Utility Pole Assessment and Tagging at Ameren

Utility pole inspection and treatment varies among Utilities. Ameren takes a pro-active approach to inspection and remedial treatment.

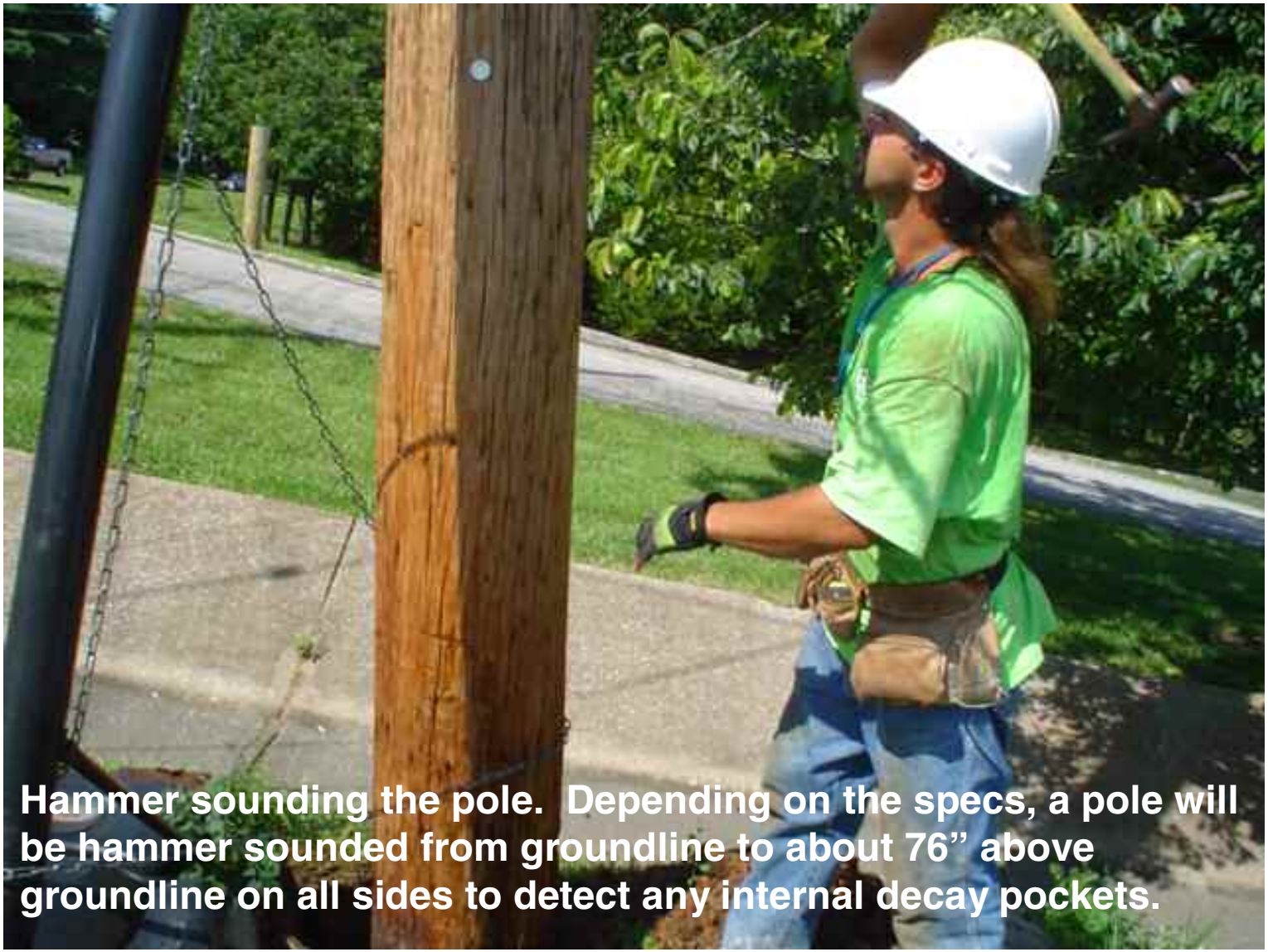
Distribution, sub-transmission and transmission poles are inspected in cycles and receive inspection methods that are distinct to the pole species. Inspection and treatment helps to;

1. Identify failing utility poles and assess the overall condition of the system.
2. Treatment helps to extend the life of the utility pole.
3. Both together provide for greater system reliability.

The industry standard for a safe utility pole requires 2 inches of good shell depth. Studies show that the greatest strength of a utility poles lies in the outer 2 inches of shell. Please note that this pole was cut to display it's remaining shell of approximately one inch.

Proper pole assessment employs at least 3 different forms of inspection.

1. A visual inspection as depicted below.
2. Sounding of the pole.
3. and boring the pole to measure remaining shell depth.



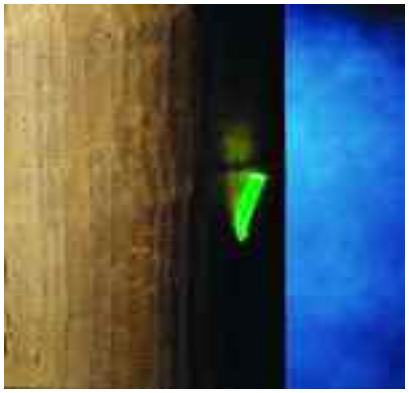
Hammer sounding the pole. Depending on the specs, a pole will be hammer sounded from groundline to about 76” above groundline on all sides to detect any internal decay pockets.

Groundline treatment of a sub transmission pole. The pole is excavated to a depth of 18". Decayed wood and rotted material is removed and a Copper Napthenate wrap is applied.

Pole tags play an important part in supporting the inspection cycle and AM/FM system.
Pole tags fall into a few different categories;

- Asset tags, used to support the AMFM system and Asset Management. (note, asset tags do not denote pole ownership.)
- Inspection tags, identify the inspection cycle.
- Treatment tags, identify the type of treatment used on the pole
- Equipment tags, identify various types of equipment on the pole, reclosers, switches, etc.
- Joint Use Tags, usually placed by third parties attached to the pole

Inspection tags and treatment tags. Both take on various shapes, but mean the same thing. The picture above is indicative of an inspection occurring in 2005 and remedial treatment using Cobra Rods.

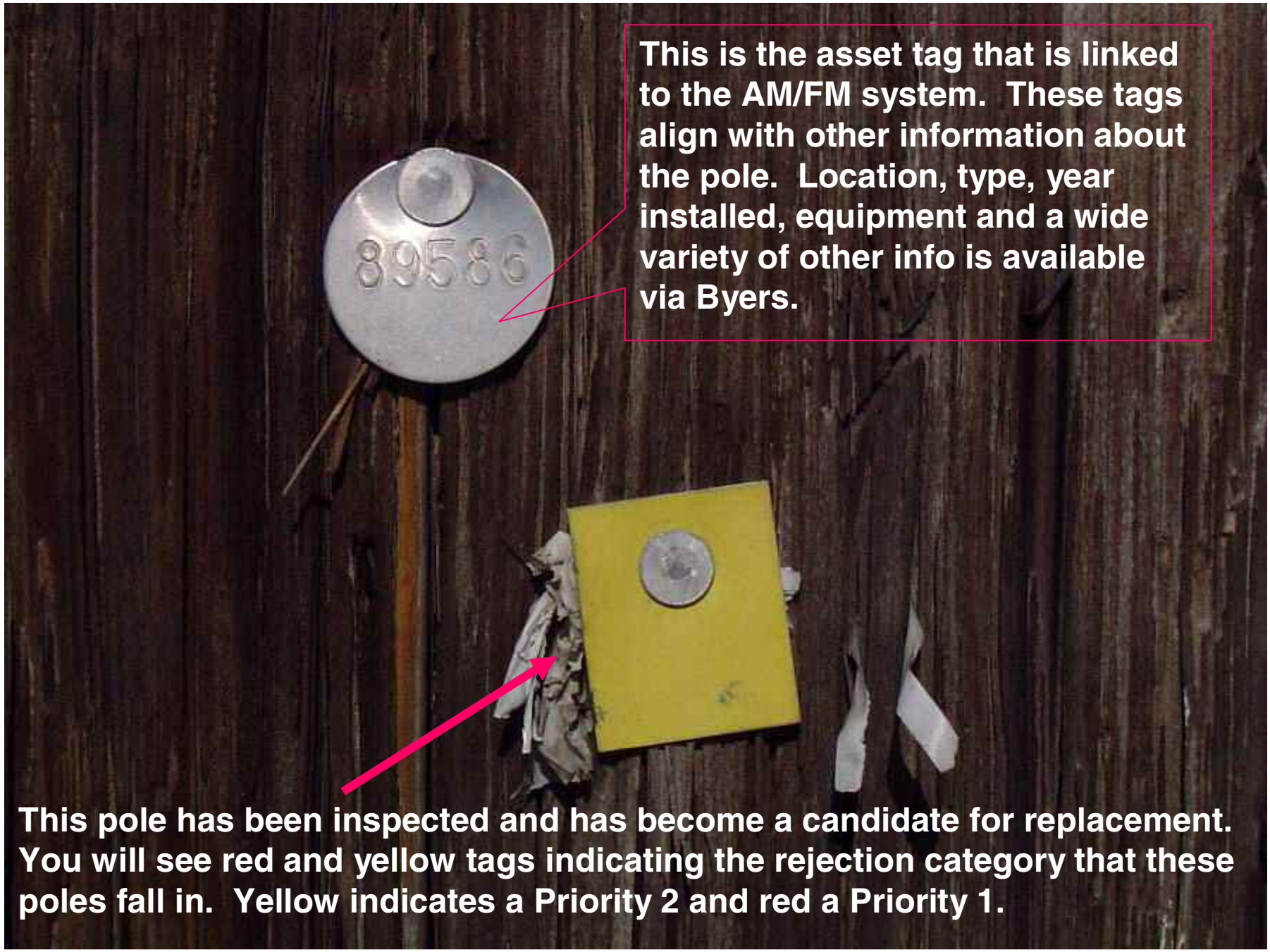


Cobra Rods are an alternative remedial treatment for preserving wood utility poles. They are safe to handle and are considered a general use pesticide.

The Inspection Tag (note the oval shape)

This is the treatment tag indicating MITC was used to treat the pole. (MSDS sheets are on file with the Ameren safety dept for all treatment types)

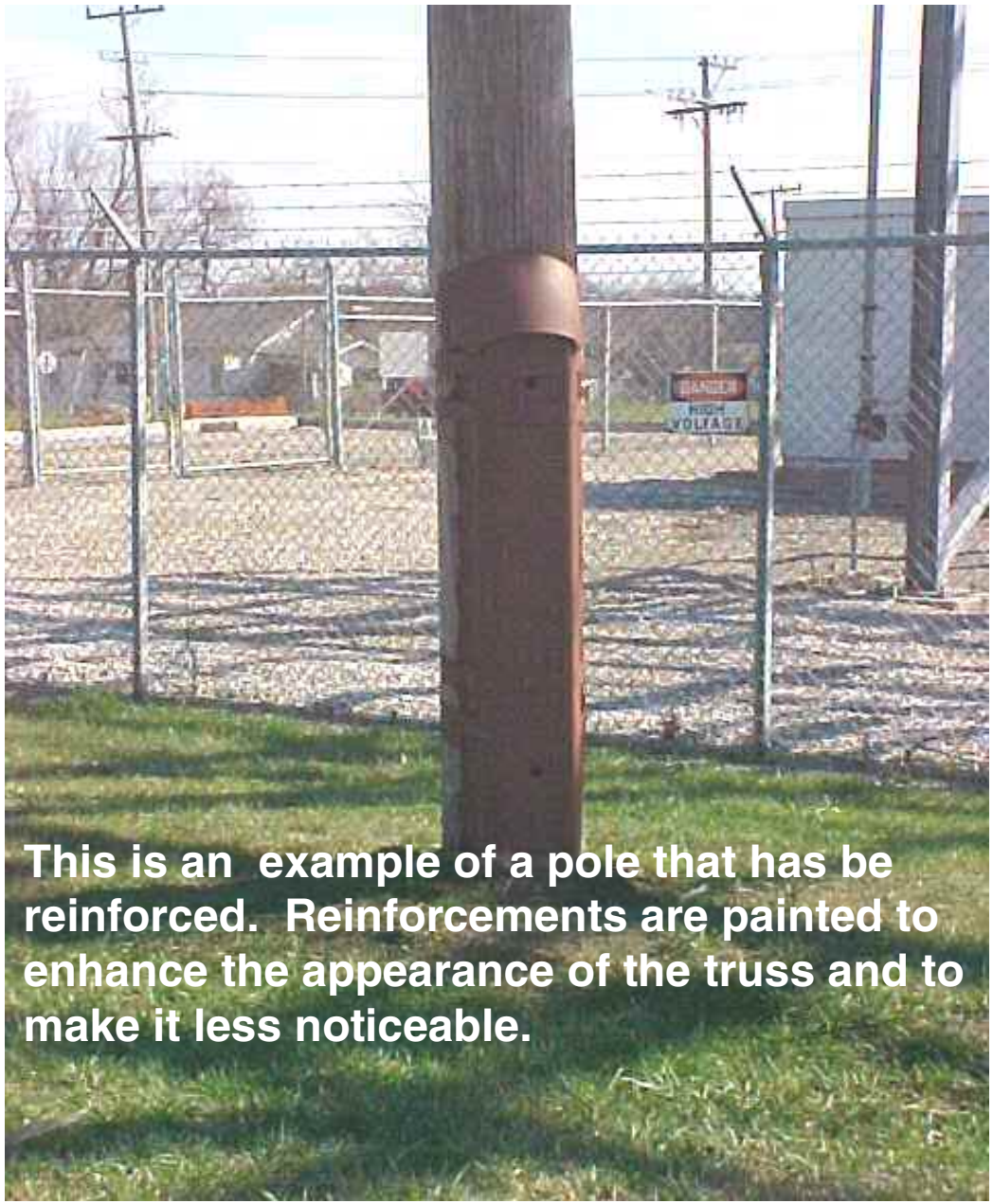
MITC Fumes have been around for a long time. As you can see by the gloved hand they are hazardous to handle. Typically they are diffused at installation.


89586
This is the asset tag that is linked to the AM/FM system. These tags align with other information about the pole. Location, type, year installed, equipment and a wide variety of other info is available via Byers.
This pole has been inspected and has become a candidate for replacement. You will see red and yellow tags indicating the rejection category that these poles fall in. Yellow indicates a Priority 2 and red a Priority 1.


This pole has been inspected in two different inspection cycles. It displays 2 different types of wood treatment and is a candidate for reinforcement.

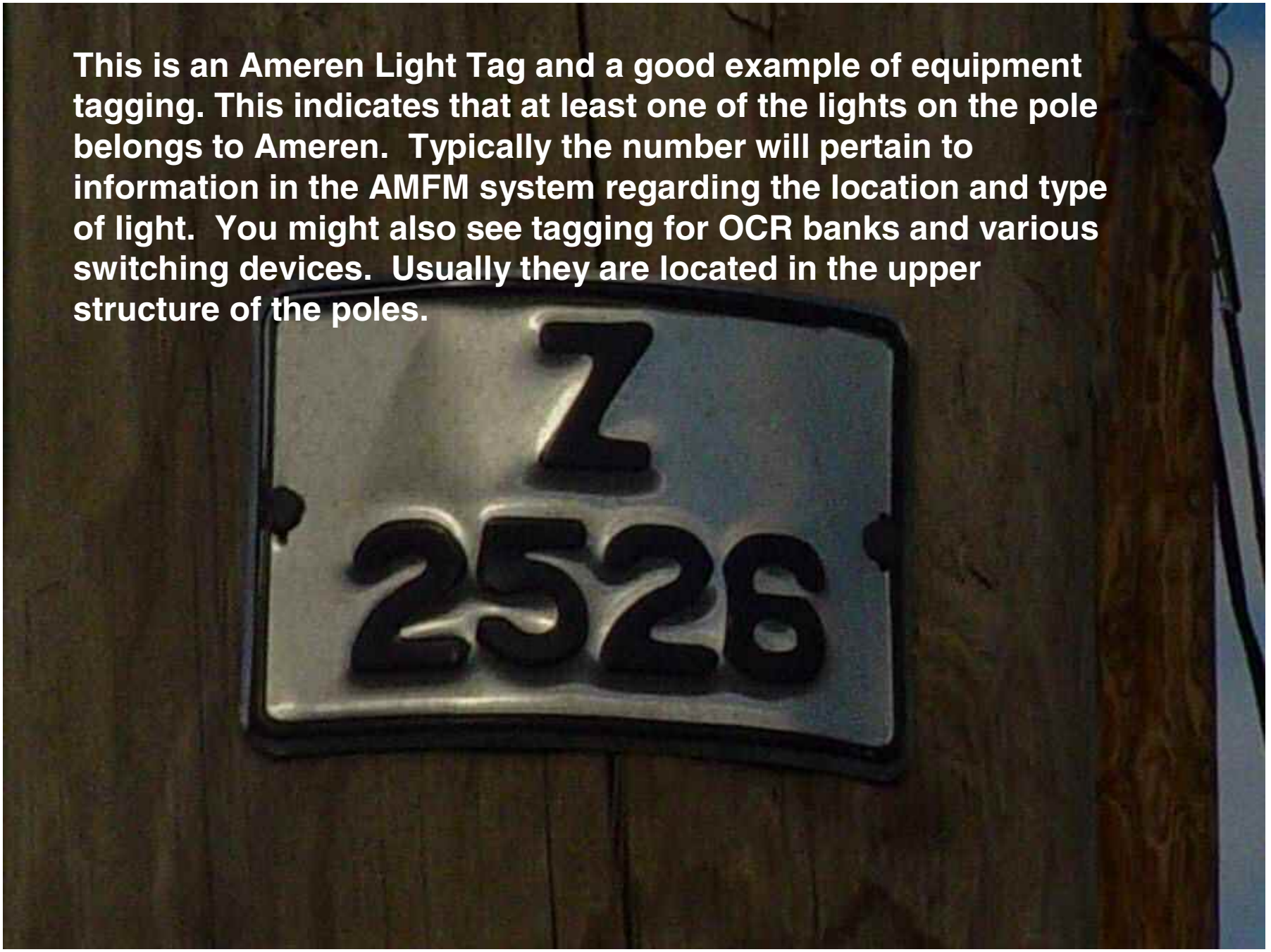

This is a typical reinforcement tag. The orange tape is just an eye catching product to help the reinforcement crew locate the pole.

This tag indicates a Priority Pole that needs to be replaced or reinforced in a timely fashion. Typically it will be damaged or decayed to the point that it cannot be restored.

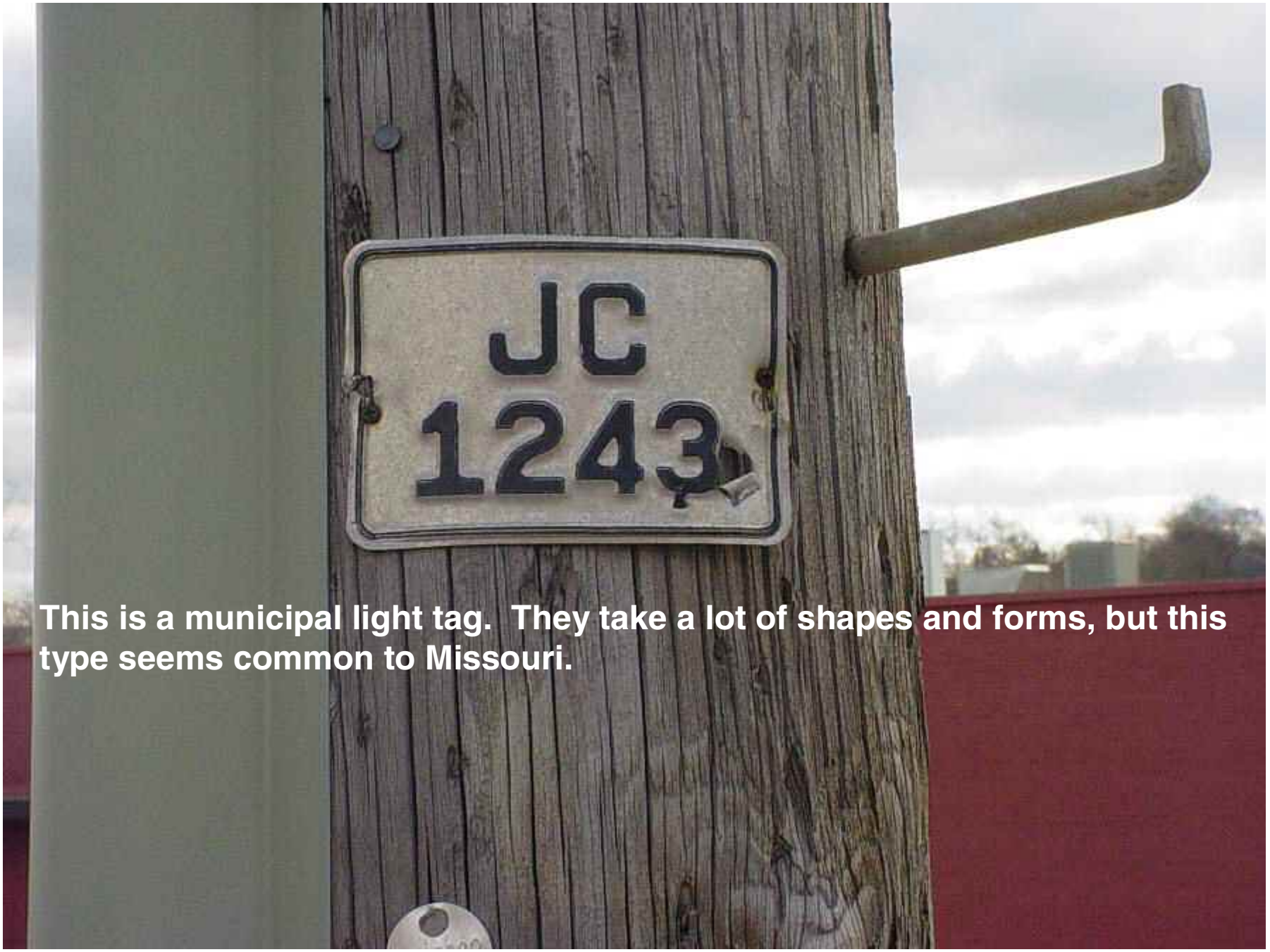


This is an example of a pole that has be reinforced. Reinforcements are painted to enhance the appearance of the truss and to make it less noticeable.

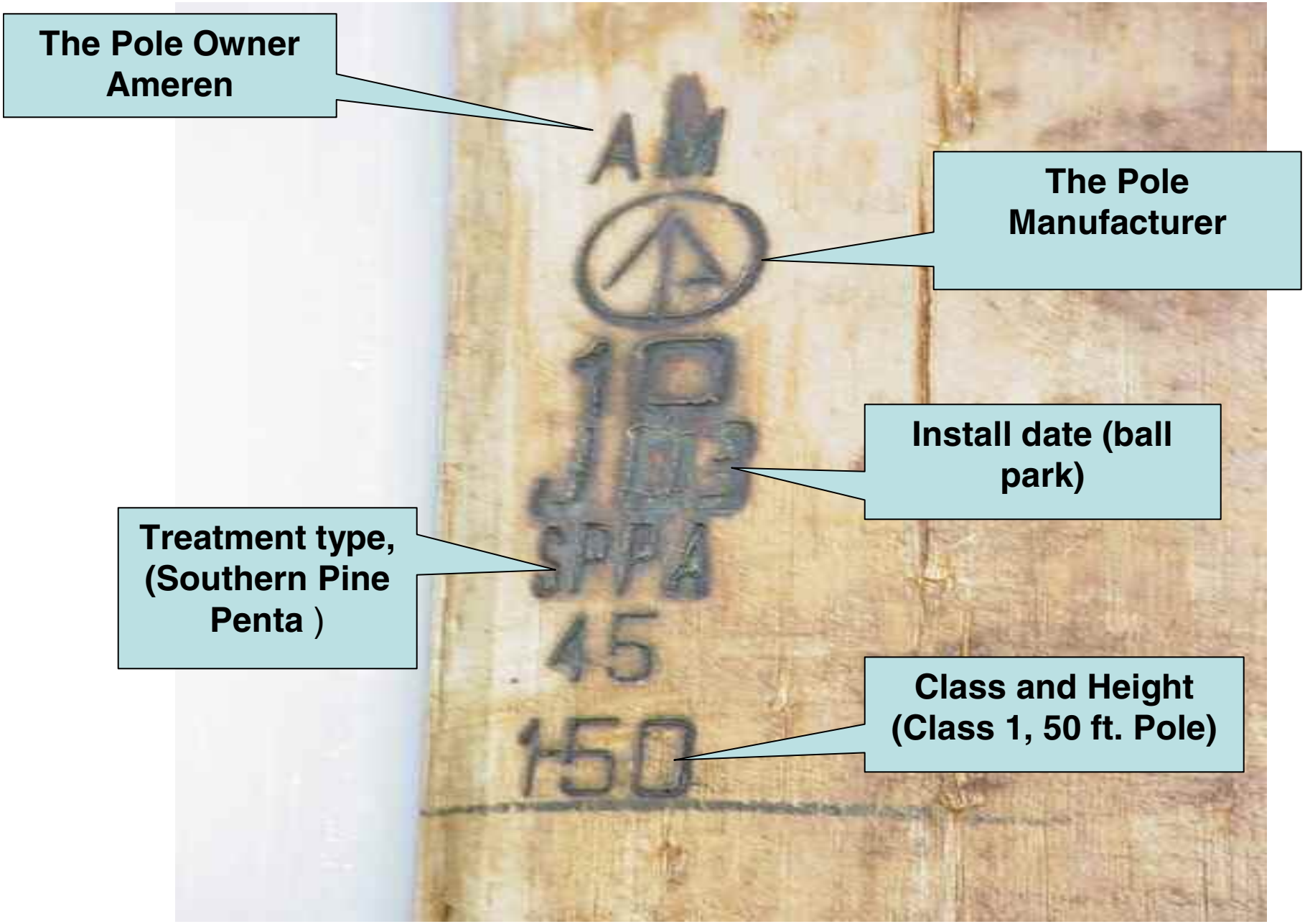

This is a good example of a joint use tag. Ameren, the phone company and cable company all have facilities on this pole
Asset Tag
SW
1285
Inspection Tag



This is an Ameren Light Tag and a good example of equipment tagging. This indicates that at least one of the lights on the pole belongs to Ameren. Typically the number will pertain to information in the AMFM system regarding the location and type of light. You might also see tagging for OCR banks and various switching devices. Usually they are located in the upper structure of the poles.



This is a municipal light tag. They take a lot of shapes and forms, but this type seems common to Missouri.


The Pole Owner
Ameren
The Pole
Manufacturer
Install date (ball
park)
Treatment type,
(Southern Pine
Penta)
Class and Height
(Class 1, 50 ft. Pole)
SPPA
45
150

Brands

- **Pole brands identify, class and height, ownership, manufacturer information, species and treatment type, batch numbers and history.**

- **Pole brands are placed in specific lengths from the butt of the pole and should typically appear at eye level if placed correctly in the ground. However, when looking for the brand look from ground level to above your head.**

- **Use the rule of 10% plus 2 feet. For instance, if you have a 70 foot pole it should be 7 ft. plus 2 feet or 9 feet in the ground.**

The bottom line is that you will see tags of all different descriptions, sizes and colors. Some are self explanatory and some are not. If in doubt contact the utility you are working with for an explanation of the tags purpose.

The following slides indicate some equipment you will see on poles and some conditions affecting the integrity of the utility pole or presenting a dangerous condition.

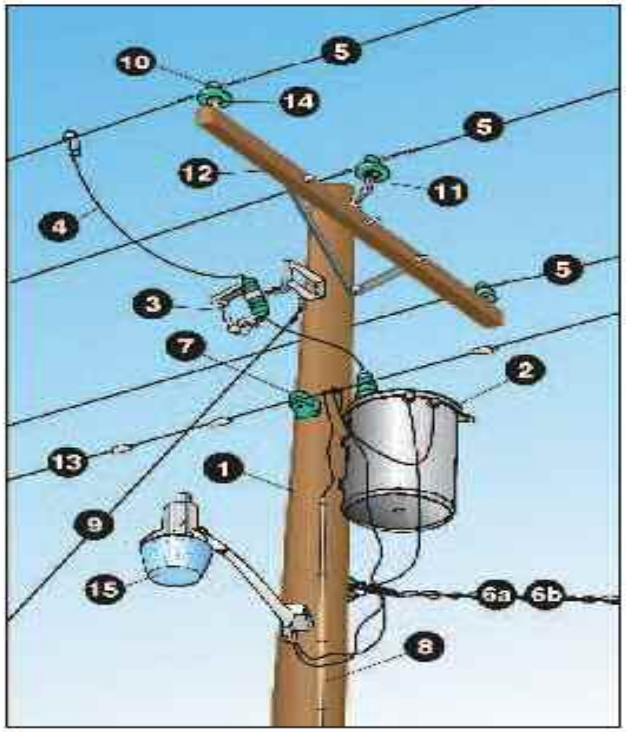
Power Line Anatomy 101

What 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 arrestor, 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.

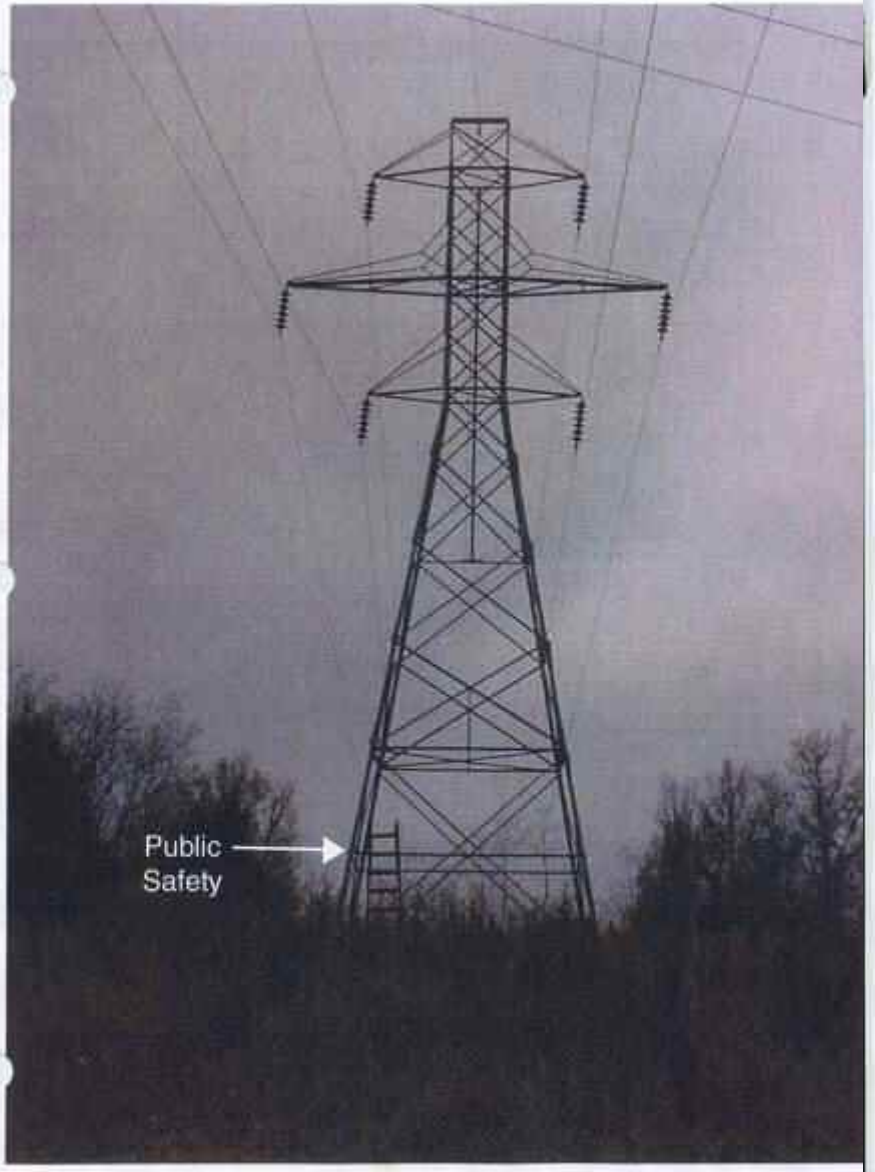
11. Pole-top pins: These support the insulators on the pole.

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.

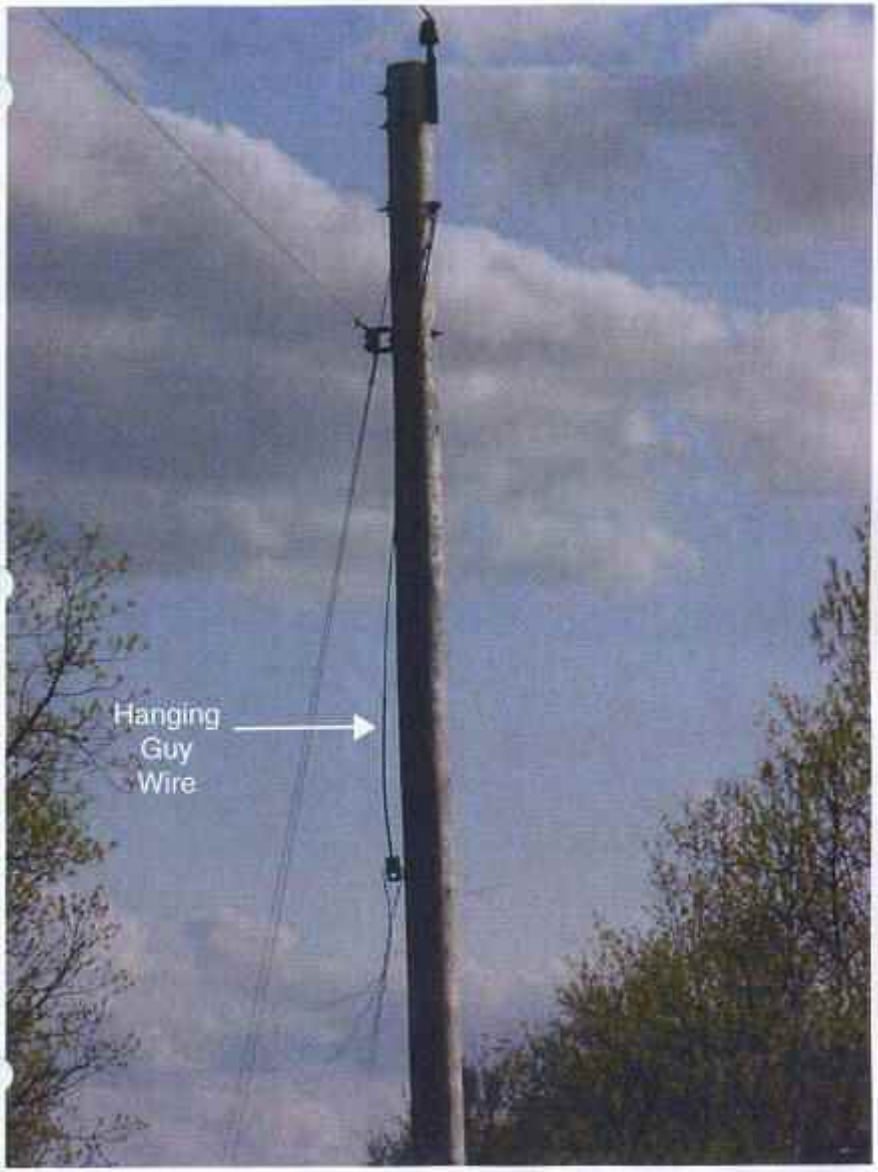
13. Main line neutral conductor: This wire is the neutral conductor in a distribution circuit.

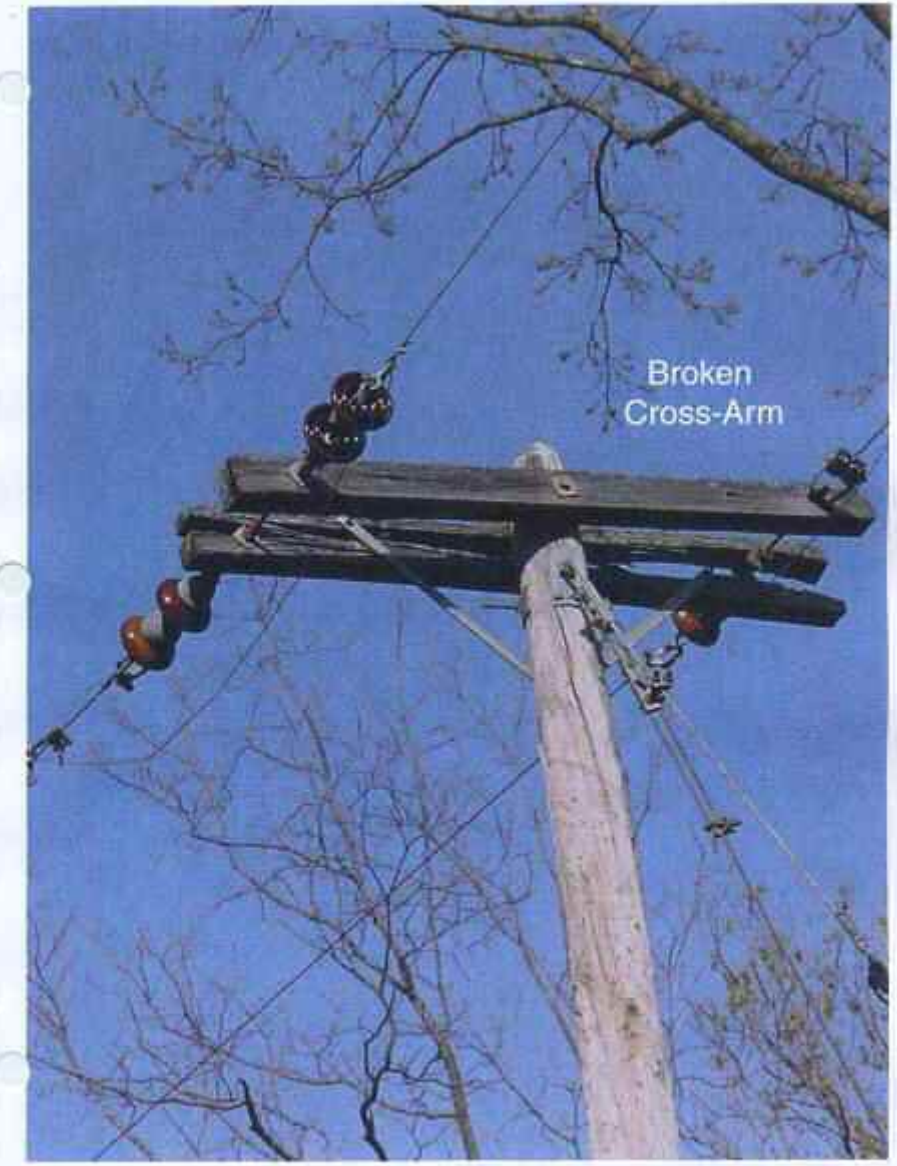
14. Insulator pins: These support the insulators on the crossarm.

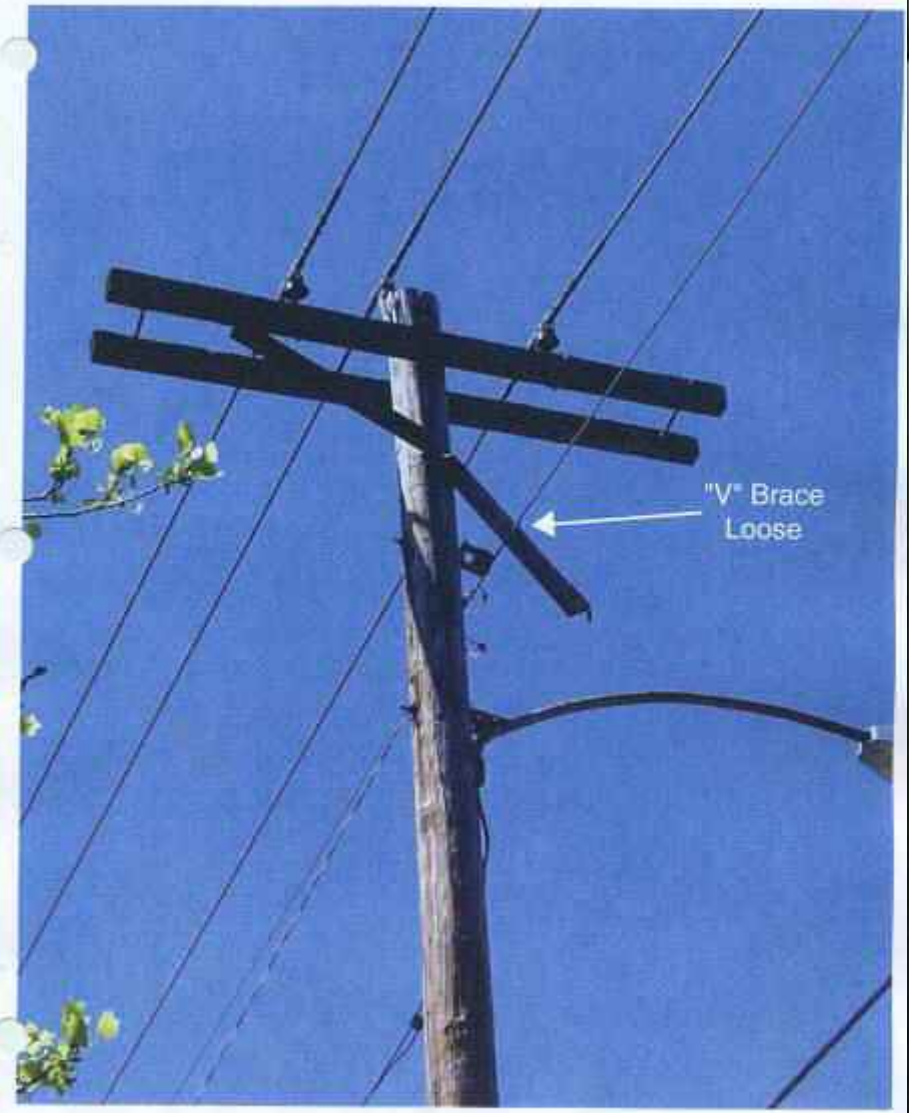
15. Security light: Although not on all power poles, a dusk-to-dawn light is visible on many power poles.

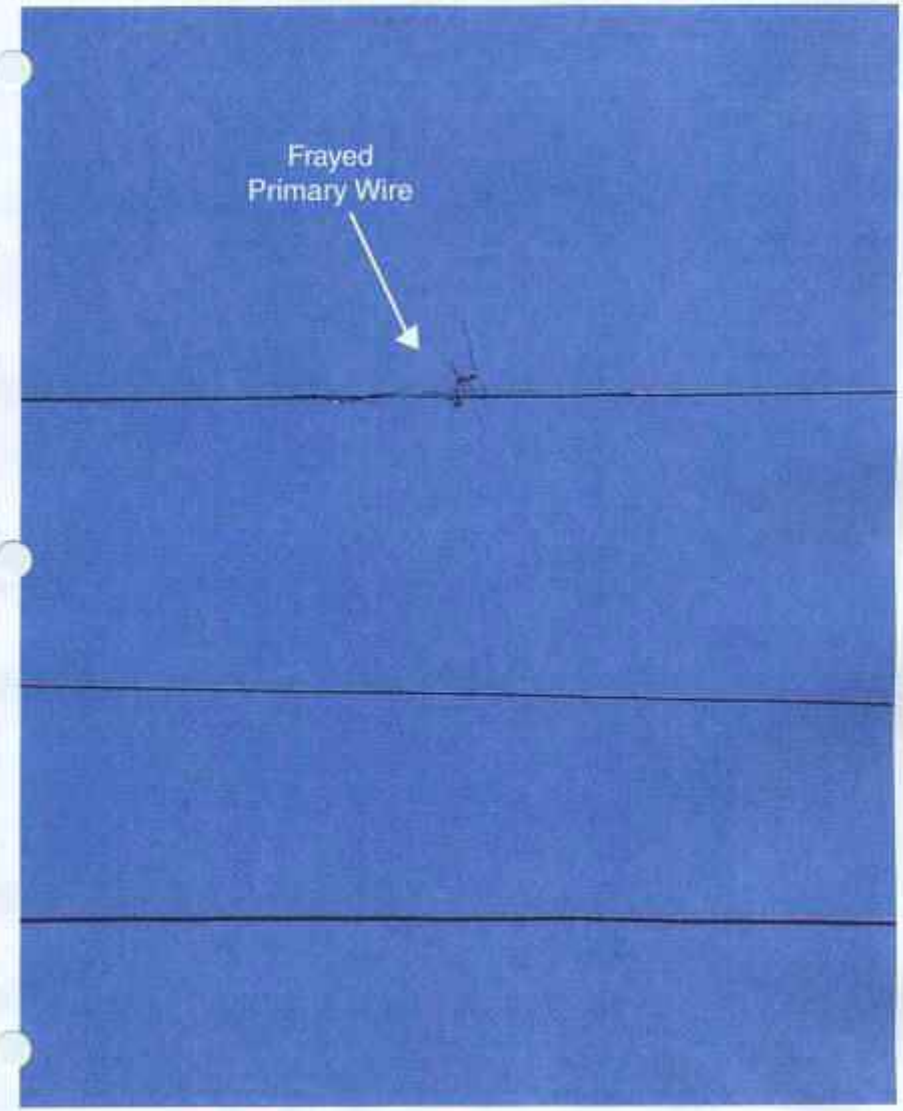

Public
Safety


Leaning Pole


Hanging
Guy
Wire


Broken
Cross-Arm

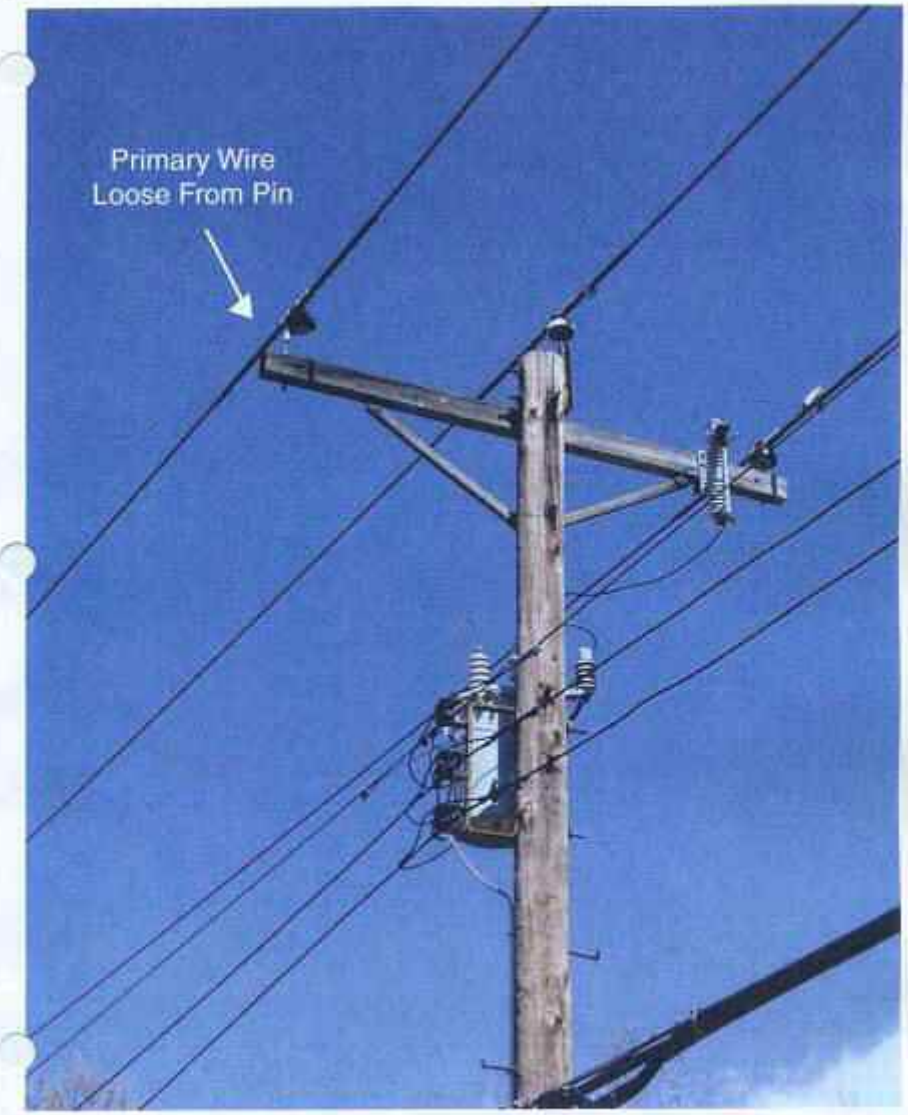

"V" Brace
Loose

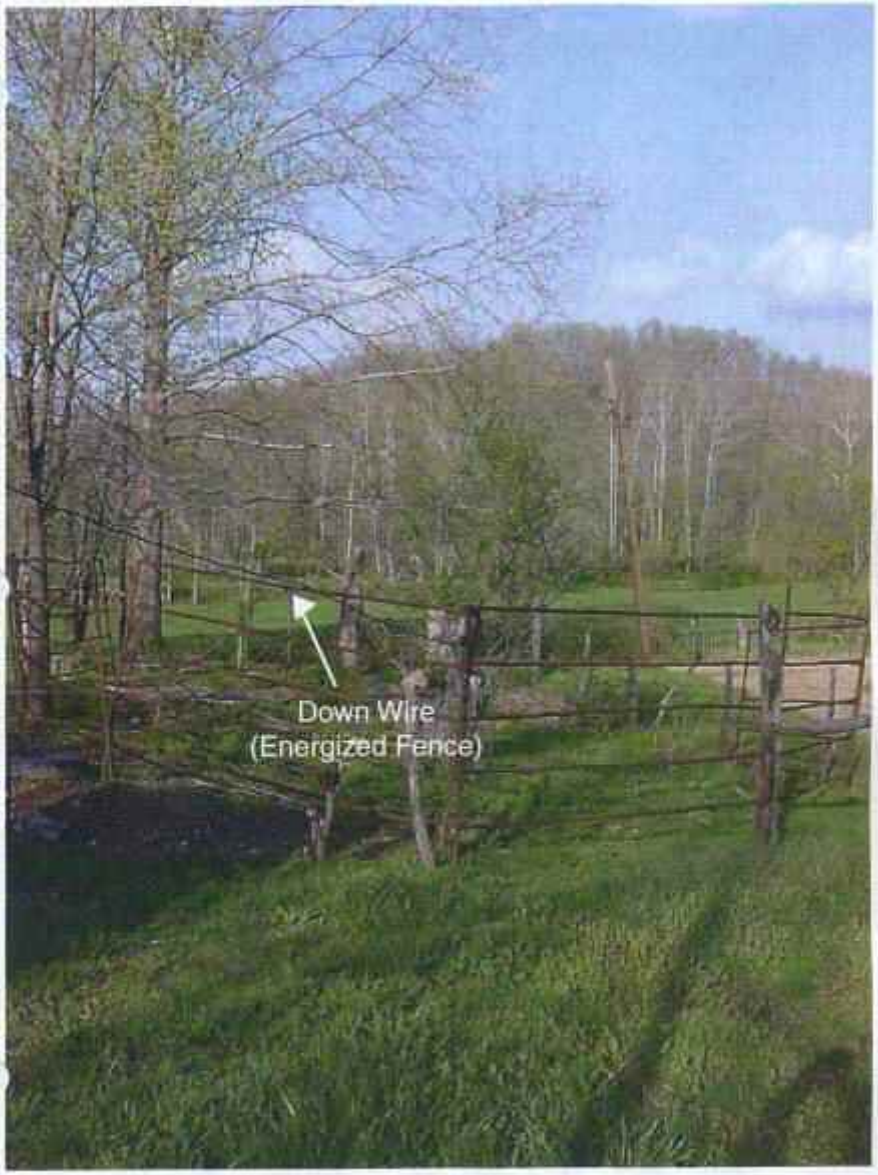

Frayed
Primary Wire

Woodpecker Damage

Pileated Woodpecker and damage caused by woodpeckers.


Rotten
Pole


Primary Wire
Loose From Pin



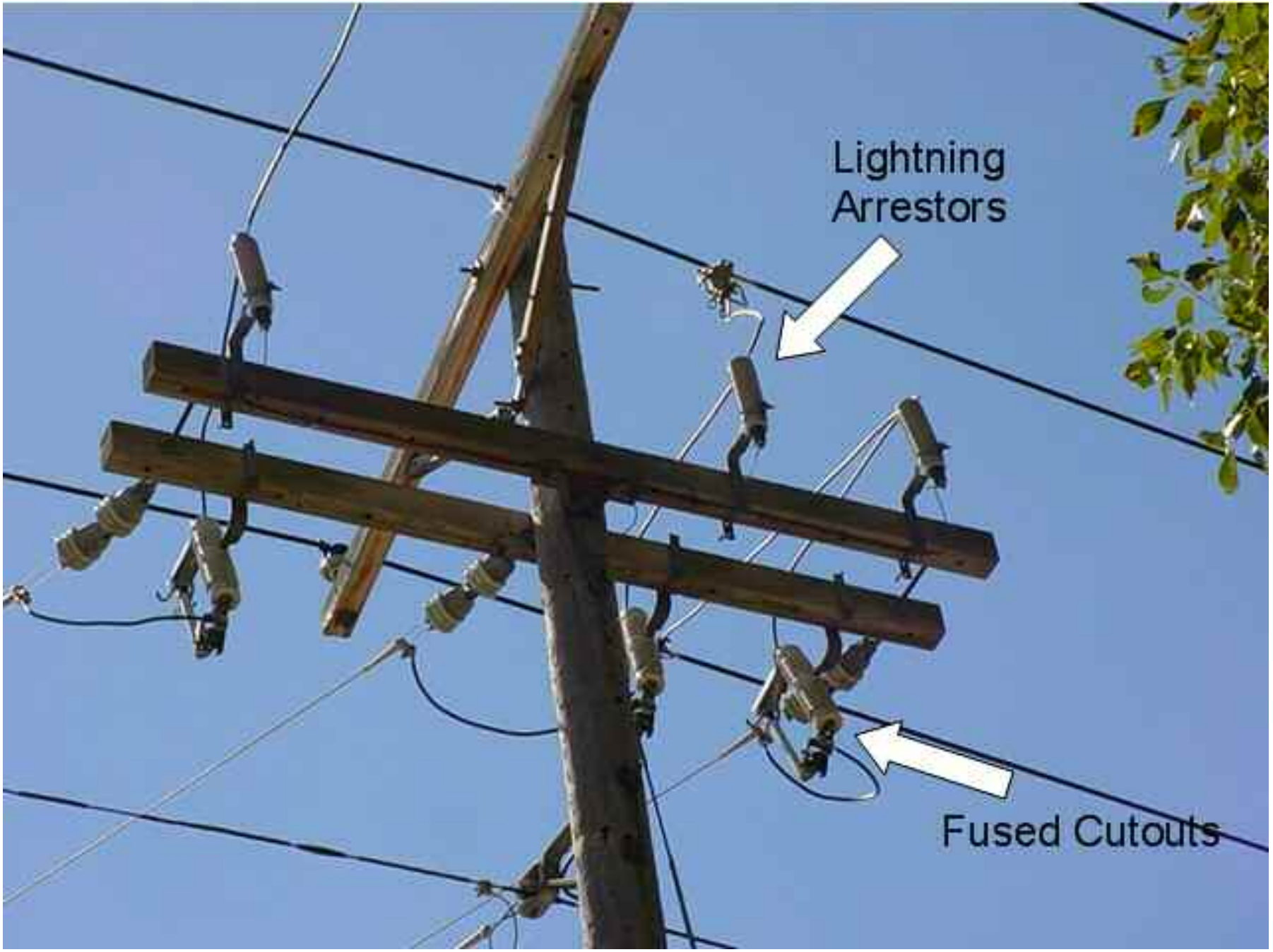
Transformer leaking oil


Damaged
Squirrel Guard
Damaged
Lightning
Arrestor
12 KV
Transformer

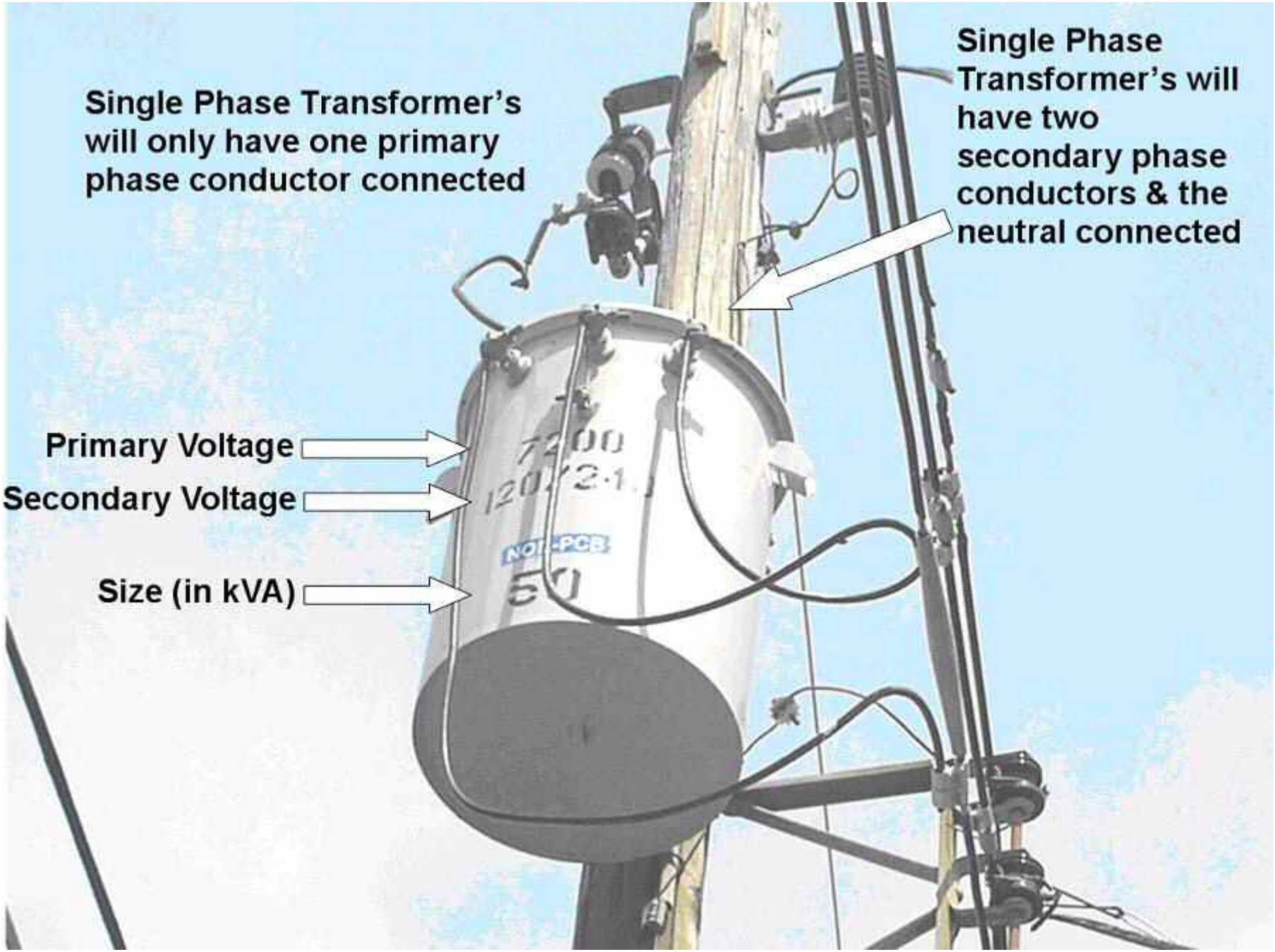

12KV
Transformer
Animal
Remains

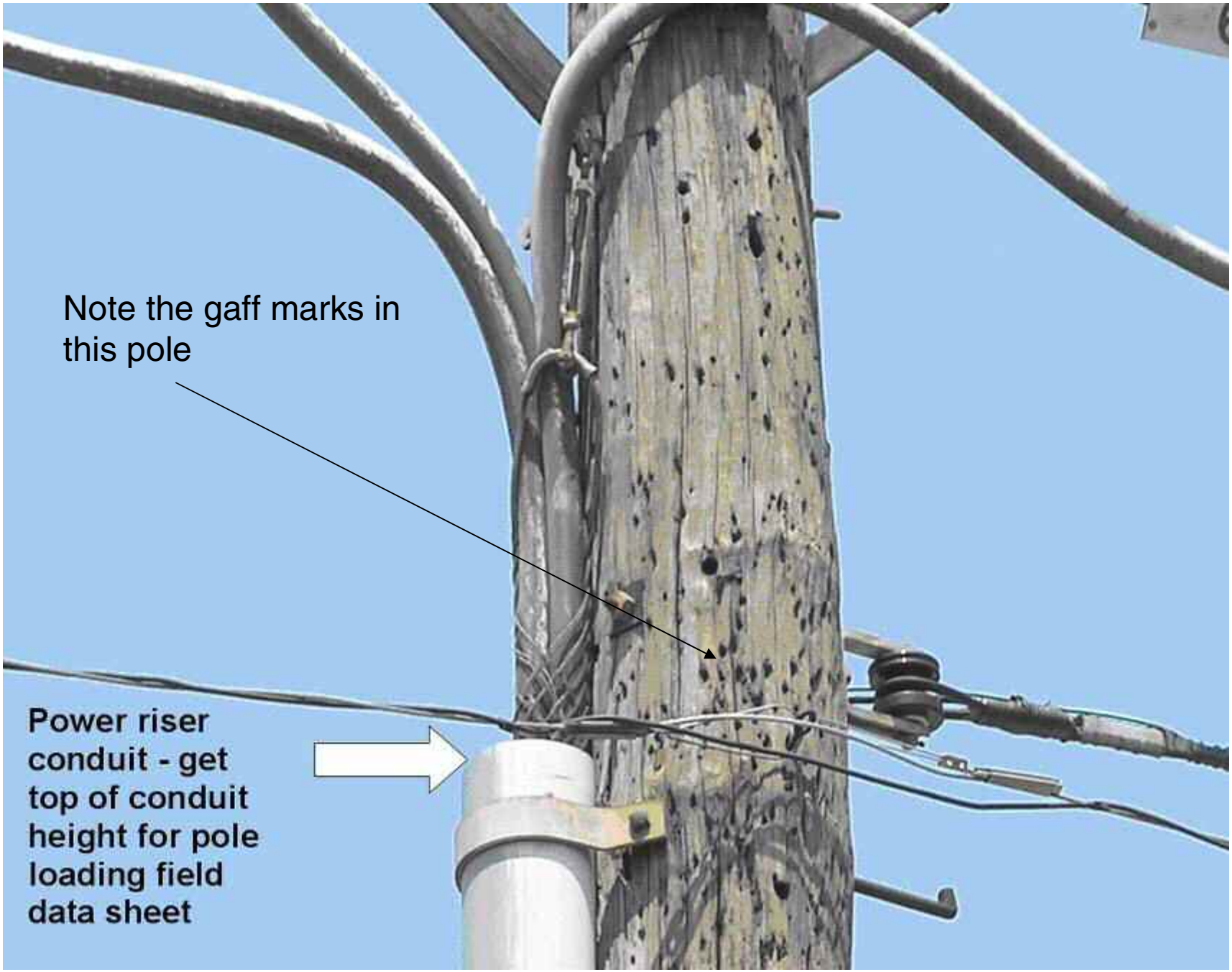

Steel Crossarms


Lightning arrestor

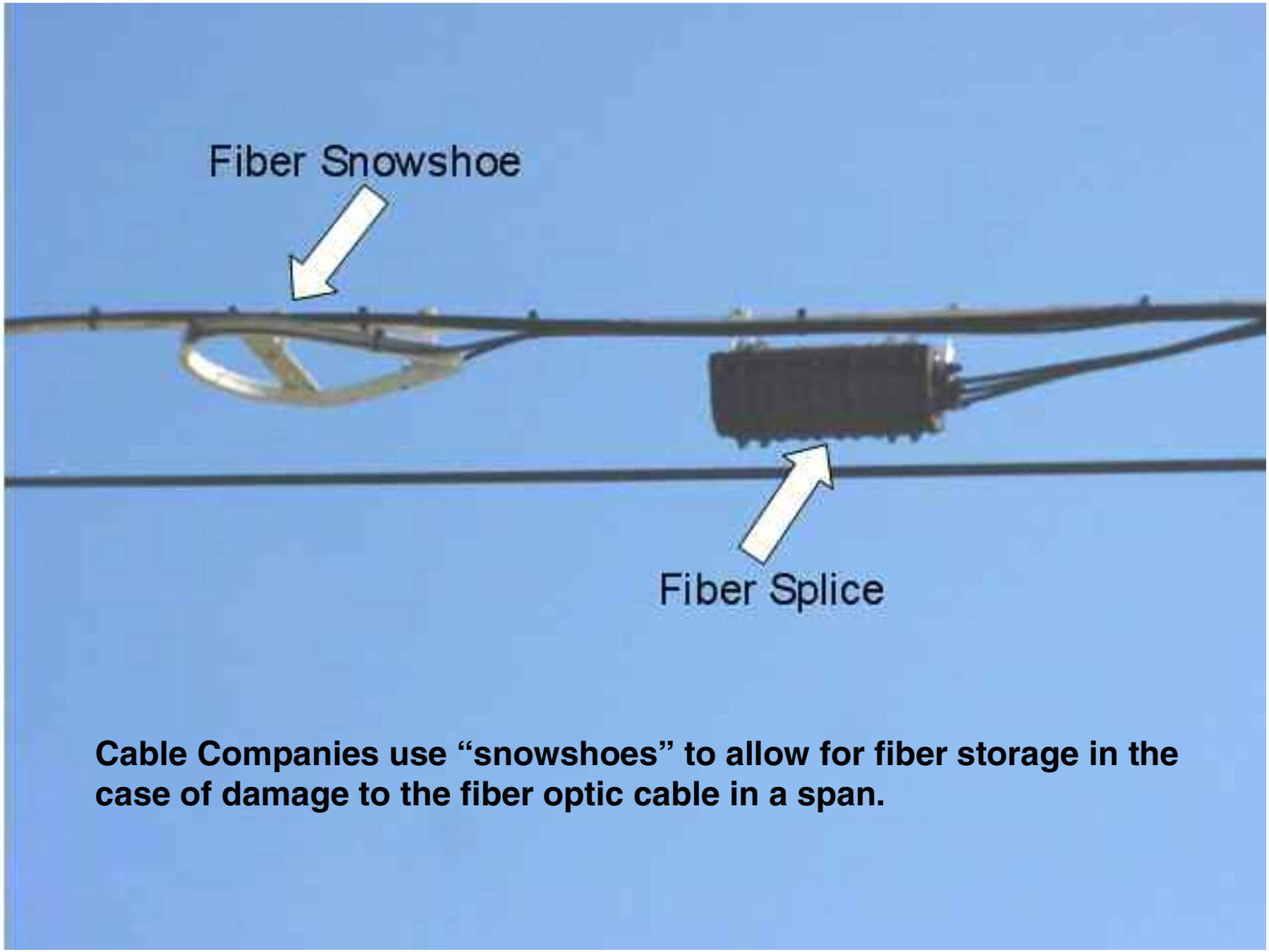

Lightning
Arrestors
Fused Cutouts


In-line Switches

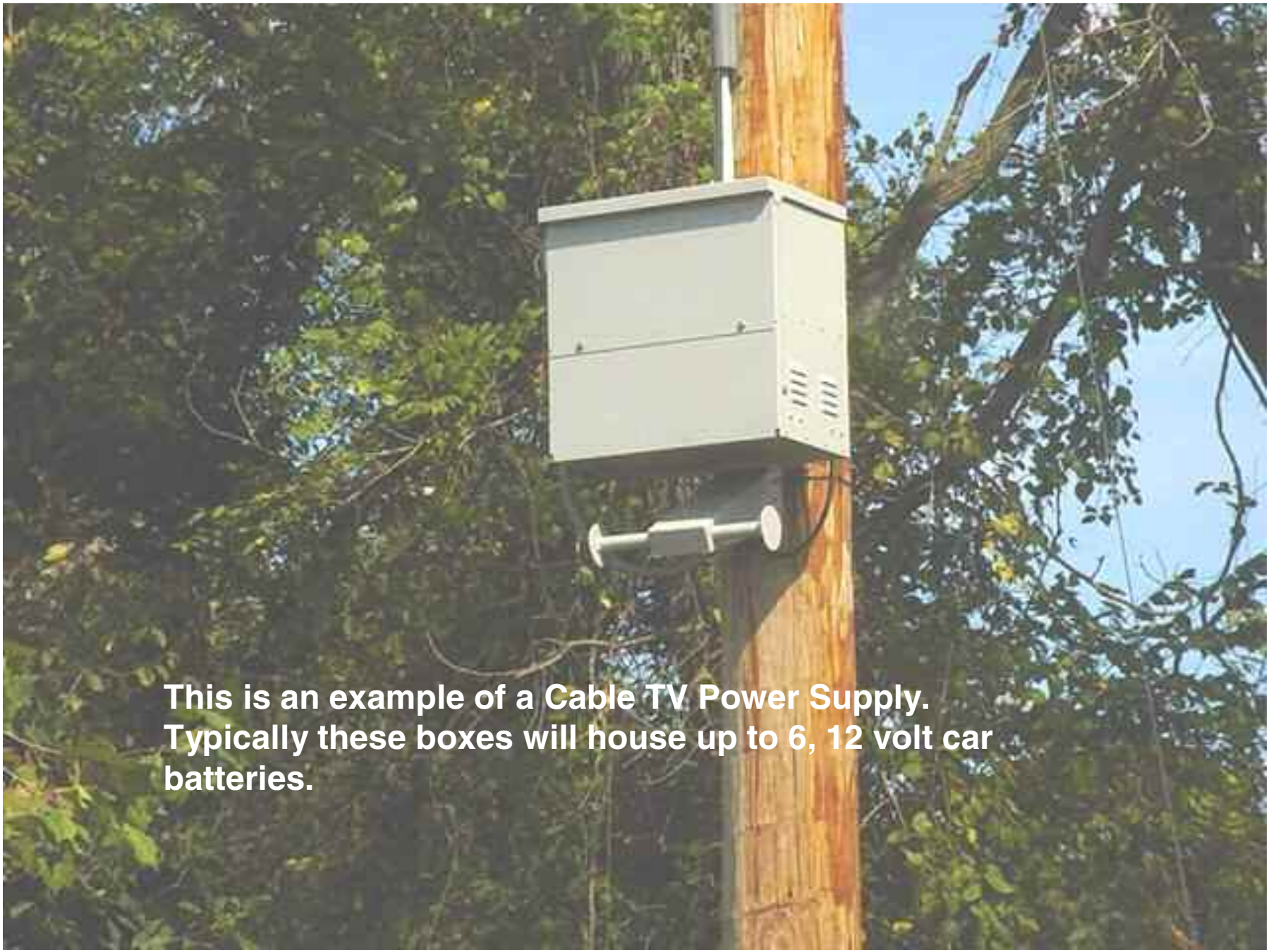

Single Phase Transformer's will only have one primary phase conductor connected
Single Phase Transformer's will have two secondary phase conductors & the neutral connected
Primary Voltage
Secondary Voltage
Size (in kVA)
7200
50


Note the gaff marks in this pole
Power riser conduit - get top of conduit height for pole loading field data sheet


CATV Cable
Phone Cables



Cable Companies use “snowshoes” to allow for fiber storage in the case of damage to the fiber optic cable in a span.



This is an example of a Cable TV Power Supply. Typically these boxes will house up to 6, 12 volt car batteries.


Cell-Net

Broken, loose guy wire

Automated Meter Reader