



# CURRENT COMMUNICATOR

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MEMBER NEWSLETTER OF CENTRAL VIRGINIA ELECTRIC COOPERATIVE

"Improving the quality of your life in a quietly impressive way."

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## YOUR OFFICIAL OUTAGE & RELIABILITY EDITION . . .



*... or  
everything  
you ever  
wanted  
to know  
about why  
the lights  
go out!*

### Normal life comes to a grinding halt when major weather events knock out electric service.

People immediately shift focus away from their regular activities to concentrate on the basics of life: heating or cooling, water, refrigeration, cooking,

bathing and other human needs. As a member-owned utility, day-to-day service reliability is a top priority for CVEC. While the cost of electric service is important, the cost of no electric service rises every day of an outage until service is restored.

In recognition of the importance of service reliability, CVEC has reorganized our engineering group and created a Reliability Department. This new department is charged with the mission of preventing outages when possible and reducing the impact and duration of outages when they do occur. Please take a few minutes to read this special Outage & Reliability edition of the **Current Communicator** and share your comments and suggestions at: [www.mycvec.com](http://www.mycvec.com).

**About Your CVEC Rural Distribution System:** The Co-op distributes power out of 30 substations in the rural portions of 14 counties across 4,500 miles of power line that includes 57,000 poles! That's an average of 13 poles and 8 members per line mile ... which compares to 35-50 customers per line mile for investor-owned (IOU's) and municipal utilities. The circuits that exit the substation are radial lines, meaning that they extend like tree branches and they carry 7,200 or 14,000 volts.

**Challenges Abound:** Unlike power lines on municipal and IOU systems, few circuits have alternate power feeds. So a power interruption at any given point will interrupt service for all members beyond that point until the fault location is cleared. Some areas have underground service, but most members are served by overhead lines that are subject to service interruptions as a result of downed trees, ice loading, animal contact, traffic accidents, or other causes.

In addition, compared to the compact areas of city-owned utilities, CVEC's members are spread out over rural terrain, increasing the response time for repair crews when outages do occur.

CVEC is also different from other areas of the country with rolling and mountainous terrain (unlike the Midwest) and significant tree coverage . . . both a challenge to service reliability, during warm weather when hurricanes and windstorm can down trees and during the winter when ice and snow can lead to outages. ♥



## WHAT CAUSES AN OUTAGE?

To understand why a power outage occurs, it is important to remember the nature of electricity . . . **it is always seeking a path to the ground.**

Utilities try to prevent that by keeping power lines elevated on overhead lines and isolated with ceramic or glass insulators, or by wrapping underground conduit in rubber coating.

All is well and service is reliable until electricity finds a path to the ground, perhaps with a tree making contact and providing a path through the wooden trunk, a line breaking and making direct contact with the ground, or even a squirrel or bird that

bridges the gap between the power line and a utility pole.



### *Isolating Outages:*

When a path to the ground occurs, a **fault** location is created, resulting in danger to anyone in the area and jeopardizing the distribution system.

To prevent fires and loss of life, CVEC has installed protective equipment along the power lines that de-energizes the line when a fault occurs. This is similar to the circuit breakers in your home that operate when there is a ground fault or overload situation.

- Each home or business on the CVEC system has a **fuse** on it's service transformer that will operate and isolate the individual service when necessary.
- The Co-op installs fuses at the point where tap lines take off from a primary circuit that will isolate a neighborhood or cluster of homes.
- The Co-op installs specialty equipment known as **reclosers** along the main circuits that will operate when a tree makes contact or another event causes a fault. More sophisticated than a simple fuse, the recloser will temporarily allow a section of the circuit to become de-energized,

breaking the arc possibly created when a tree branch or animal made temporary contact. The recloser will then attempt to re-energize the main line up to three times, thereby increasing the chances of maintaining service and avoiding the need for a crew to be dispatched to close a fuse. If the recloser fails after the third attempt, it will de-energize the entire line section beyond the protective equipment until the problem is located and repaired.

- **A SPECIAL NOTE:** If the fault is cleared, then members will only experience a “blink” or two, and suffer the inconvenience of resetting electronic clocks. While blinks may be an inconvenience, they are a much better alternative than an outage for 2-3 hours. ⚡





# WHAT'S MY CO-OP DOING TO PREVENT OUTAGES?

## *Rights-of-Way:*

**CVEC spent \$1.5 million last year on right-of-way management through a variety of methods.**

For overhead lines, the Co-op is permitted to maintain the area beneath the power line and 20 feet on each side, creating a 40-foot wide corridor along the primary circuits and tap lines.

- » Maintenance efforts include bush hogging and chain saw work.
- » In some areas, CVEC will apply a spray to the leaves of small saplings that impairs the sapling's ability to process nutrients, causing the root system to become inactive.
- » CVEC uses specialty land equipment and helicopters to trim lateral growth of branches from outside the 40-foot right-of-way.
- » CVEC does not maintain yard trees in the area along the member service line, the lower-voltage line that runs between the service transformer and the weatherhead attachment on the exterior of the home or business. Please know we are sensitive about operating heavy equipment on manicured lawns, over septic fields, and in close proximity to children and family pets. Upon request, CVEC will de-energize the member's service line if and when you schedule yard tree maintenance.
- » **SPECIAL NOTE:** CVEC does not chip tree branches. The Co-op and its contractors will clear large branches to the side of the right-of-way and will leave smaller branches in the right-of-way to be bush hogged at a later date.

**Pole Inspections:** Much of the distribution system has a life expectancy of 30-50 years. CVEC and its contractors schedule pole inspections and maintenance every 10 years, utilizing a hammer test and a drill bore at the pole base to verify that the pole is solid to the core. We also treat the pole bases if warranted or schedule a pole replacement if the



pole's condition indicates that it could break during a weather event.

**Reconductoring:** CVEC will replace the conductor along line sections if increasing the line's capacity for energy delivery or when the line has reached its life expectancy.



Trimming right-of-way with helicopter (*above*); blade that drops below and trims trees (*right*)

**Protective equipment:** Our engineers schedule reliability improvements in our construction work plan, adding protective devices and lightning arrestors to increase the number of line sections, and to reduce the impact of outages when they do occur.

**Danger Trees:** You can help your Co-op, family and neighbors by keeping an eye out for trees adjacent to the power line right-of-way that don't appear to be healthy and are likely to fall into the power line during heavy rain and high winds. Report a danger tree by calling **800-367-2832** or e-mailing [forester@mycvec.com](mailto:forester@mycvec.com). 📍



CVEC contract crews will be clearing right of way in the following areas:

- Tye River
- Schyuler
- Henson Store
- Redhill

# OUTAGES WILL HAPPEN!

## Despite the best maintenance program and reliability planning, outages will occur across 4,500 miles of distribution line.

In 2011, 46% of the **total outage hours** (701 outage events) were caused by a tree on the line that fell from outside of the ROW. Another 33% of outage hours (27 outage events) were caused by an interruption of the wholesale power supply to our substations, affecting many members. When we look at just the **total volume of outages**, trees falling from outside of the right-of-way is still the number one cause (701), followed by weather/lightning (370), and then animal contact (347 ... mostly by squirrels and snakes).

During major weather events, there may be many downed trees that need to be cleared in order to restore full service. To put this into perspective, during the Snowmageddon Storm of 2010, CVEC repair crews cut 2,500 trees away from our distribution lines. ♡

### WHAT SHOULD I DO TO WEATHER AN OUTAGE?

#### *Be prepared!*

- ✓ Battery-powered radio
- ✓ Flashlights & fresh batteries
- ✓ Emergency supplies of water
- ✓ Non-perishable, easily prepared foods
- ✓ Manual can & bottle openers
- ✓ Candles, matches/lighters
- ✓ Portable heater (gas or oil)
- ✓ Camping equipment
- ✓ Charged cell phone
- ✓ Cooler
- ✓ Blankets & pillows
- ✓ Cash
- ✓ Medications & personal hygiene products
- ✓ Non-cordless phone
- ✓ First-aid kit
- ✓ Pet supplies
- ✓ Fire extinguisher & smoke alarm
- ✓ Family & emergency contact list

#### *Be safe!*

- ✓ Don't operate lanterns, heaters or fuel-fired cook stoves without adequate ventilation.
- ✓ Always refuel appliances outside, away from flames or sparks. Wipe up fuel spills immediately.
- ✓ Do not burn charcoal indoors, because it releases carbon monoxide.
- ✓ Don't allow children to carry candles or oil lamps in the house.
- ✓ If you use a fireplace, use a screen. Do not leave a fire unattended, especially at night.
- ✓ If you use a generator, have it installed by a certified electrician and inspected by CVEC to prevent back feeding onto the distribution line and endangering our linemen and others.
- ✓ Remember to place the generator outside in a well-ventilated area.
- ✓ Shut off or unplug any sensitive electronic equipment to protect them from power surges.
- ✓ Eat to supply heat and drink to avoid dehydration.



## MY LIGHTS WENT OUT!

### Reporting an Outage:

Unlike the human body that reports an injury to the brain, the CVEC distribution system has few feedback mechanisms that will report the fault location to our dispatch center. As a result, the Co-op is dependent on members reporting outages:

- Members can call **800-367-2832** and, ideally, use our automated outage reporting system. If we have your phone number on record, our system will ask you to confirm the location and whether you want to report an outage. The system will also ask if you want a call back when we think that your service has been restored.
- When using the automated system, members may leave recorded messages regarding the location of trees on a power line, line on the ground, or other important information.



- Members with rotary dial phones should wait for the automated system to connect them to the next available representative. Another solution is to purchase an economical “princess style” phone that plugs directly into a telephone outlet but has push button capability.
- Members can visit [www.mycvec.com](http://www.mycvec.com) and report their outage online. The outage section also features a map that displays the number of outages by substation and by county.

- Members may speak to a CVEC representative or someone from our call overflow service who can manually enter your outage information. 📍

### What Happens to my Information?

- The details of each reported outage are entered into the CVEC Outage Management System, where they remain until they are cleared from the system by our dispatchers.
- The Outage Management System utilizes predictive analysis, combining the reported outages along a line section to determine where a fault location likely has occurred and where a recloser has operated.
- In addition to taking outage reports from members, field personnel will patrol circuits to conduct a damage assessment during major outages.
- With information in hand, crews are then dispatched to where they can do the most good, typically to the fault location closest to the substation. Once that fault location has been cleared and the necessary repairs made, then the crew will contact dispatch and attempt to re-energize the circuit.
- Power will either flow to the end of the circuit or to the next fault location where a protective device will operate. The Outage Management System will once again utilize predictive analysis and initiate an automated call to members who should have power restored. If members are still without power, they are encouraged to re-enter an outage report. 📍

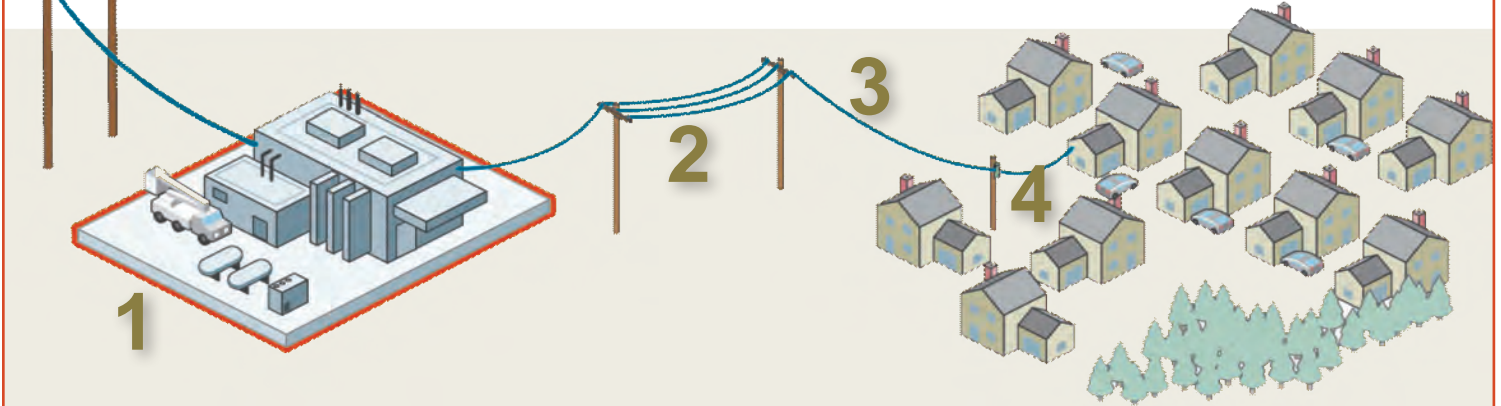
**Call 800-FOR-CVEC**

### Planned Outages:

As part of ongoing system improvement work, it is necessary on occasions to de-energize a line section. This often occurs when CVEC is upgrading from 7,200 volts to 14,400 volts or when safety considerations during repair work require it. CVEC will notify members by letter or by telephone in advance when possible, unless emergency repairs arise and prevent notification.



## WHAT SORT OF OUTAGE MIGHT I BE PART OF?



### 1. *Substation Outages:*

As a distribution Co-op, CVEC is dependent on the delivery of wholesale energy through the transmission systems of Appalachian Power and Dominion Virginia Power. During major outages and on other occasions, CVEC must await repairs to the transmission system before there is any opportunity to deliver power by way of the CVEC distribution system.

### 2. *Outages on Primary Circuits:*

Each substation has two or more three-phase circuits that serves as a primary distribution line.

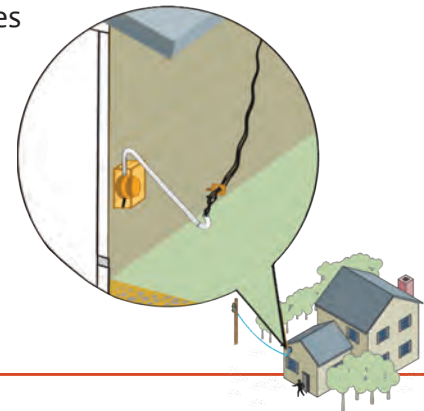
- ✓ The A, B, & C phase each carries energy and operates independently of one other, sometimes causing confusion for members along a line, where one phase may have tripped causing some member to be without power, while members on the other side of the street have lights.
- ✓ As mentioned earlier, faults are cleared starting at the substation and proceeding out toward the end of the primary circuit, a strategy that restores service to the most members as early as possible.
- ✓ Repairs along the main circuits may be time-consuming, often requiring the removal of damaged utility poles, setting new poles, attaching new cross arms and transformers, and removal of damaged conduit. During major events, the same process may be required a few miles further down line (away from the substation.)

### 3. *Single-Phase Feeders or Tap-Lines:*

These single-phase lines take off from the three-phase primary circuits to serve local neighborhoods and clusters of homes. As repair crews move along the primary circuits, some crews will check fuses at the head of each tap line and follow the single-phase lines to repair any damage along the line.

### 4. *Single Outages:*

The final step in restoring service during a widespread and extended outage is to restore service to individual homes or businesses. This may require simply closing a fuse or require chainsaw work and repairs to distribution equipment. ♡



## Things to keep in mind:

💡 CVEC crews will work as long as allowable each day and will restore service in an orderly manner, utilizing safe and effective work practices.

💡 CVEC will use contractors and visiting linemen who may travel from sister cooperatives once they know that their home system is not in jeopardy.

💡 During large outages, field personnel have specialized assignments. Some are clearing trees, others are patrolling lines or guiding visiting linemen, others are working on major circuits, while some crews may be focusing on single-phase lines. Division superintendents and our dispatch center are coordinating the field personnel, who may not be able to provide specific or comprehensive information to members.

💡 Adjoining homes may be fed from different power lines. Some members express concern when they notice that their neighbor's power has been restored, and then the repair truck departs. There is probably a known fault along the line that feeds the other homes in the neighborhood.

💡 Some members have alerted CVEC regarding their medical conditions. These members will be given preference when possible. As a practical matter, expediting power restoration is often not possible when multiple fault locations exist between the substation and the member's home. CVEC advises members with medical conditions to have a plan to relocate to an area with power in the event of an extended power outage. 📍

## WHEN? WHEN? WHEN?

Of course, the primary question that CVEC hears during an outage is:

### **When will my power be restored?**

Here are some guidelines:

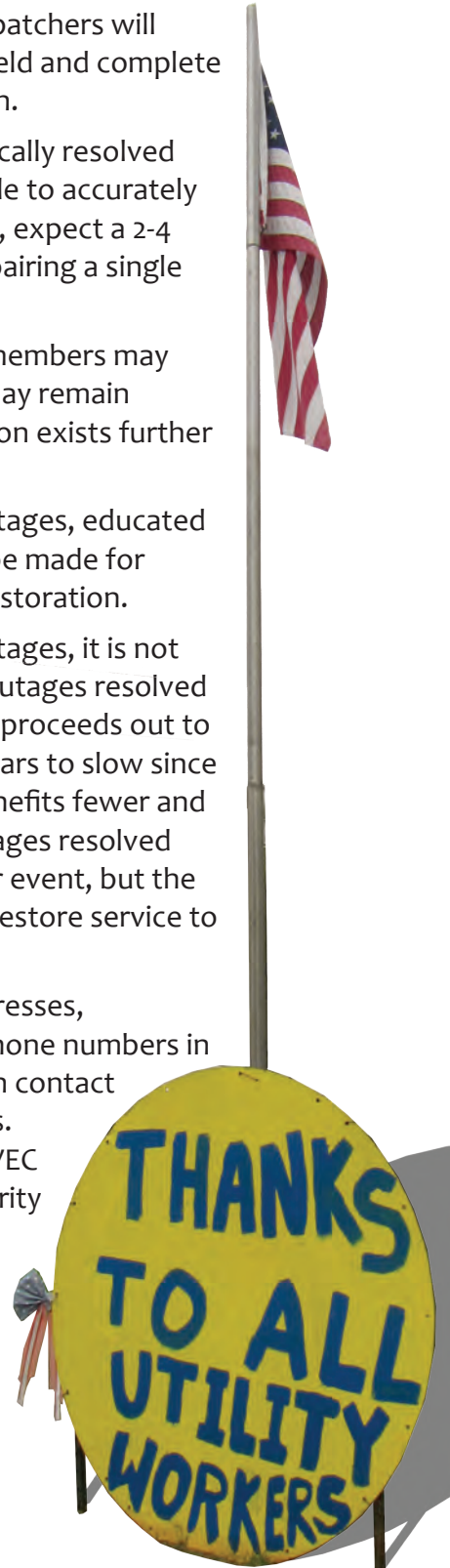
- ✓ Since there is little in the way of a feedback mechanism during repair efforts, dispatchers will know little until crews arrive in the field and complete repair work at the initial fault location.
- ✓ As a result, isolated outages are typically resolved before reliable information is available to accurately predict a restoration time. In general, expect a 2-4 hour time frame if all goes well in repairing a single site fault.
- ✓ Once the line is re-energized, some members may have power restored, while others may remain without power if another fault location exists further down line.
- ✓ During extended and widespread outages, educated estimations of restoration time can be made for substation areas and for complete restoration.
- ✓ During widespread and extended outages, it is not uncommon to see half of the initial outages resolved within 24 hours. As restoration work proceeds out to the single-phase lines, progress appears to slow since repair work at each fault location benefits fewer and fewer members. CVEC often has outages resolved within 5-7 days after a major weather event, but the final two days are often required to restore service to the last 10% of affected members.
- ✓ CVEC is actively gathering e-mail addresses, home telephone numbers and cell phone numbers in anticipation of the ability to remain in contact with members during power outages. As a member-owned Cooperative, CVEC always protects the privacy and security of your information.

**Please update your contact info:**

**800-367-2832**

or

**[www.mycvec.com](http://www.mycvec.com)**



[www.mycvec.com](http://www.mycvec.com)



## WHAT CAN YOU TELL ME?

**Your Co-op wants to provide the best available and accurate information about power restoration time without making unfounded guesses or over-promising.**

**Information during extended outages will include:**

1. Regular press releases to local television, radio, and newspaper media.
2. The CVEC website will feature regular updates during the outage event.

**[www.forcvec.com](http://www.forcvec.com)**

3. The CVEC outage map on the website will show affected areas and outage counts and will allow members to track the restoration process.
4. The CVEC Facebook pages has more than 1500 fans who follow updates, often on smart phones. They can ask general questions about our restoration process. Many share information with their neighbors and share news of local resources.

**[www.facebook.com/myCVEC](http://www.facebook.com/myCVEC)**

5. CVEC shares information with local government officials and emergency services coordinators. 📍

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