION TYPE	DB 210611	18-2149	DWG. 0435501

AS-BUILT 11-02-2006 LKK

[illegible]

SCAN	2	IC	
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## OPGW Suspension Types with Different Grounding Methods



**Dulmison** (ground lug on the back side of suspension)



**AFL Suspension**  
(ground lug located at the bottom of suspension)



**PLP Suspension** (this does not have a grounding lug position; it utilizes what is called a "current transfer tab")

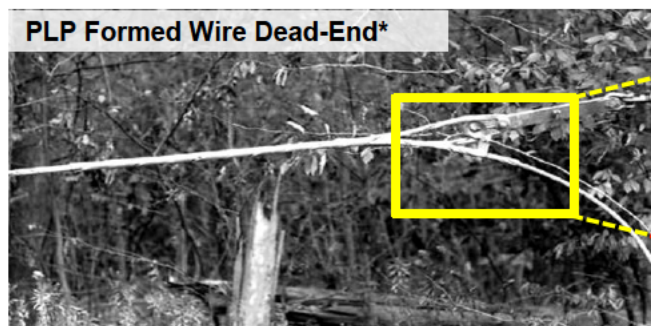
## OPGW Dead-End Types



**AFL Type Dead-End**



**U-Bolt Type Dead-End**



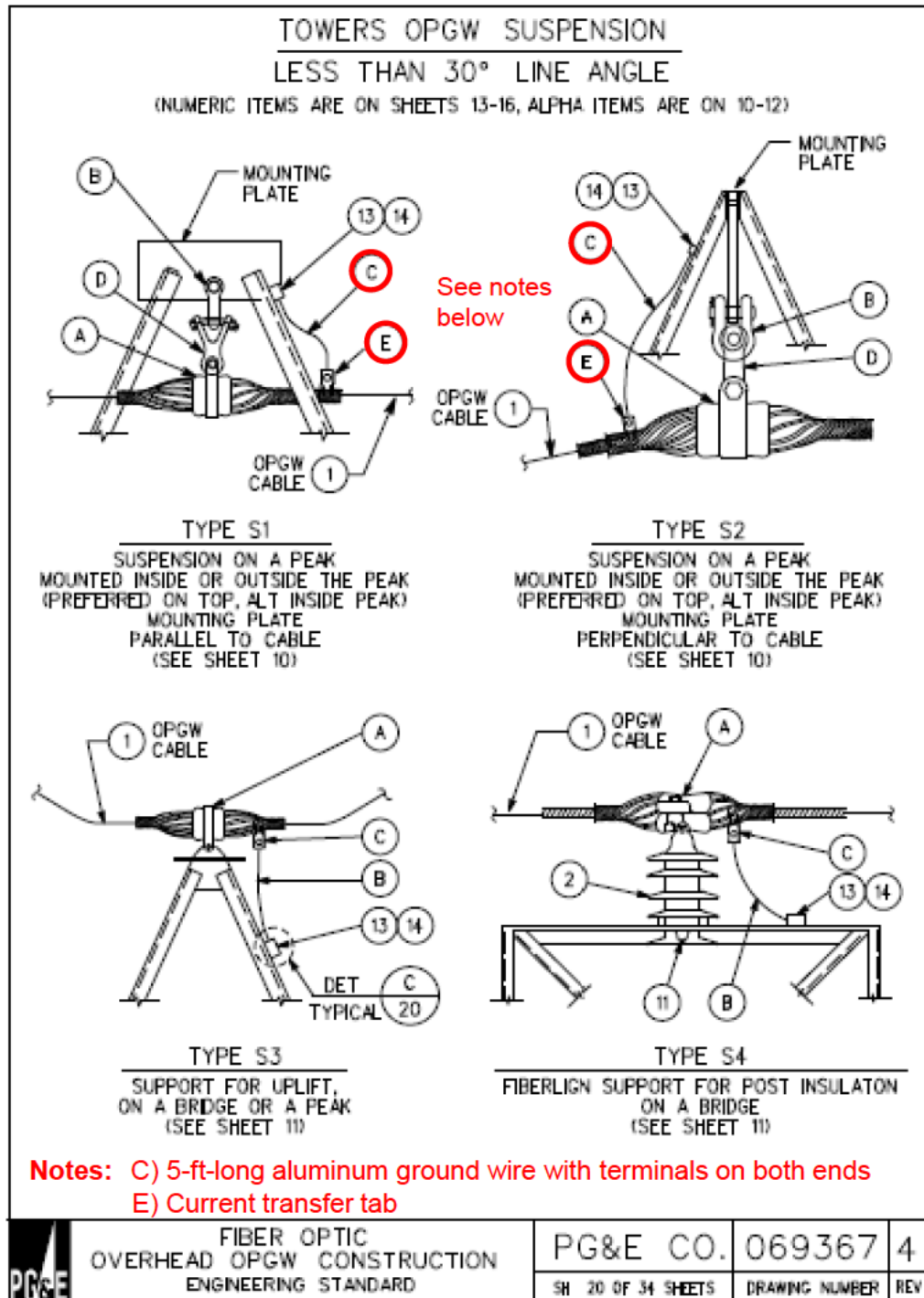
**PLP Formed Wire Dead-End\***



**Current Transfer Tab**

\*There are not too many of these installed in the system.

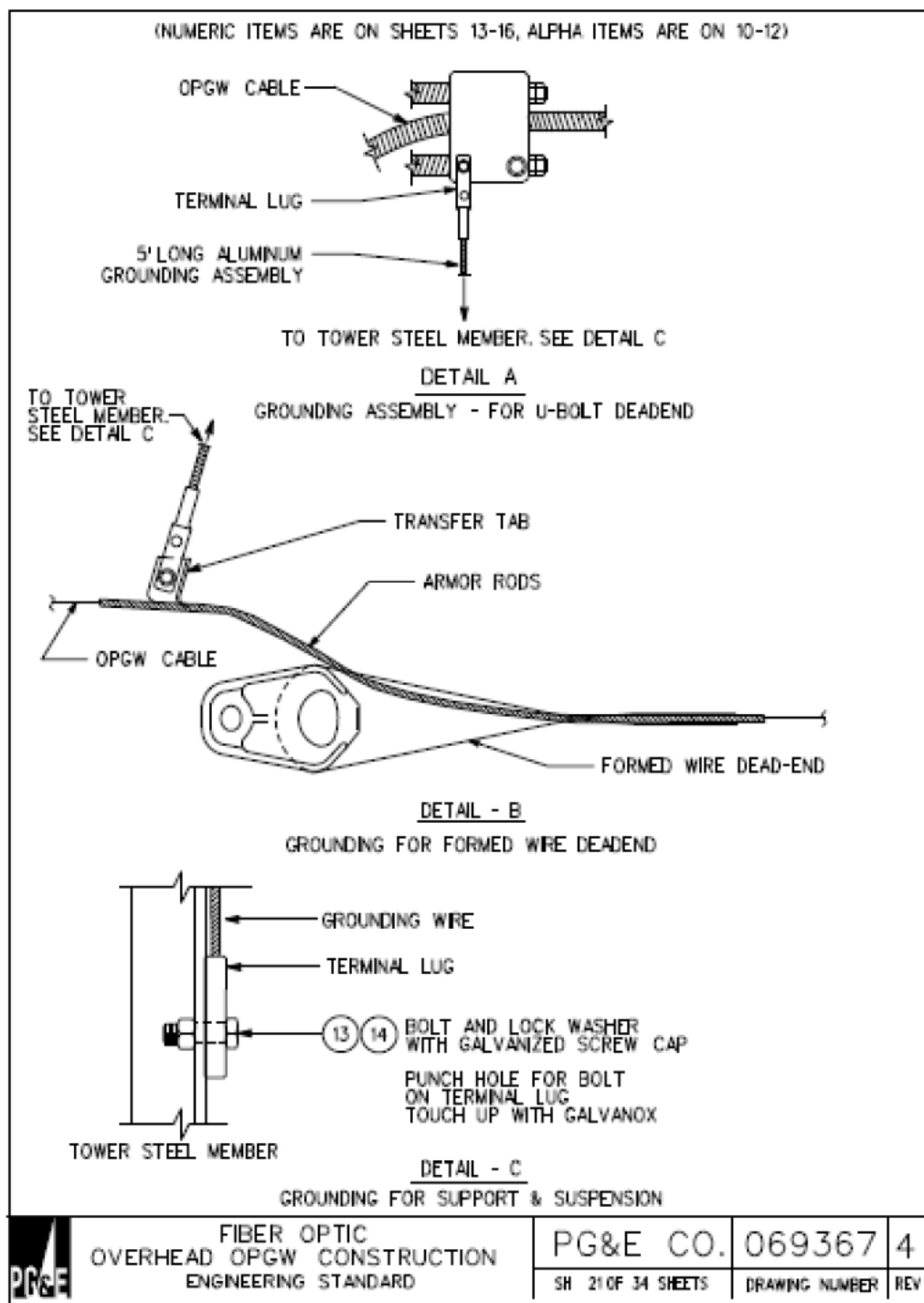
## Towers OPGW Suspension



Note: See [Page 3](#) for specifics on OPGW grounding.

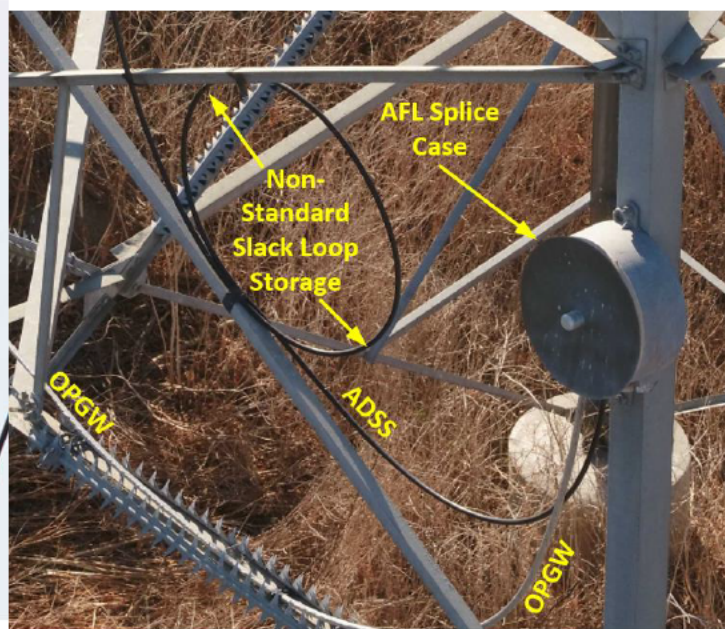
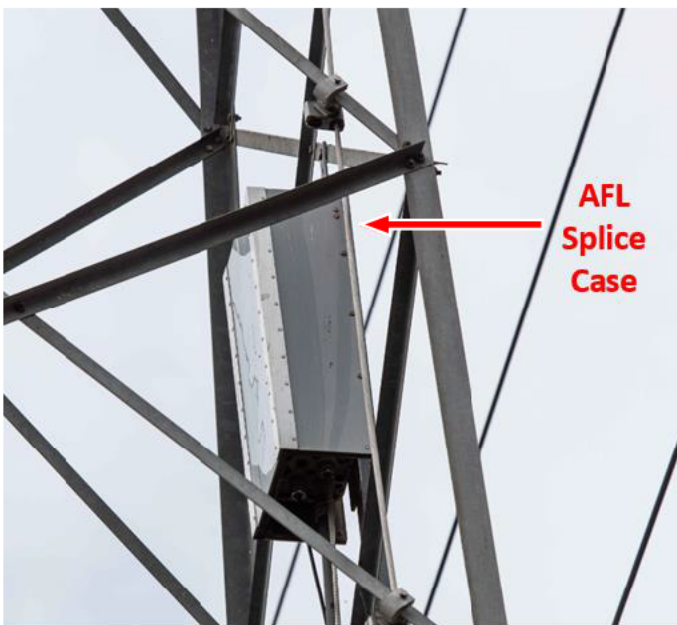
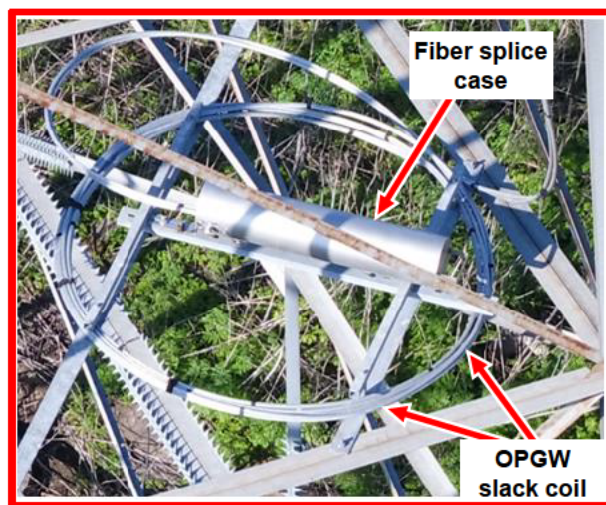
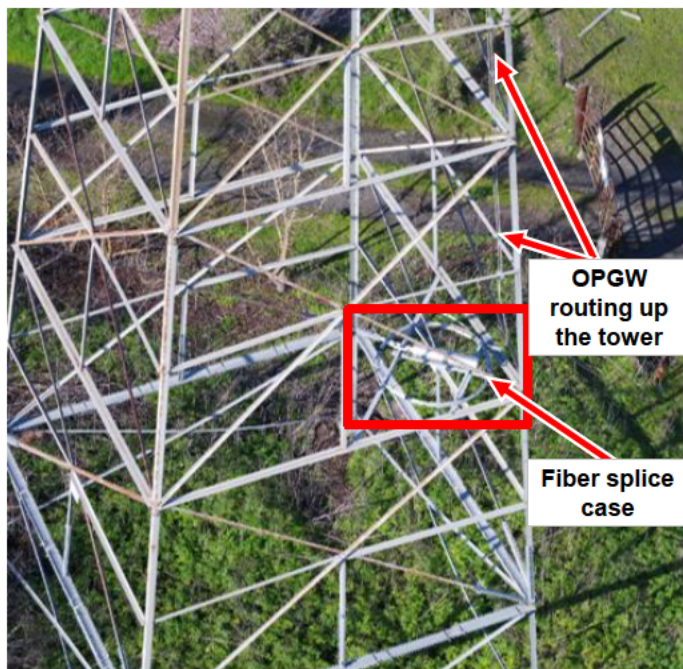


## Towers OPGW Dead-Ends



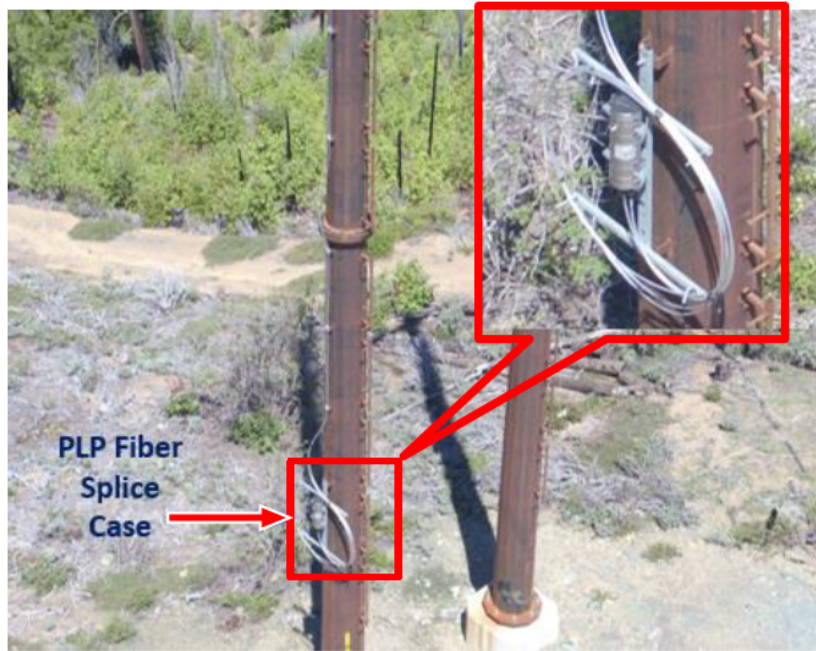
Note: See [Page 3](#) for specifics on OPGW grounding.

## OPGW Lattice Tower Splice Case Mount





## OPGW Tubular Steel Pole Splice Case Mount



## OPGW Wood Pole Splice Case Mount



## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

### Condition 5

**More than 50% material loss**, due to non-standard ground wire installation, with an **immediate** safety concern OR potential to impact operations.

#### Action:

1. Initiate SAP Notification; Priority Code A.
2. T-Line to make the situation safe by replacing hardware or by installing safety snubs or some alternative method.
  - IF the situation cannot be made safe and cable removal is the only option, THEN contact IT immediately, so that IT can notify the appropriate lines of business and 3rd party customers of the emergency outage.
3. Notify IT by calling the ENOC at [REDACTED].
  - Document the date, time, and the name of the person at the ENOC who took the call.
  - Capture this information in the Comments field of the SAP Notification.
3. Take close-up photos of the condition found.





## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

### Condition 5

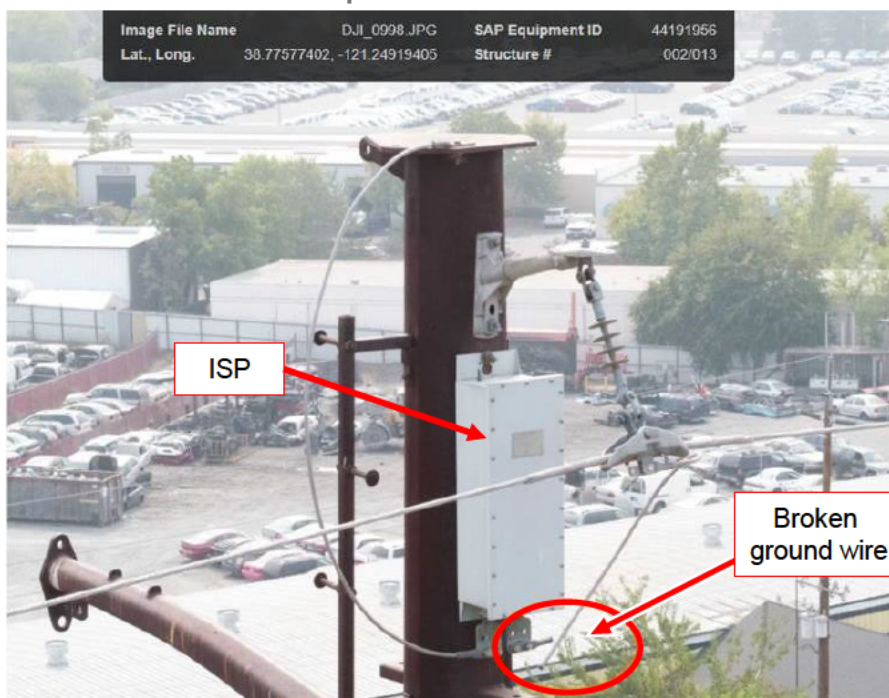
#### Broken ground wire to Isolator Surge Protector (ISP) with an immediate public safety concern.

The purpose of this scheme, is to prevent interference with the adjacent Union Pacific Railroad crossing arms. During a fault condition, the crossing arms could malfunction, if **either**:

1. The ground wire from the OPGW hardware to the ISP is broken, OR
2. The ground wire from the ISP to the structure is broken.

#### Action:

1. Initiate SAP Notification; Priority Code A.
2. Notify IT by calling the ENOC at [REDACTED].
  - Document the date, time, and the name of the person at the ENOC who took the call.
  - Capture this information in the Comments field of the SAP Notification.
3. Take close-up photos of the condition found.



## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

Condition 5

### Broken Strands (in the span/tension side)

#### NOTE 1

Repair rods can be used to repair broken strands under the following conditions:

1. The loose strands can be wrapped back into place.

AND

2. The damaged strands are within 8 inches of each other.

#### NOTE 2

Repair rods can restore the OPGW cable back to full rated breaking strength, if **three or fewer** strands are broken. If more than three strands are broken, repair rods provide **some** structural integrity back to the OPGW cable. For both scenarios, install repair rods.

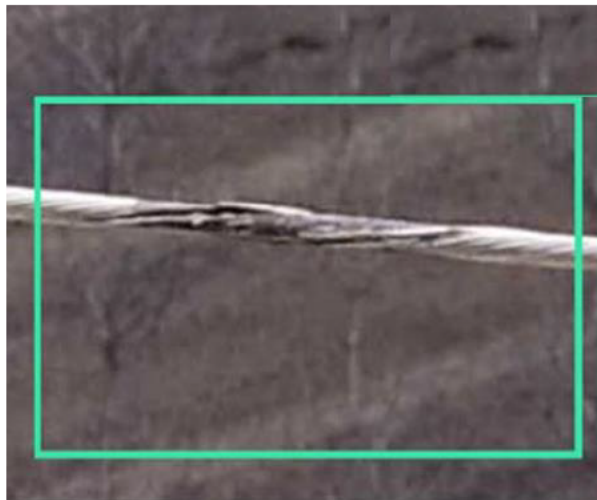
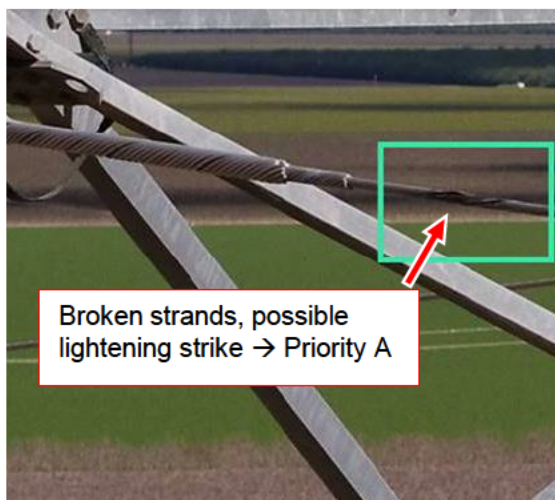
#### NOTE 3

IF more than three OPGW strands are broken,

THEN install U-bolt or preform dead-ends out past damaged area, as a safety snub to make safe.

### Action:

1. Initiate SAP Notification; Priority Code A.
2. T-Line crew to identify and document how many OPGW strands are broken. Report back to IT.
3. Take close-up photos of the damaged area.



## OPGW Condition Levels and Impact

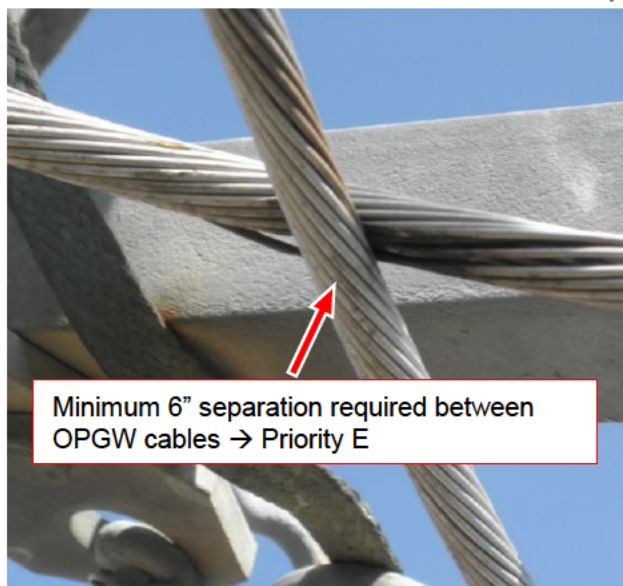
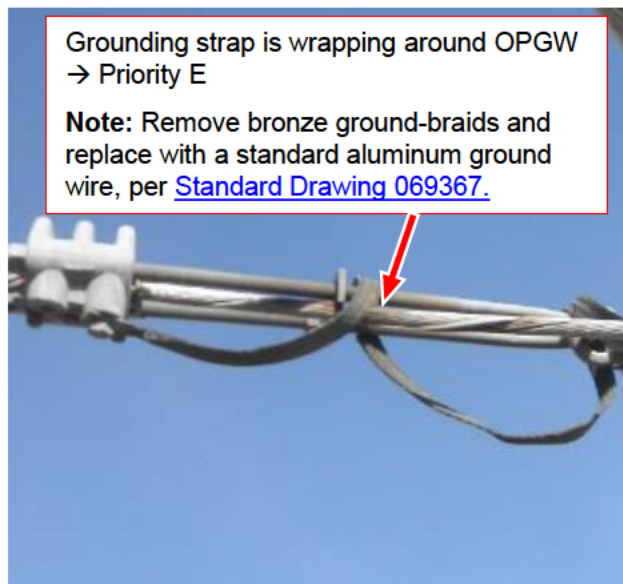
See Pages 30–37 for specific information on 500-kV conditions

Condition 4

**External contact on the OPGW.**

**Action:**

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 3 months.
3. Take close-up photos of the condition found.





## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

Condition 4

**Broken OPGW strands, not an emergency condition.**

### NOTE 1 (Non-Tension Side):

Since the damage is between the dead-end and the structure, there is no threat of the OPGW cable falling to the ground, if it were to fail. Install repair rods.

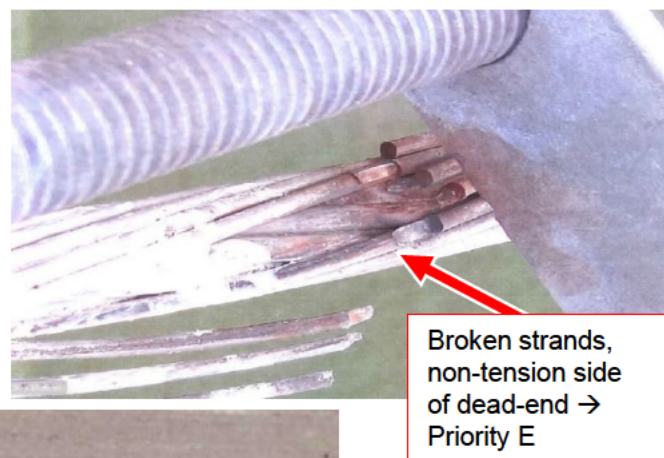
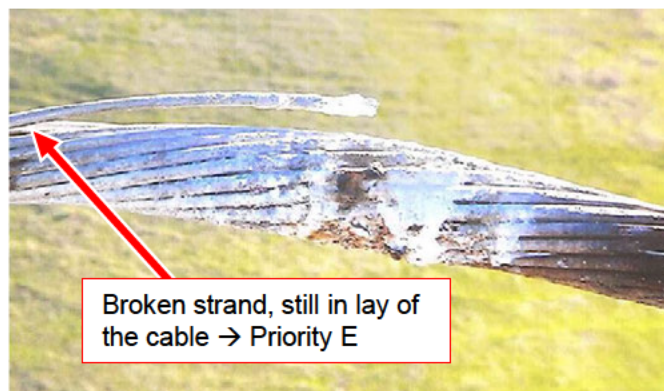
- The crew onsite needs to look very closely at the affected area to determine if the fiber strands have been damaged. The fiber is contained in a stainless-steel tube, a central steel tube, or in a plastic tube (for a slotted core design).

### NOTE 2 (Tension Side):

If three or fewer strands are broken out on the span, but they have not unraveled out of their lay position on the cable, then this is not an immediate threat to drop into the conductors below. Install repair rods.

### Action:

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 3 months.
3. T-Line crew to document how many OPGW strands are broken and if the steel tube containing the fiber strands has been damaged. Report back to IT.
4. Take close-up photos of the condition found.





## OPGW Condition Levels and Impact

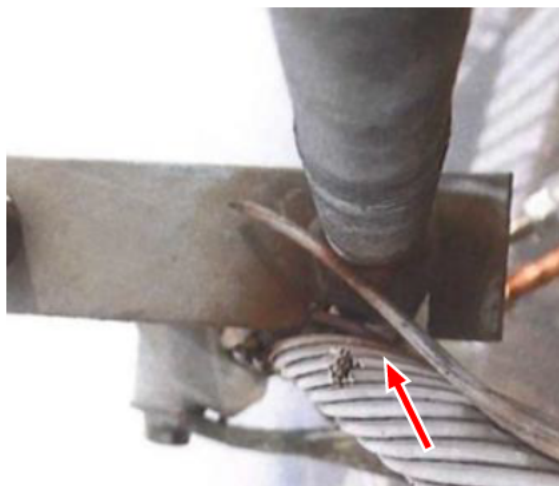
See Pages 30–37 for specific information on 500-kV conditions

Condition 4

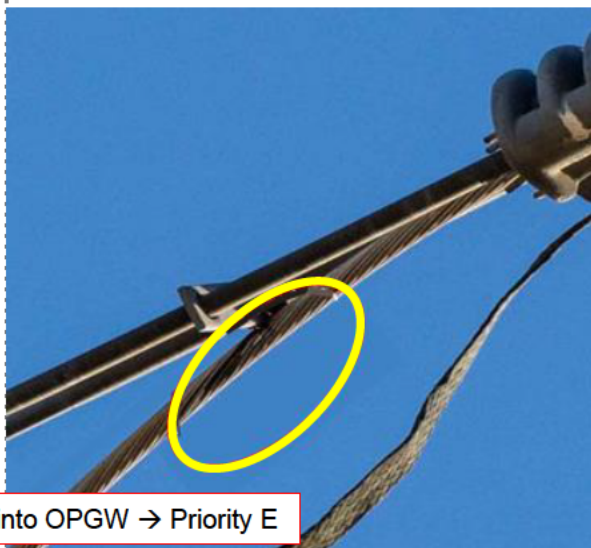
**Spacer bar is out-of-position/loose/cutting into OPGW.**

**Action:**

1. Initiate SAP Notification; choose Priority Code E.
2. Fix not to exceed 3 months.
3. Take close-up photos of the condition found.



Spacer bar is cutting into OPGW → Priority E



Spacer bar is out-of-position, contacting OPGW → Priority E



Loose spacer bar → Priority E



## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

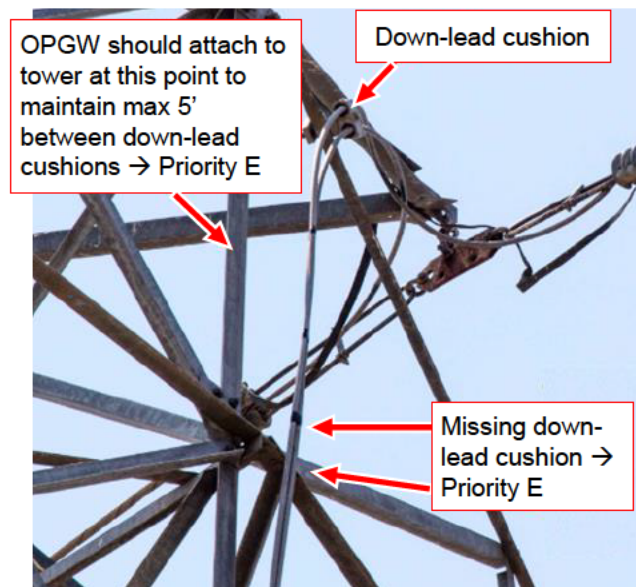
### Condition 4

#### Missing down-lead cushion.

OPGW is improperly secured to a structure.

#### Action:

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 3 months.
3. Take close-up photos of the condition found.





## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

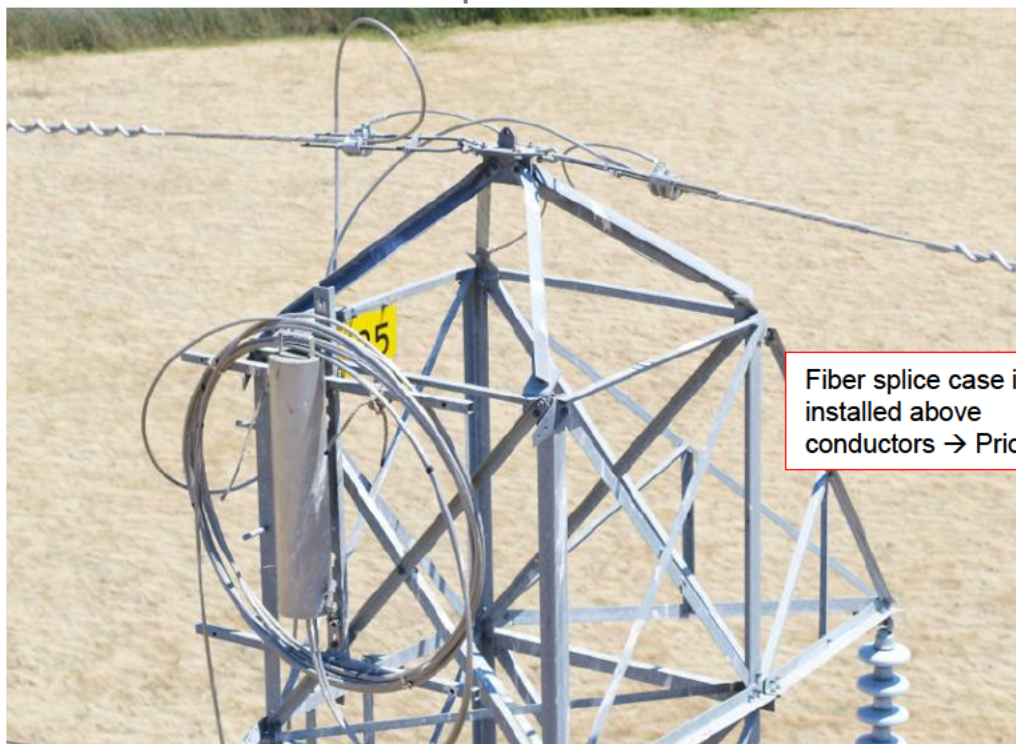
### Condition 4

Splice case is installed **above** electric conductors.

Slack storage frame is **improperly** secured to a structure.

#### Action:

1. Initiate SAP Notification; Priority Code E
2. Fix not to exceed 3 months.
3. Take close-up photos of the condition found.



## OPGW Condition Levels and Impact

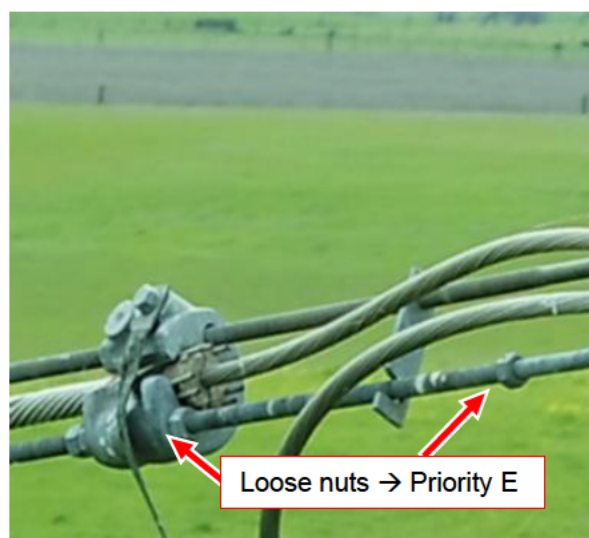
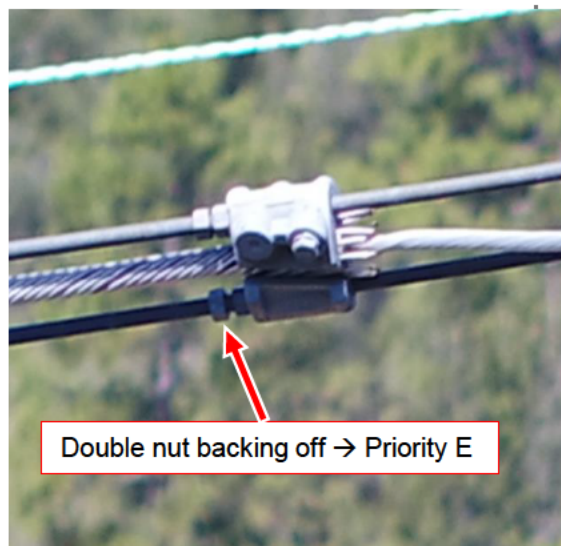
See Pages 30–37 for specific information on 500-kV conditions

### Condition 4

- Double nut backing off, loose nuts.
- Missing/out-of-position spacer bar.
- Bent U-bolt.

#### Action:

1. Initiate SAP Notification; choose Priority Code E.
2. Fix not to exceed 12 months.
3. Take close-up photos of the condition found.





## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

Condition 4

### Non-standard grounding installation.

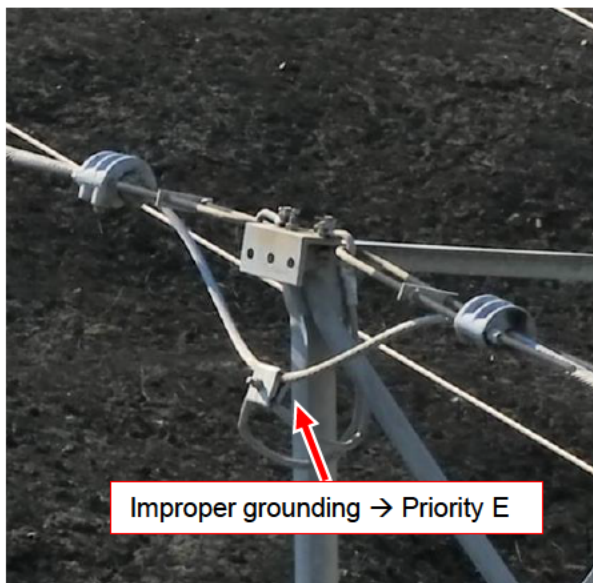
#### Action:

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 12 months.
3. Take close-up photos of the condition found.

Missing grounding → Priority E



Improper grounding → Priority E



Detached grounding  
→ Priority E



Improper grounding → Priority E



## OPGW Condition Levels and Impact

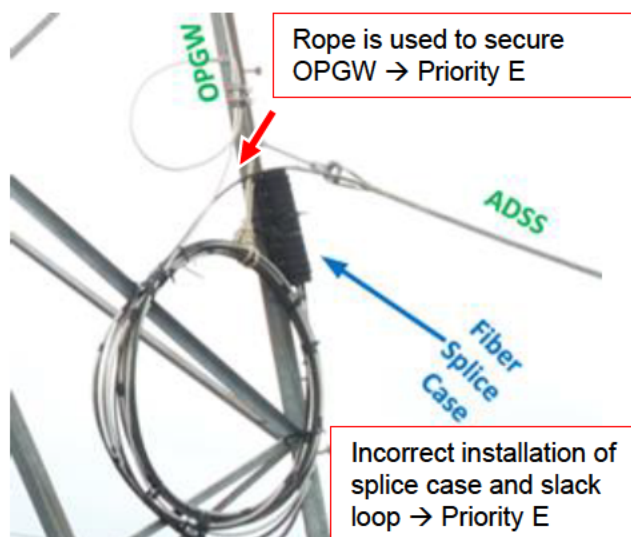
See Pages 30–37 for specific information on 500-kV conditions

Condition 4

### OPGW coil is installed incorrectly.

#### Action:

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 12 months.
3. Take close-up photos of the condition found.



## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

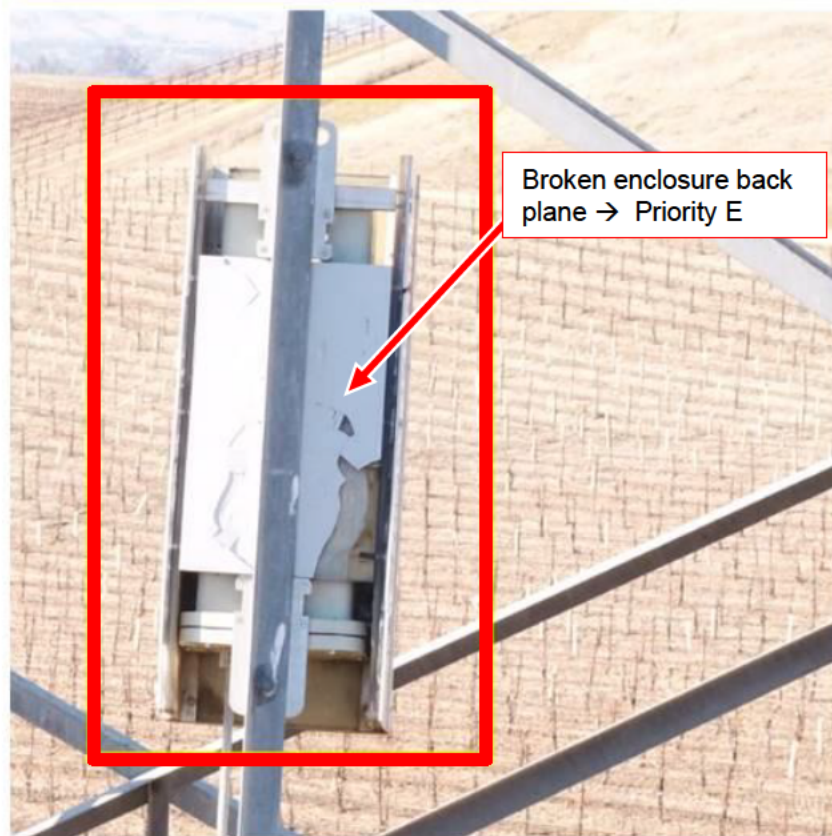
Condition 4

**Broken/cracked OPGW splice case**  
bullet-proof enclosure.

### Action:

1. Initiate SAP Notification; choose Priority E.
2. Fix no later than 12 months.
3. Take close-up photos of the condition found.

## TRANSMISSION NOTIFICATION





## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

Condition 4

### Pre-Existing Rope Safety Snubs

#### NOTE 1:

Safety snubs are typically installed out past a damaged area on the OPGW cable, to provide a safety dead-end grip, in case the cable were to fail. The safety snub should be a mechanical snub and not rope.

IF rope is found in this scenario,

THEN replace the rope with a fiber dead-end, such as a U-Bolt Dead-End or preform dead-end.

#### NOTE 2:

In parallel with the LC-Tag, IT and ET work together on a project to remove the damaged cable section and replace it with a new cable. This task is, most likely, a multi-year effort.

#### NOTE 3:

Do not confuse this condition with that described on [Page 16](#), where rope and tape are used to secure the OPGW to the lattice tower.

In this scenario, the rope and tape are used on the tower side of the dead-end – not out in the span. If the rope and tape were to fail, it is possible that the OPGW cable could fall onto the electric conductors beneath it.

### Action:

1. Initiate SAP Notification, Priority Code E.
2. Fix must not to exceed 12 months.
3. Replace rope with a fiber dead-end.
  - IF fiber dead-ends are not available, THEN contact IT for further direction.
4. Take close-up photos of the condition found.

## OPGW Condition Levels and Impact

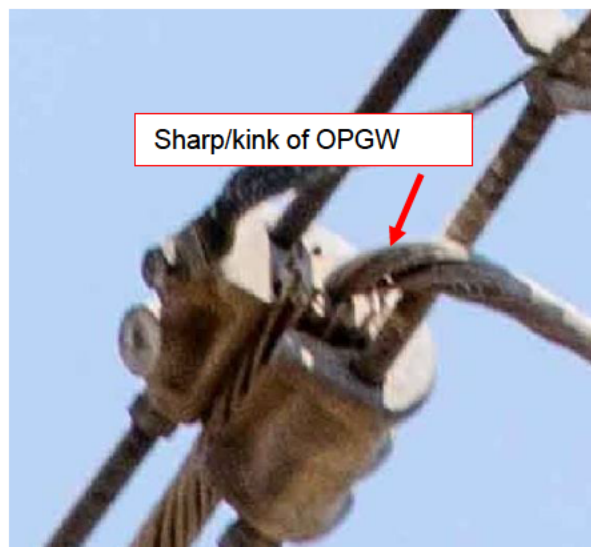
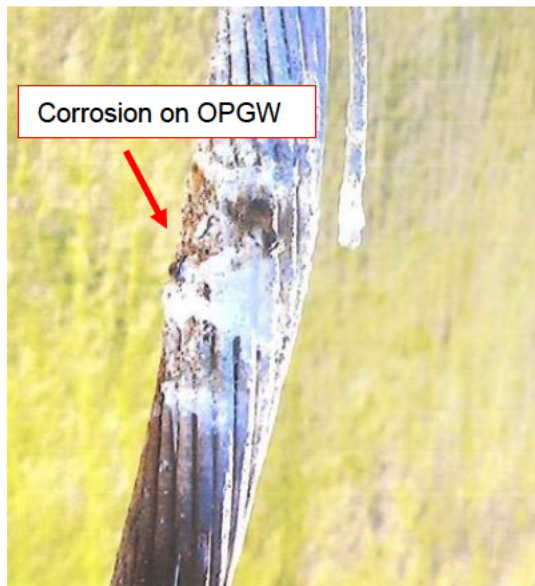
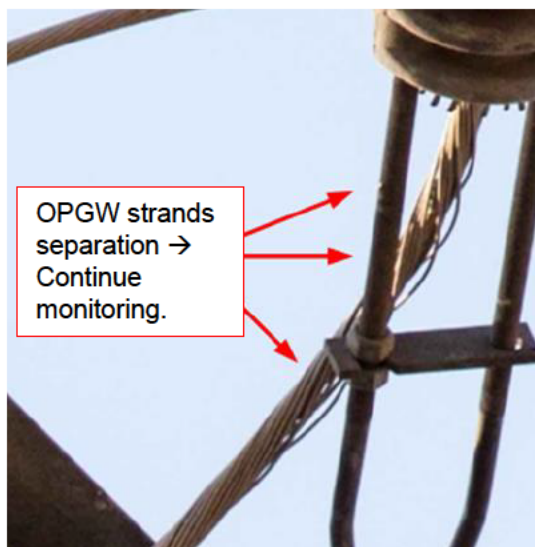
See Pages 30–37 for specific information on 500-kV conditions

Condition 3

**Sharp angle/kink, strands separation of OPGW, or severe corrosion.**

**Action:**

1. Initiate SAP Notification; Priority Code E.
2. Take close-up photos of the condition found.



## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

Condition 3

**OPGW coil is installed incorrectly/blocking step bolts.**

**Action:**

1. Initiate SAP Notification; Priority Code E.
2. Take close-up photos of the condition found.





## ADSS Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

### Condition 3

**OPGW is improperly secured to a structure with tape – within 10 feet of fiber slack coil.**

- Not a threat to fall onto the electric conductors or the general public.

#### Action:

1. Initiate SAP Notification, Priority Code E.
2. Take close-up photos of the condition found.



Tape attaching OPGW  
to tower member

## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

### Condition 2

Distance of U-Bolt housing from end of rods  $< 0.5"$  exposed thread.

Distance of preform strands outside of housing is not in the desired range of  $1/4$ – $1"$ .

Clearance between OPGW and spacer bar is less than  $1\text{--}1/2"$ .

### Action:

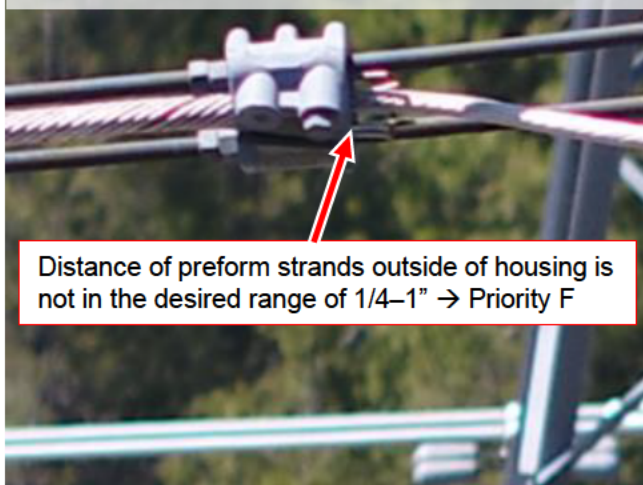
1. Initiate SAP Notification; Priority Code F.
2. Take close-up photos of the condition found.

Appropriate Location of Housing



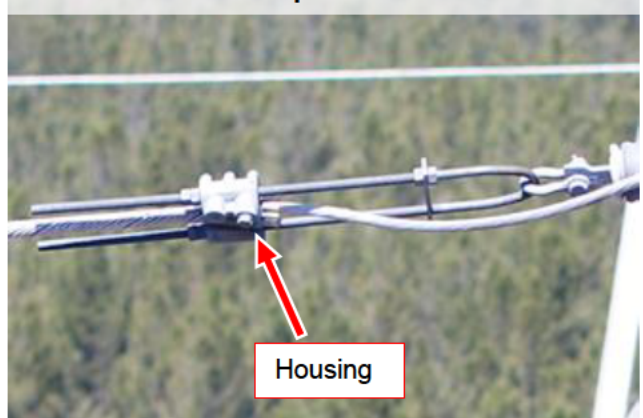
- Housing and spacer bar are in close proximity.
- From this angle, we are unable to determine if  $1.5"$  radial clearance is present.
- Other images are required to determine any potential action.

No work to be performed by T-Line M&C. IT to review, assess, and determine next steps, if needed.



Distance of preform strands outside of housing is not in the desired range of  $1/4$ – $1"$  → Priority F

Location of housing is not as desired, but installation is OK, since  $1.5"$  separation is maintained between spacer bar and OPGW.



Housing



## OPGW Condition Levels and Impact

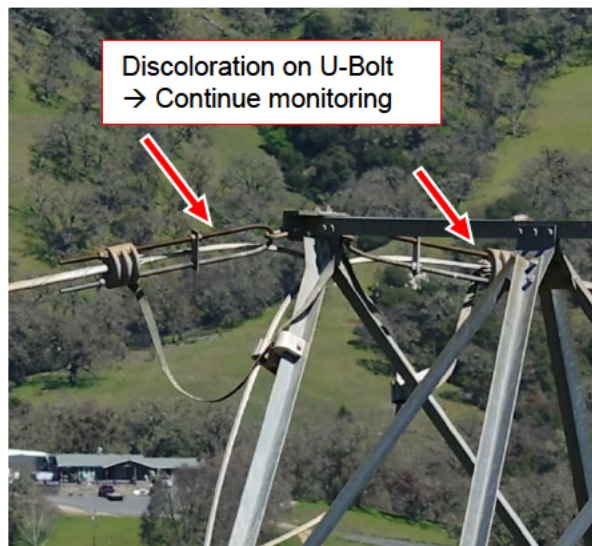
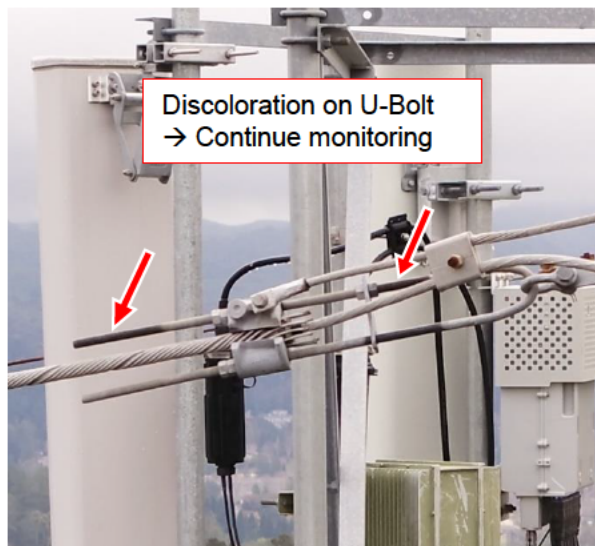
See Pages 30–37 for specific information on 500-kV conditions

Condition 2

### Discoloration on U-bolt.

### Action:

1. Initiate SAP Notification; Priority Code F.
2. Take close-up photos of the condition found.





## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

### Condition 2

Cell/Antenna cabling installed within less than 10 inches of OPGW cable and cell antenna vertical clearance to OPGW is less than 24 inches.

OPGW installed through cell array to maintain 24-inch vertical clearance from all cell panels and 10-inch to associated cell/antenna cabling.

### Action:

1. Follow [Utility Procedure TD-2014P-01, "Notification of Conditions to Third-Party Utility,"](#) to notify the 3<sup>rd</sup> Party of the Level 3 condition via [ElectricD3rdPartyNotificationsDesk@pge.com](mailto:ElectricD3rdPartyNotificationsDesk@pge.com).
2. Transfer the finding to the New Revenue Development (NRD) group at [NRDlineProjects@pge.com](mailto:NRDlineProjects@pge.com).
3. Take close-up photos of the condition found.



## OPGW Condition Levels and Impact

See Pages 30–37 for specific information on 500-kV conditions

Condition 1

### Pre-Existing Fiber Dead-End Safety Snub

#### NOTE 1:

Safety snubs are typically installed out past a damaged area on the OPGW cable, to provide a safety dead-end grip, in case the cable were to fail. The safety snub should be a U-Bolt Dead-End or Preform Dead-End – not rope.

#### NOTE 2:

IT must confirm if a project has been created to remedy the issue.

### Action:

1. Inspector creates S5 SAP Notification.
2. CIRT reviews and confirms, saves S5 with unique Description (e.g., HOLD SNUB).
3. CIRT emails IT Inspection Team for review.
4. IT Inspection Team reports back to CIRT if a LC should be created or if the S5 notification is to be canceled. The IT Inspection Team provides a priority recommendation when responding to CIRT, for the fiber cable at the identified location.



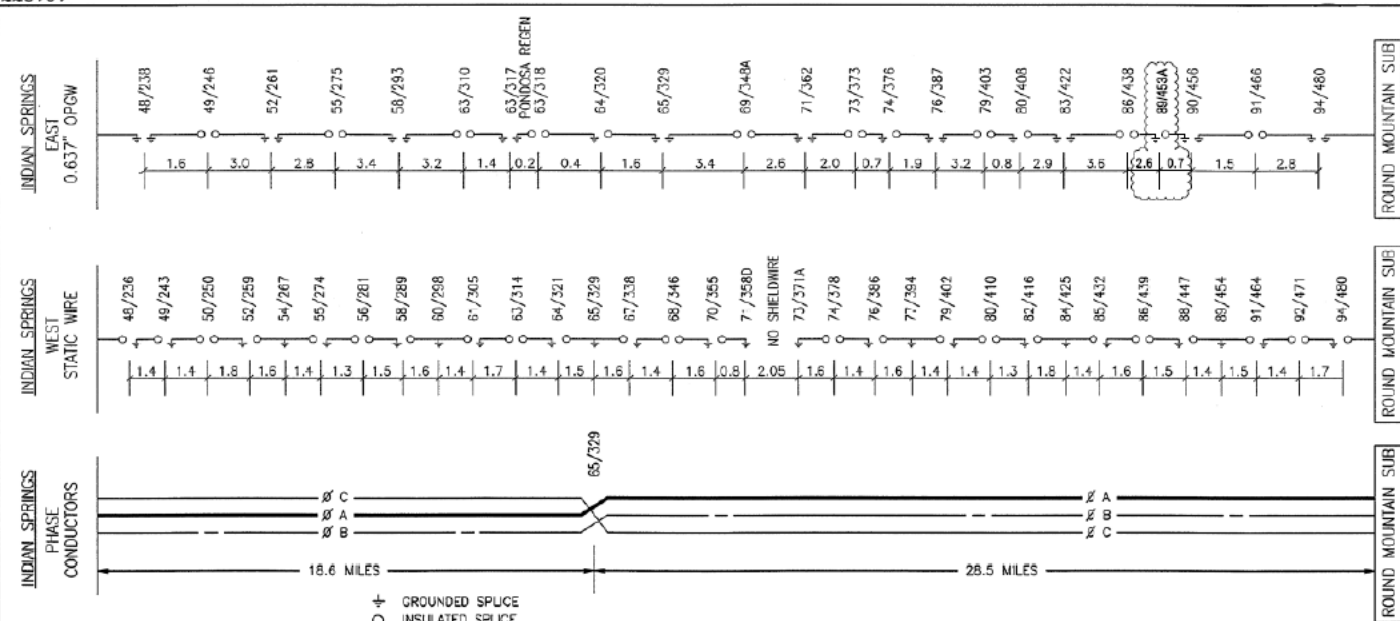
# Evaluating Conditions of OPGW in Transmission Line

TD-1001M-JA11  
Publication Date: 08/03/2023  
Effective Date: 10/03/2023  
Rev: 4

## Drawing 101377-7 for Indian Springs - Round Mountain #2 500 kV

- For 500-kV structures, OPGW is segmented (not grounded at every structure). Refer to [Drawing 101377-7, "Phasing and Transpositions: Indian Springs – Round Mountain, 500-kV Tower Line."](#)
- Pages 30–37 provide details specific to OPGW installed on 500-kV structures.

228101



IN 1998, 0.637" OPGW WAS INSTALLED IN EAST POSITION FOR ELI-FOCAS PER ORDER # 8005820. GROUNDING SCHEME AND ARRANGEMENT OF SHIELD WIRES WERE CHANGED. REVISION 5 OF THIS DRAWING WAS MADE IN 2004 FOR THIS CHANGE BASED ON AS-BUILT DATA PROVIDED.

### REFERENCE DRAWINGS:

STRUCTURE DATA SHEETS INDIAN SPRINGS-ROUND MTN. 500KV 213140-155

INDEX PHASING & TRANSPOSITIONS 214980

OPGW SPICE DETAILS 6026148, SH. 55-61 & 3100208-301

EAST LINE

7	4-12-19	ADD NEW SPICE AT 453A AND RESTRING 453A-456 WITH 632" OPGW TO REPAIR BROKEN SECTION	70033940	
8	8-28-16	ADD REF DWG FOR AS-BUILT OPGW HARDWARE INFO	2017906	
5	2-22-04	AS-BUILT INSTALLED 637" OPGW IN EAST POSITION IN 1998. STATIC WIRES CONFIGURATION CHANGED. CONVERTED TO AUTOCAD	8005820	
4	10-11-76	ADDED INFORMATION ON GROUNDWIRE NEW POSITION & REARRANGEMENT	185985	
NO.	DATE	DESCRIPTION	GM/ORDER	DWN
		REVISIONS	CHGD	SUPP
			APVD.	BY

APPROVED BY	GM	152278
	SUPV. R.	
	DSGN.	
	DWN.	
	CHGD.	
	C.K.	
	DATE	5-28-1995
	SCALE	NONE

PHASING AND TRANSPOSITIONS  
INDIAN SPRINGS - ROUND MOUNTAIN  
500KV TOWER LINE  
ELECTRIC TRANSMISSION & DISTRIBUTION ENGINEERING  
PACIFIC GAS AND ELECTRIC COMPANY  
SAN FRANCISCO, CALIFORNIA

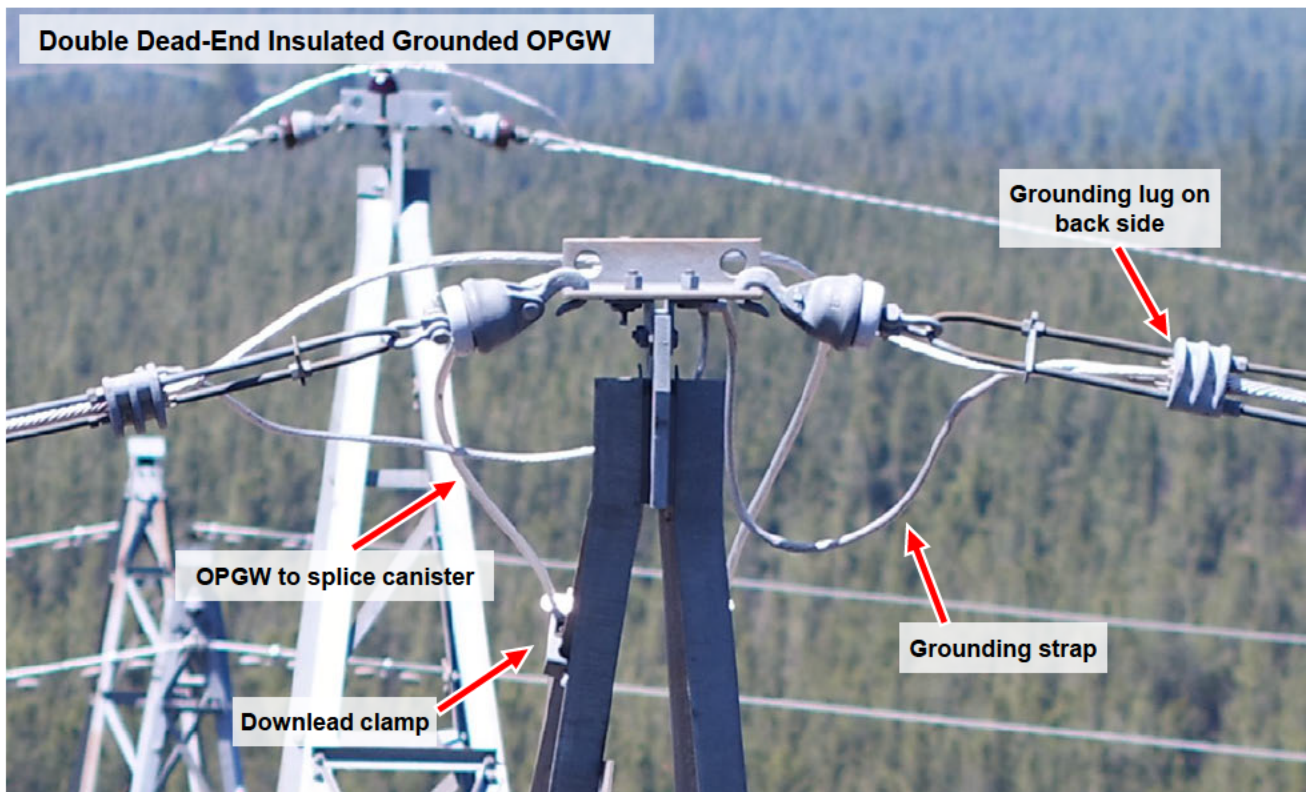
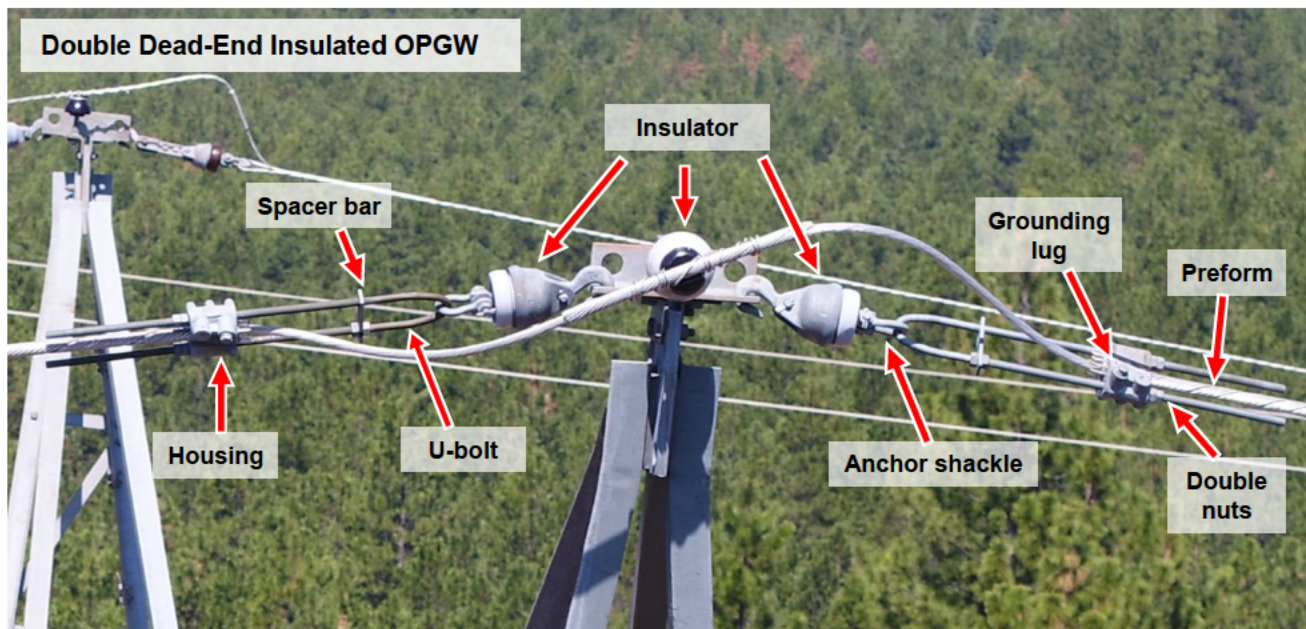
BILL OF MATERIALS
DRAWING LIST
SUPERSEDES
SUPERSEDDED BY
SHEET NO. 1 OF 1
101377-7

101377.DWG

SCAN 5 IC

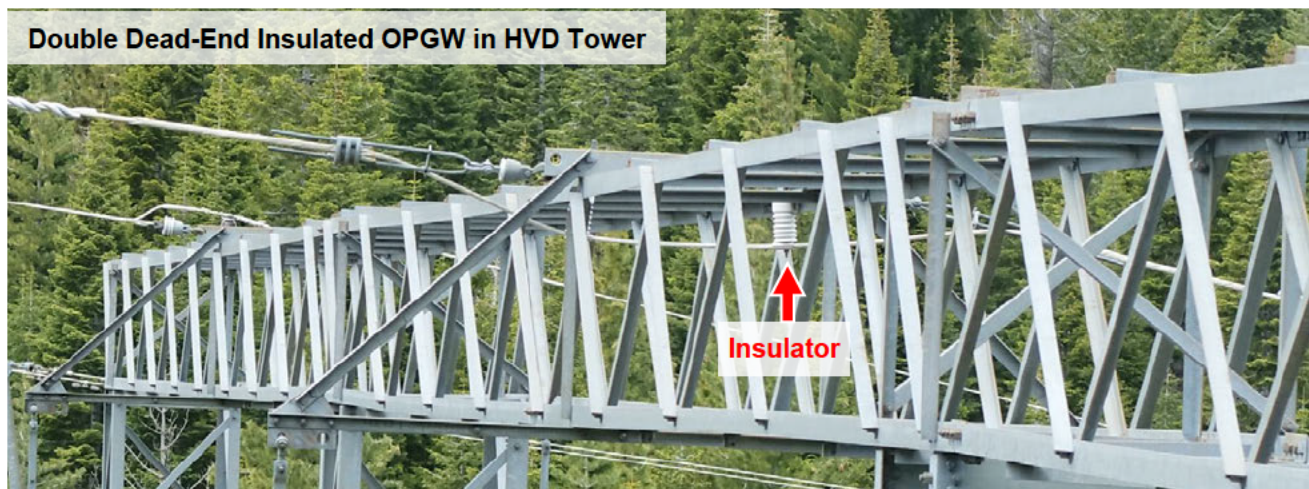
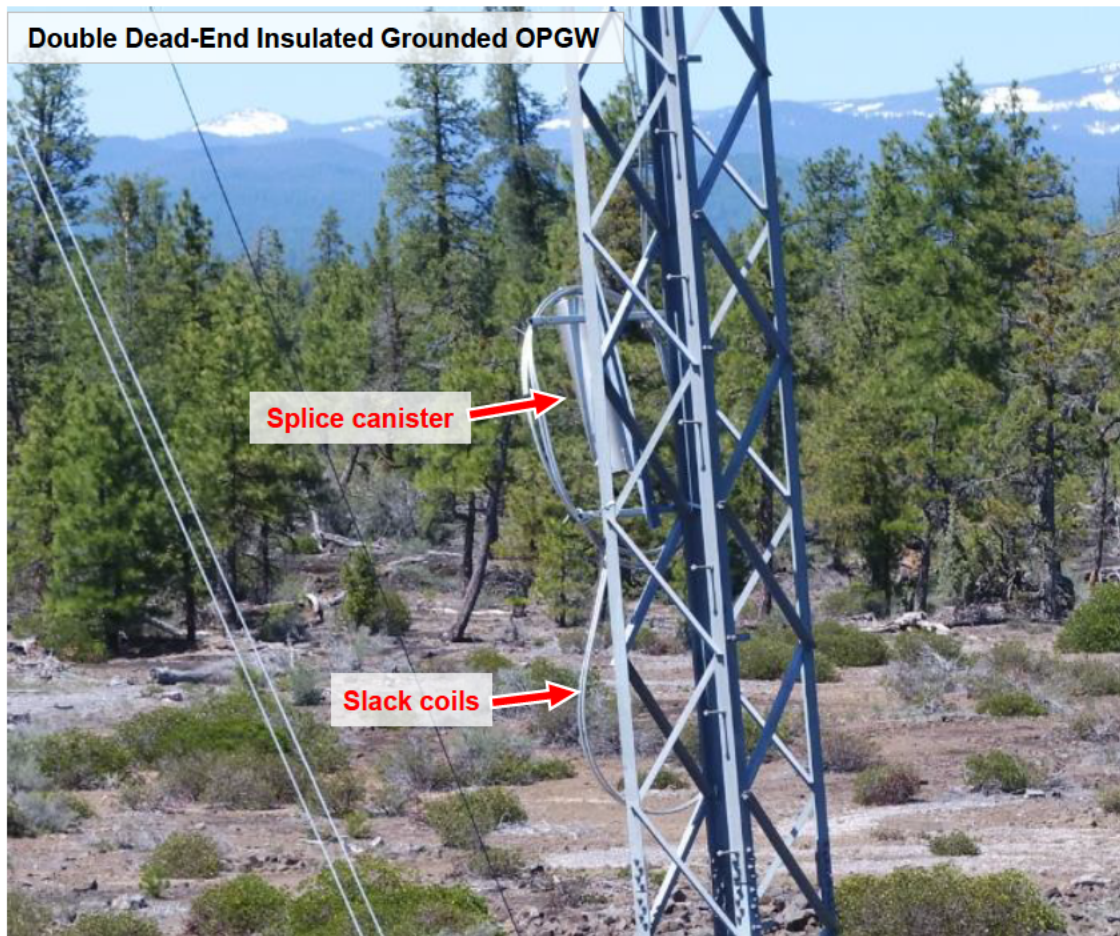


## OPGW Installations on 500-kV Tower





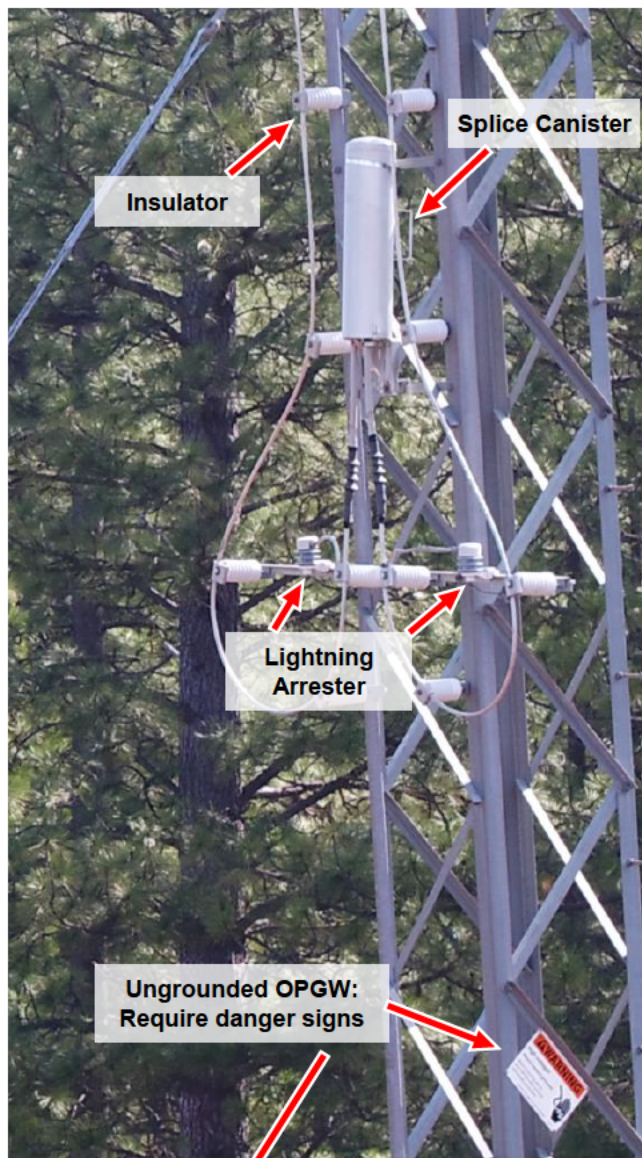
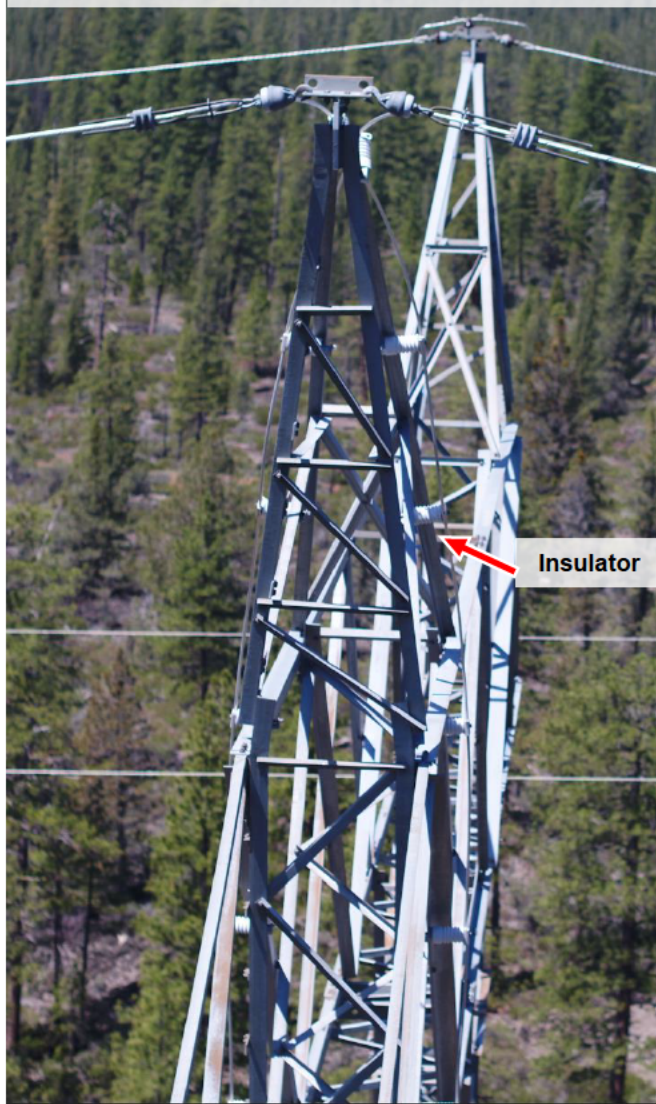
## OPGW Installations on 500-kV Tower (continued)





## OPGW Installations on 500-kV Tower (continued)

Double Dead-End Insulated Ungrounded OPGW





## OPGW Condition Levels and Impact

Condition 4

**Broken insulator.  
Blown arrester.**

**Action:**

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 3 months.
3. Take close-up photos of the condition found.

Correct Installation of Down-Lead Clamp



Damaged insulator → Priority E



Blown arrester → Priority E



Correct Installation of Lightning Arrester



## OPGW Condition Levels and Impact (continued)

Condition 4

**Missing** “Ungrounded OPGW High Voltage” sign on 500-kV structures.

### NOTE

The only OPGW installed on 500-kV structures in the system is the Malin-Round Mountain 500-kV circuit.

- Install the high voltage Warning sign at OPGW fiber splice locations where the OPGW cable(s) are not grounded (installed on insulators).
- If a singular OPGW cable or two are present AND each one is grounded to the structure, then the sign is not required.
- Install the sign in the vicinity of the fiber splice case.

### Action:

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 12 months.



## OPGW Condition Levels and Impact (continued)

Condition 3

### Missing Bird Guard

#### Action:

1. Initiate SAP Notification; Priority Code E.
2. Take close-up photos of the condition found.





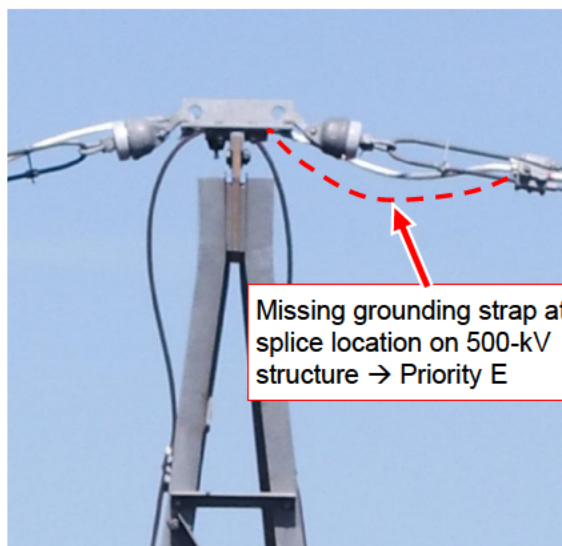
## OPGW Condition Levels and Impact (continued)

Condition 3

**Missing grounding strap at splice location on 500-kV structure.**

### NOTE

Use [Drawing 101377](#) to determine which structures are grounded and isolated.



### Action:

1. Initiate SAP Notification; Priority Code E.
2. Fix not to exceed 12 months.
3. Take close-up photos of the condition found.

### Correct Installation of Grounded OPGW



End of Instructions