



**Comments for CPUC Utility Pole Census  
and Competitive Access Order  
Instituting Investigation, 17-06-027**

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CPUC Public Participation Hearing  
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California Operates State Pole Safety Rules including General Order 95, per 47 USC 224, Administered by the California Public Utilities Commission. CPUC General Order 128 Governs Underground Electric and Utility Facilities.

STATE OF CALIFORNIA

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**RULES**

FOR

Overhead Electric Line Construction

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Prescribed by the  
PUBLIC UTILITIES COMMISSION

OF THE

**STATE OF CALIFORNIA**

GENERAL ORDER No. 95

# Power Line Anatomy 101

**W**hat do you see when you look at a power line? What are all those attachments, and why are they important?

The power lines that carry electricity from the substation to your home or business are called distribution lines. They are part of a system of poles, wires, transformers and other equipment used to deliver electricity.

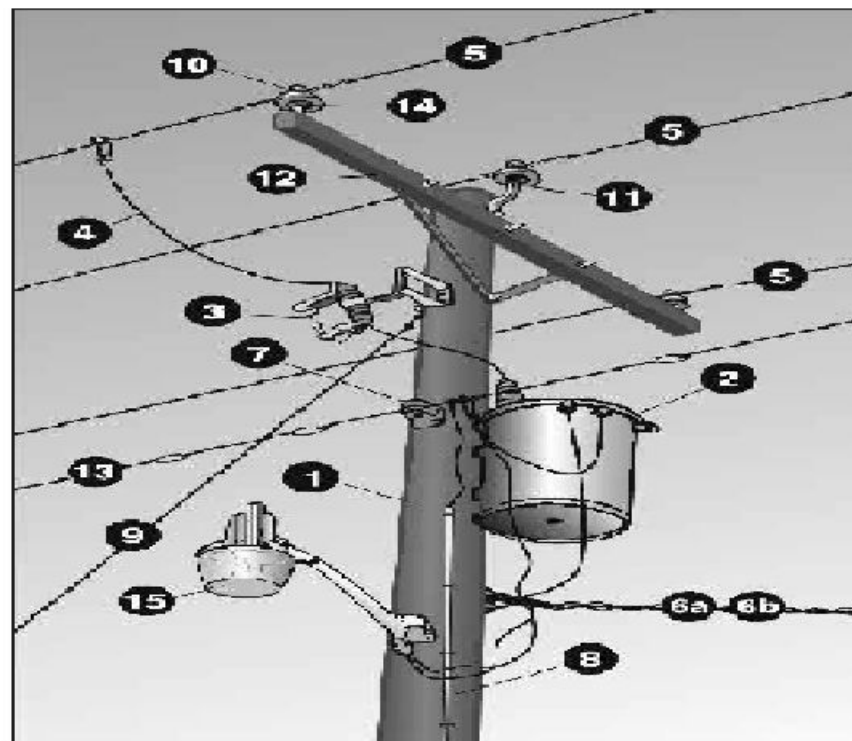
Sometimes the power lines are buried underground. However, more frequently they are run overhead.

Below is a description of the main components of an electrical distribution system.

**1. Utility pole:** The half-ton wooden pole is the backbone of the electrical line. It is partially buried to support all of the equipment. It usually is about 40 feet in length, and typically is made from logs made of cedar, pine or fir trees.

**2. Transformer:** The cylindrical metal tank-shaped device steps down the voltage to a level safe for delivery to the customer, either 120 or 240 volts. Many transformers have a lightning arrester, which protects them from a strike.

**3. Fused cutout:** This provides overload protection. A link inside a fiberglass barrel operates the cutout, which isolates the tap from the main line.



When a loud blast is heard from a utility pole, it is the fused cutout operating.

**4. Wire and clamp:** This wire is secured by a clamp, and connects the main line to the transformer.

**5. Primary conductor:** This is the main series of wires that carries electricity from the supplier to the consumer through the distribution system. A three-phase line—typically used to serve large power

users, such as commercial and industrial accounts—has three separate current-carrying conductors. A single-phase line—which serves most homes—has just one current-carrying conductor.

**6. Secondary tap (hot and neutral):** This conductor carries electricity between the transformer and the consumer's electric meter.

**7. Strain insulators:** These ceramic objects

hold the conductors in place and insulate them from the pole.

**8. Pole ground wire:** This wire is connected to a metal rod driven eight feet into the ground. Its job is to ground the system.

**9. Guy wire:** This stranded wire helps stabilize the pole. Hardware connects it to the pole and an anchor in the ground.

**10. Insulators:** These porcelain or rubber objects support the electric wires and prevent an undesired flow of electricity.

**11. Pole-top pins:** These support the insulators on the pole.

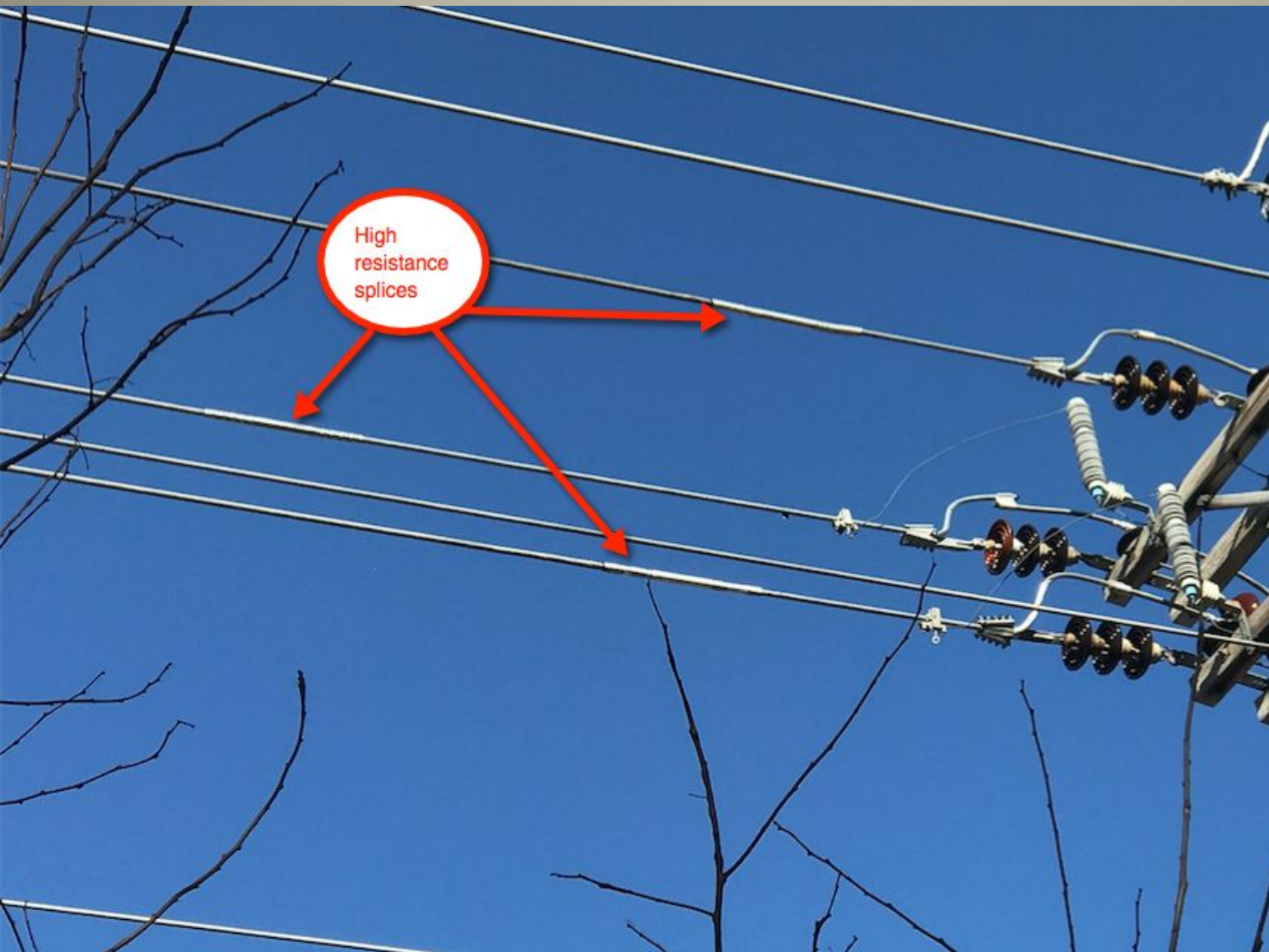
**12. Crossarm and braces:** This is the horizontal piece on the pole that makes the structure look like a cross. It holds the insulators, and keeps the lines on a three-phase line from touching one another. It usually is made of the same wood as the pole.

**13. Main line neutral conductor:** This wire is the neutral conductor in a distribution circuit.

**14. Insulator pins:** These support the insulators on the crossarm.

**15. Security light:** Although not on all power poles, a dusk-to-dawn light is visible on many power poles.





The CPUC identified vegetation management, electric conductors (wires), and splices as the most frequent causes of utility-involved fires

CPUC Wildfire and Utility Infrastructure En Banc, January 2018

Electric Line Splice

**SAFETY, RESILIENCY, AND MAINTENANCE ISSUES,  
Dangling wires, Campbell, CA (Issue repaired, 2016),  
photo by Catherine Sandoval**





Joint Use Pole with Dangling Wire, Campbell, CA  
Pole Replaced with PEG pole, Nov. 2016,  
photo by Catherine Sandoval



“Buddy Pole,”  
created by  
PG&E when new  
utility pole  
planted to  
replace leaning  
pole, Nov. 2016,  
Campbell CA.

Photo by  
Catherine  
Sandoval,  
Nov. 2016

Buddy Pole still  
in place with  
Telecom lines  
attached,  
May 2018





Leaning Pole,  
Campbell, CA  
Photo taken in 2016  
by Catherine Sandoval

Pole still leaning,  
May 2018









Top of braced Buddy Poles with Bottom cut off, Held up by Wooden Post,  
San Jose, California, Willow Glen Neighborhood, February 2018.

Photo by Christopher Klapperich

Climbing Space to Electric Facilities Obstructed

Buddy Pole removed by March 2018, climbing space still obstructed







Internet Power  
Equipment on “Peg”  
at angle on Pole,  
Los Gatos, CA

Photo by Catherine  
Sandoval, March 2018





Peg on Pole with  
telecom wires  
attached,  
Campbell, CA

Photo by  
Catherine Sandoval  
January 2018



Peg of Old Utility Pole Tied to Utility Pole by Rope, Large Telecom Wire Coil, Electric Climbing Space Obstructed, San Jose, CA, Willow Glen Neighborhood, March 2018, Photos by Catherine Sandoval

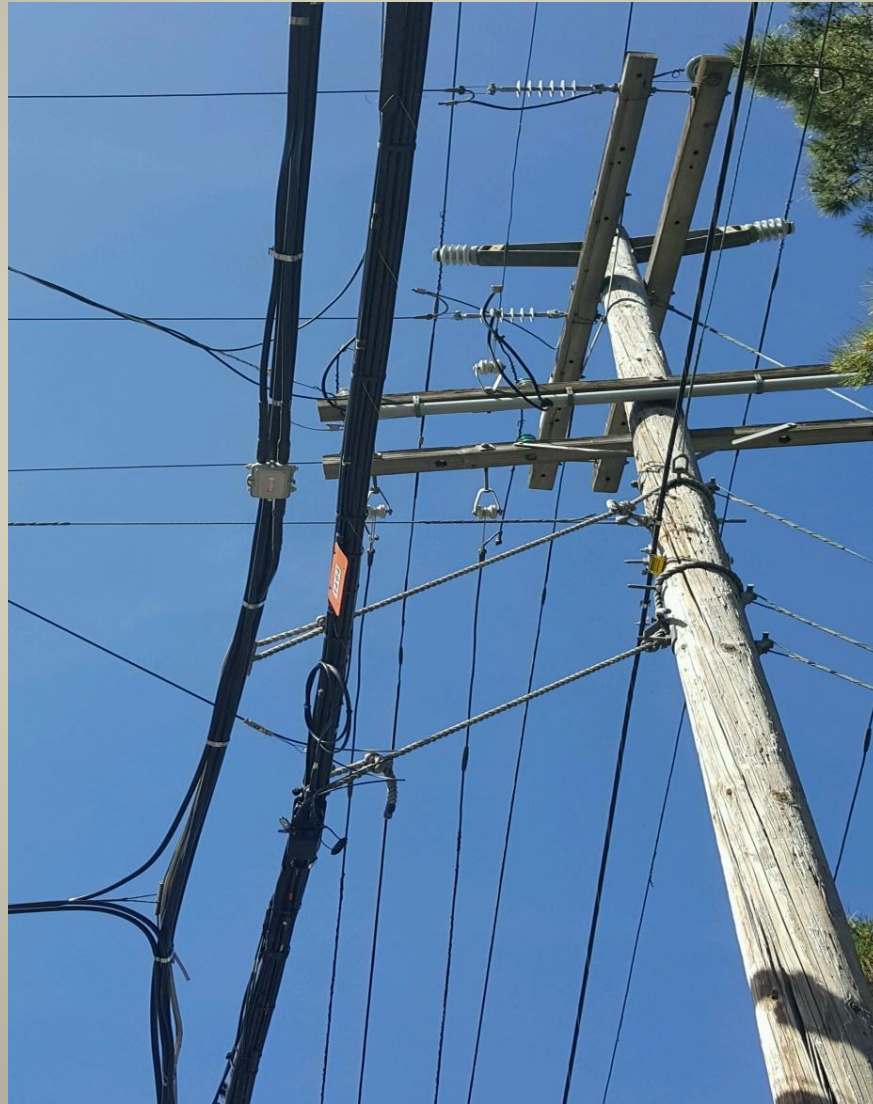


Telecom Remote Facilities linked to Conduit Taped to Joint  
Use Electric/Communication Utility Pole,  
San Jose, CA, Willow Glen Neighborhood  
March 2018, Photos by Catherine Sandoval

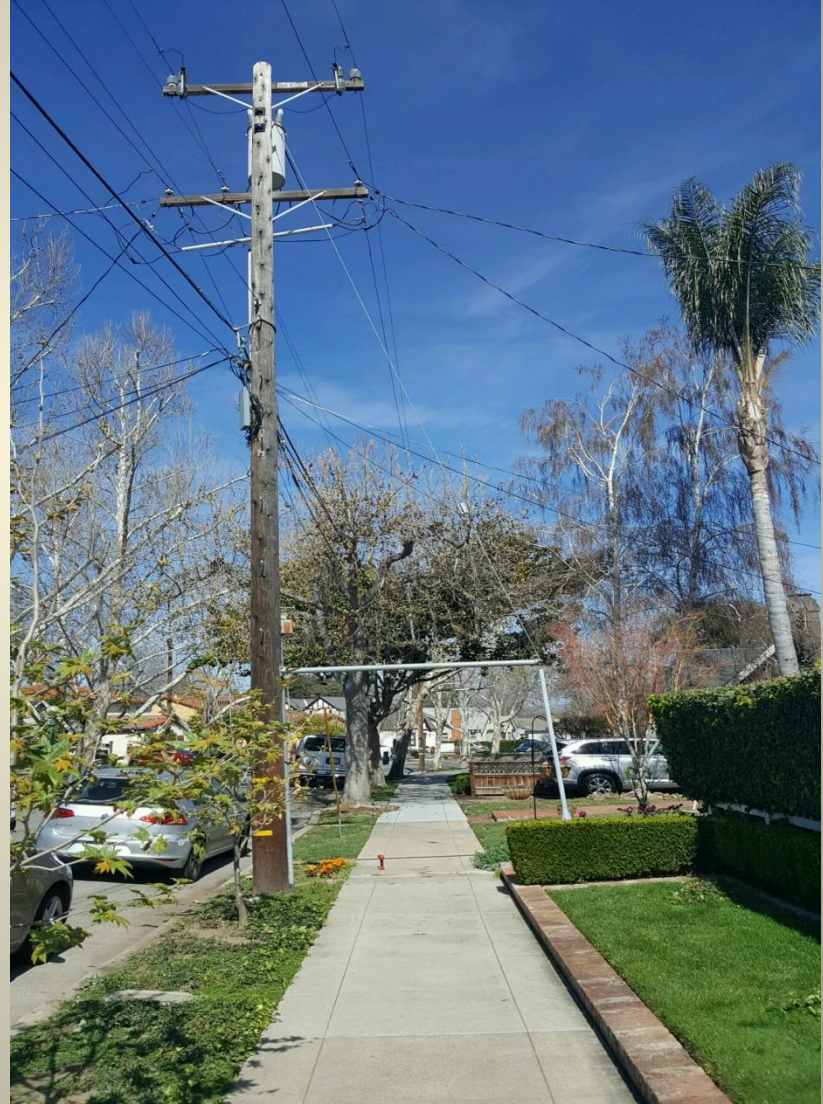




**SAFETY, RESILIENCY, AND COMPETITION Issues, Telecom wires tied by Rope to Pole, Electric Climbing Space Obstructed, San Jose, CA, Willow Glen Neighborhood, March 2018, Photos by Catherine Sandoval**



**SAFETY, RESILIENCY, AND COMPETITION Issues, Telecom wires tied by Rope to Pole, Electric Climbing Space Obstructed, San Jose, CA, Willow Glen Neighborhood, March 2018, Photos by Catherine Sandoval**





Large Telecom facility attached to pole  
McLaughlin Ave, San Jose, CA, Bonita-24th Neighborhood  
Photo by Catherine Sandoval May 2018





SAFETY, RESILIENCY, AND COMPETITION Issues, photo on left shows  
dangling wires, photo on right shows leaning Buddy Pole,  
Bonita-24th Neighborhood  
March 2018, Photos by Catherine Sandoval







Telecom Lines Attached  
to Tree, Sonoma CA

Photo by  
Michael Nicholls, 2018



Telecom Lines Attached to Trees, Photo on the Left, Telecom line threaded through dead tree, Sonoma CA, 2016, CPUC Ordered lines be moved to a proper utility pole.

Photo on right, Telecom lines tied to tree Felton, CA, 2016.

Photos by Catherine Sandoval







Telephone line attached to tree,  
Drew Meadow, CA, Next to  
Firefighter's Camp for 2013 Rim  
Fire

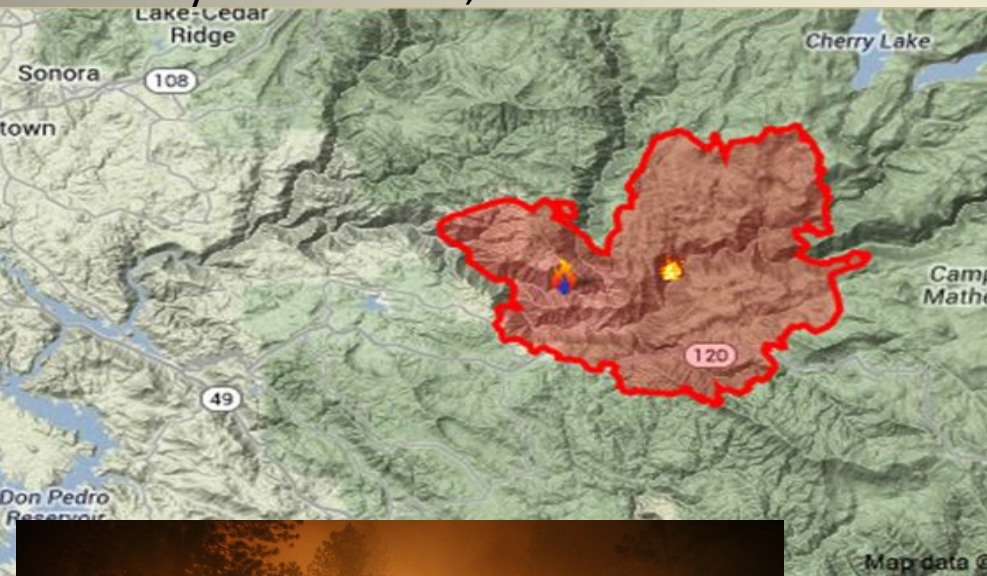
Tree dead or dying from bark  
beetle infestation in the  
background on the left.

Photo by Bill Johnston, 2016



CPUC Commissioner Sandoval (term served Jan. 2011-Jan. 2017) with Tuolumne County Supervisor Randy Hanvelt, standing next to low Telecom Line strung to dead and dying trees, abutting the site of the fire-fighters' campsite at Drew Meadows for the 2013 Rim Fire. Trees dead or dying from bark beetle infestation in the background.

Photo by Bill Johnston, 2016





## CPUC Enforcement Needed

- CPUC Resolution SED-3  
Adopted December 2016  
authorizes the CPUC Safety and Enforcement  
Division to document and fine violations of CPUC  
General Order 95
- Accountability Needed for Utility Pole Maintenance  
and Enforcement
- Maintenance and Enforcement Protects Public  
Safety, Service Reliability, and Promotes  
Competition

# Utility Pole Census and Competitive Access

## OII 17-06-027

- Utility Pole Census is needed to document condition of the approximately 5.5 million Utility Poles in California.
- Utilities, Pole Attachers, and Utility Pole Associations are not doing sufficient or speedy follow-up on Utility Pole maintenance and safety issues.
- Poor Utility Pole Maintenance increases cost for new competitive services and delays service deployment.



## Report Bad Utility Poles

- CPUC should create mechanism for the public to report bad utility poles.
- Telephone call and utility pole and wire problems can be reported today through the CPUC Call Completion Survey.
- CPUC needs to ensure swift follow-up from complaints to repairs.



Thank You!

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