



# BREAKING DOWN INDUSTRY JARGON

We have received many nice compliments on this publication and we greatly appreciate them. Our goal in providing this magazine is to ensure you have information pertinent to the industry and to you as users of electricity. As we have noted in the past, we may write these center pages, but it really is Mary Erickson who takes the content we provide and makes it look like we know what we are doing. The purpose of these four center pages has always been to keep you, the member, informed as to what is happening at your cooperative, and the purpose of the magazine as a whole is to keep you informed as to what is happening in the industry and some of the things we are facing.

One comment we have received on numerous occasions is, “The articles are really good, but a lot of times I don’t understand what you mean with your terminology.” It is pretty easy, when you work with something every day, to just rattle on with nomenclature and terminology and not realize that someone might be reading with a bit of a blank stare.

We are going to start a series of “How Our System Works” and try and clear up some of the confusion.

To help correct this, we are going to start a series of “How Our System Works” and try and clear up some of the confusion...or, maybe not!

We provide generation reports to the U.S. Energy Information Administration each year regarding generation, consumption, fuel use, etc., and they have a relatively comprehensive website that would not hurt anyone to peruse at some point. Some of the graphics, etc., that we use are taken from there.

As a starting point, we have a graphic on page 17 that was created by a pole treatment company (and yes, some of our poles have their treatment) with a slightly edited description on page 16. In future editions, we will include some photos of the various pole configurations we have here on the Island and the purpose of some of the equipment we hang on them that is not included in this very well-done graphic.

Small cells installed on towers at Schoolhouse Beach (right, with light, emergency phone, public WiFi, and EV charger to come in spring) and in front of the cooperative building (overview) are improving cell service on the Island.



## SMALL CELL – BIG PROGRESS

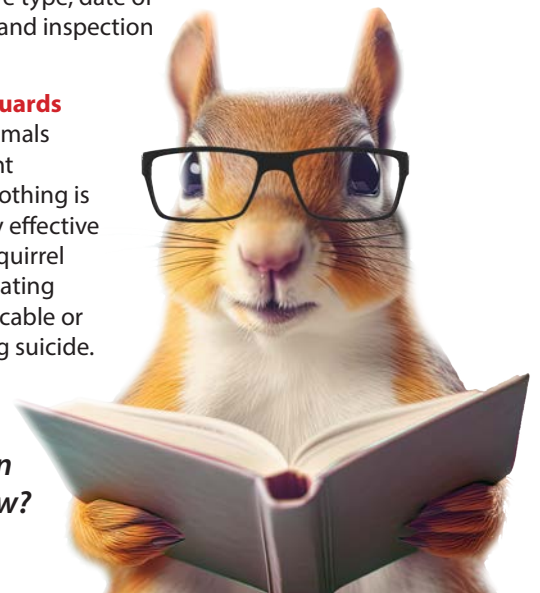
By the time you read this, Nsight will have activated two of four (possibly five) small cell sites here with our assistance, one at Schoolhouse Beach and one at the cooperative on the tower that once had the windmill on it. While I am calling these sites “small cell” sites, they are actually full-blown cell sites.

We have jokingly called the windmill our “seagull killer” for years and have now renamed the installation “seagull whisperer.” Yes you will no longer be able to use the useless wind generator to gauge the direction and speed of the wind, but you should be able to much more reliably access weather apps on your phone.

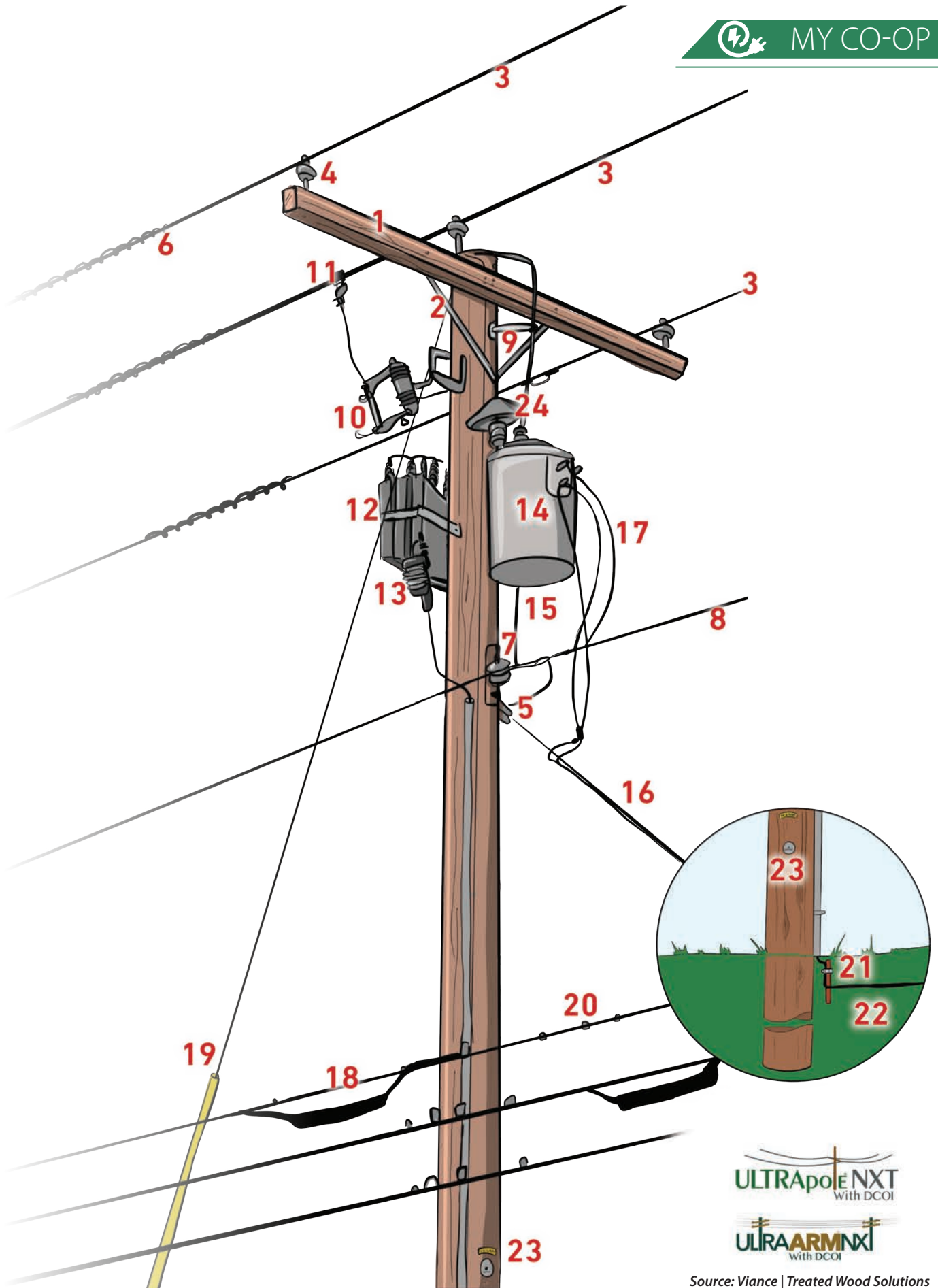
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# WHAT IS ON A UTILITY POLE?

1. **Crossarms** are available in treated wood, metal, or composite material such as fiberglass and are mounted to a utility pole to hold up the power lines and other electrical equipment.
2. **Crossarm Braces** support the crossarm(s) that hold the wires on multi-phase poles.
3. **Three-phase Primary Distribution Wires** usually carry 7,200 to 12,000 volts of electricity from the nearby substation to the transformer.
4. **Primary Insulators** are made of materials that do not conduct electricity to isolate high-voltage wires from the pole or crossarm and to prevent energized wires from coming in contact with each other or the utility pole.
5. **Secondary Insulators** are devices used to isolate the wire from the wood.
6. **Spiral Vibrator Dampers** reduce vibration in lines generated by wind. We currently do not have any of these in place; however, you will see some wing-type devices that accomplish the same thing.
7. **Secondary Rack and Wires** are used to support and isolate low-voltage wires from the pole.
8. **Neutral (Conductor) Wire** is below the transformer and acts as a line back to the substation and balances out the amount of electricity or load on the system, acting as a ground wire.
9. **Standoffs** keep the ground wire off primary and secondary wires and cables.
10. **Fuse Cutout** is a combination of a fuse and a switch, used in primary overhead feeder lines and taps, to protect distribution transformers from current surges and overloads. It acts as a fuse and opens when there is a problem with the line or section of it. In many of our installations, we simply have a tap line with a clamp.
11. **Line Tap** is a connection made to a distribution power line in parallel called a feeder. It might have some sort of fuse or breaker disconnect.
12. **Capacitor Banks** are commonly used to reduce the reactive power being supplied to the load due to the inductive nature of the power system. These banks most commonly will consist of a three-phase design where each phase has one to three units (three to nine units per bank). We do not have any of these on the Island; however, you will see them in other locations.
13. **Lightning Arrestor** protects the pole and equipment from lightning strikes. Because of our earlier Broadband over the Powerline project, you will see many of these that are hanging directly from the primary line and connected to the neutral.
14. **Single-phase Distribution Transformer (Step Down Transformer)** converts higher voltage electricity carried by primary wires to a lower voltage for use by customers.
15. **Ground (Conductor) Wire to Transformer Case** connects to the neutral wire to complete the circuit inside the transformer and runs the entire length of the pole to direct any electricity on the pole safely into the earth. We install a ground wire on every pole no matter what equipment is on the pole.
16. **Triplex Service Drop Cable (Secondary Power Lines)** carries secondary current, 120/240 volts, to the customer in two hot wires and one bare neutral wire connected to the ground wire on the pole.
17. **Secondary (Conductor) Wire** carries the lower voltage electricity after it passes through the transformer to the customer's meter.
18. **Telephone and Fiber Wires** are typically the lowest wires on the pole. Clearances above ground and between them and conductors is important.
19. **Guy Wires** help stabilize the utility pole by pulling in the opposite direction as a run of conductor.
20. **Compression Clamps** are used to bundle, clip, clamp, label, guide, and protect wires and cables.
21. **Ground Rod** grounds the wire in the earth.
22. **URD Riser** is the primary underground cable feeding the customer or in some cases is a transition point from underground primary conductor to overhead primary conductor.
23. **Pole Brandings and Tags** identify the pole manufacturer, length, classification or pole strength, wood species, preservative type, date of treatment and inspection dates.
24. **Squirrel Guards** protect animals and prevent outages. Nothing is completely effective against a squirrel intent on eating fiber optic cable or committing suicide.



*Did you learn anything new?*



Source: Viance | Treated Wood Solutions

# SQUIRREL REVENGE TERRORIST PLOT

You will recall the photo of the squirrel that caused an outage (and there have been a couple additional squirrel suicides since) in the last edition of these pages. Well, some of his family members decided to enact a revenge attack on the cooperative by chewing through some newly installed fiber optic cable on the North end of Main Road. This was not only difficult to find and repair, but once repaired, the little bugger struck again.

Years ago, the Town of Washington had a bounty on crows. After this unexpected debacle, the cooperative is considering a bounty on gray squirrels and perhaps we will serve Brunswick Stew at the next annual meeting.

All kidding aside, this is a further illustration of what we have been telling you all along. Every system is subject to some sort of failure. This one was a bit unexpected (in spite of the damage down the county early last year) and we are working at installing material that will discourage a repeat performance.



Squirrel mistakes 7200v conductor for tasty fiber and pays the price!

We also had a software failure that caused units to need to be repeatedly reset. While this was mostly out of our control (firmware in the equipment was inexplicably reverting to a previous version), it also illustrates that nothing is flawless. One thing you can be sure of though, we will tell you what is going on!



One of several spots squirrels chewed on the new fiber.

## Small cells

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These two installations, and the future installations at the Ferry Dock area and Jackson Harbor, will not only improve the spotty coverage (subject to the limitations of foliage in the summer) but will also provide an additional revenue stream for the cooperative as there is not only an additional metered service, but also access to our dark fiber, which has been and is being installed as part of the broadband project.

As of this writing, the Schoolhouse Beach site is active and engineering is working on final configuration, but service improvements from Mt. Misery to Gasoline Town and inland are already being seen. In Washington Harbor Proper, which generally had no service, four- and five-bar service is now pretty standard.

At the cooperative site, two of three sectors on the antenna array are active and improvement in the central part of the Island is already noticeable. The third sector was made operational later and while there still may be some ongoing adjustment, there is already a dramatic signal improvement.

These small cells are Cellcom and roaming partner carrier installations; however, no matter the carrier, you will always be able to use them for SOS or 911, which is obviously a big deal, especially at Schoolhouse Beach.

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