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EXECUTIVE VICE PRESIDENT'S *REPORT*

As we rapidly approach the close of 2009, it is not without wonder as to where the year went. And what a year it was! Business is still slow and the unemployment numbers continue to rise at an alarming rate. I know, from speaking to many of you over the past month's that layoffs have been heavy, work very slow and new government regulations are making it more and more difficult to generate a profit.

We are currently preparing FAEC for the 2010 membership year and do have some new and exciting things to share with you. First, FAEC is in the process of establishing a new Educational Foundation; a separate 501-C-3 organization whose sole purpose will be promoting our electrical contracting industry to new recruits from various areas of the market place. Our industry has a great deal to offer new, energetic individuals who are willing to work and make a commitment to a great career. In promoting this, we will be utilizing our established career path and developing promotional material and programs to present to high schools and vocational/technical colleges around the State. One of the things that have me so excited about this new Foundation is the outstanding Officer's who have chosen to champion this cause. We are still in need of another 3-5 Trustees for this first year term and I will be following up with many of you to secure commitments.

We have plans in place for almost all of our programming for 2010. A Spring Conference planned at the beautiful Hawk's Cay Resort on Duck Key in the Floida Keys and a Fall Conference at the Renaissance Resort at World of Golf Village in historic St. Augustine, Fl. We will be holding a golf outing at the World of Golf on the famous King and Bear course. Watch upcoming issues of the magazine for further information.

Remember, licenses renew prior to September 1, 2010 so, the Spring conference will be a great place to earn some C.E. There's also some talk about a fishing tournament??? More to follow.

Committees, while greatly improved with new participation over the past year, still could use some help. We've been trying to get a professional development committee together who's sole purpose would be to generate material for our new Technical Bulletins which we hope to e-mail to all members after the first of the new year. If you have a technical interest, of any sort, we invite you to get involved. We need Code articles, management tool articles, and technical articles – of any sort. Please call the office if you have some material you wish to share. We could use your help!

In closing, as we do approach the year-end, I want to take this opportunity to wish you all a very happy holiday season and hope that the new year brings prosperity to us all.

Happy Holidays

- Janice Ficarrotto

FAEC BENEFITS OF MEMBERSHIP INCLUDE:

- A Voice in the Legislative Process through a lobbyist in Tallahassee.
- An Annual 'Spring Conference" & "Fall Convention" offering Continuing Education classes relative to license renewal.
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- The opportunity to interact with fellow contractors to share industry concerns and discuss industry news.

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GROUNDING VERSUS BONDING

By Mike Holt, NEC Expert

Part 12 of 12:
Communications Systems

How do you make communications systems safe?

So, it's late Friday afternoon and you're looking forward to the weekend. After working hard all week, you are thinking about what you'll be doing in—you check your watch—one hour. Suddenly, the ringing of your cell phone jars you out of your thoughts.

After a brief conversation, you know you can forget about your weekend plans. Smoke pouring out of the server room is not a good sign. Worse, the news that Frank is on his way to the hospital after simply touching a communication cable has your stomach in knots.

This doesn't sound like a good situation, does it? Unfortunately, many facilities—office, home, and residential—contain NEC Chapter 8 violations that could result in exactly this scenario. Or worse.

NEC Chapter 8

Some years ago, Sprint changed their installation requirements to mandate bonding their ground rod to the main bonding jumper (Randy Schmisny, former Chair of the IEEE Kansas City Section, helped bring this change about). Sprint's previous stance was that their ground rod should be "separate from" the power ground rod—and this was costing them money.

Their new policy made their installations comply with Article 250 and Chapter 8. The impetus wasn't pressure to comply with the NEC but the need to prevent equipment failures and reduce service calls. Bonding their electrode to the rest of the system provided cost-savings through increased reliability, performance, and safety. Comply with NEC Chapter 8, and you can enjoy those same benefits.

NEC Chapter 8 contains the requirements for communications circuits (Article 800), Radio and Television Equipment (Article 810), Community Antenna Television (CATV) and Radio Distribution Systems (Article 820), and Network-Powered Broadband (Article 830).

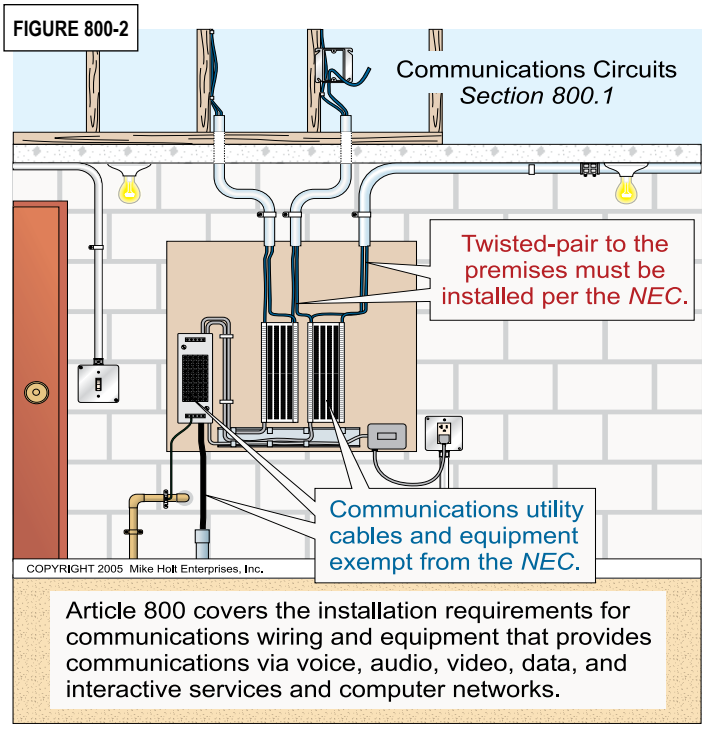
Articles 800, 820, and 830 are about the same size.

They have the same layout and other similarities. But Article 810 is less than half the size of these others and has its own structure. From a grounding and bonding standpoint, these Articles have the same goals—the primary one being to eliminate differences in potential. The grounding and bonding rules in these Articles often differ in the details. For example, you'll find differences in the minimum conductor size and whether you need an insulated grounding conductor.

Where we get twisted

The telco typically provides the twisted-pair cable to a terminal board at the structure. This terminal board is the Network Interface Device (NID). Article 800 addresses twisted-pair wiring from the NID to the premises **(Figure 800-2)**. We find this kind of wiring in such central station systems as fire and burglar alarm, telephone, and telegraph.

FIGURE 800-2



A primary protector is a device that protects installers and occupants from electric shock. You need a listed primary protector for each incoming communications circuit [800.90(A)]. The point of entrance is where the cable enters the structure or grounded raceway. Install the primary protector as close as practicable to the point of entrance [800.90(B)]. This practice reduces differences in potential between communications circuits and other metallic systems and objects. Those differences create personnel hazards and can lead to catastrophic failures—especially when lightning is present.

If you're installing phone cable, ground the metallic sheath (or interrupt it by an insulating joint) as close as practicable to the point of entrance [800.100]. This rule applies to other types of cable covered by Articles 810, 820, and 830.

Four other rules apply universally, as well:

- Keep grounding wires as short as practicable, and run them in a straight line. Why does this matter? Lightning tends to not to travel through sharp bends, corners, and loops. Instead, it tends to jump across them or flash over to something nearby.
- As common sense suggests, you must protect the grounding conductor where it is subject to physical damage—and that typically means you run it in a raceway. If you use a metal raceway, bond each end of the raceway to the grounding conductor.
- Ground cables and metallic raceways as close as practicable to the entrance point.
- Use only grounding conductors, connectors, and fittings listed as suitable for the purpose.

Grounding conductor

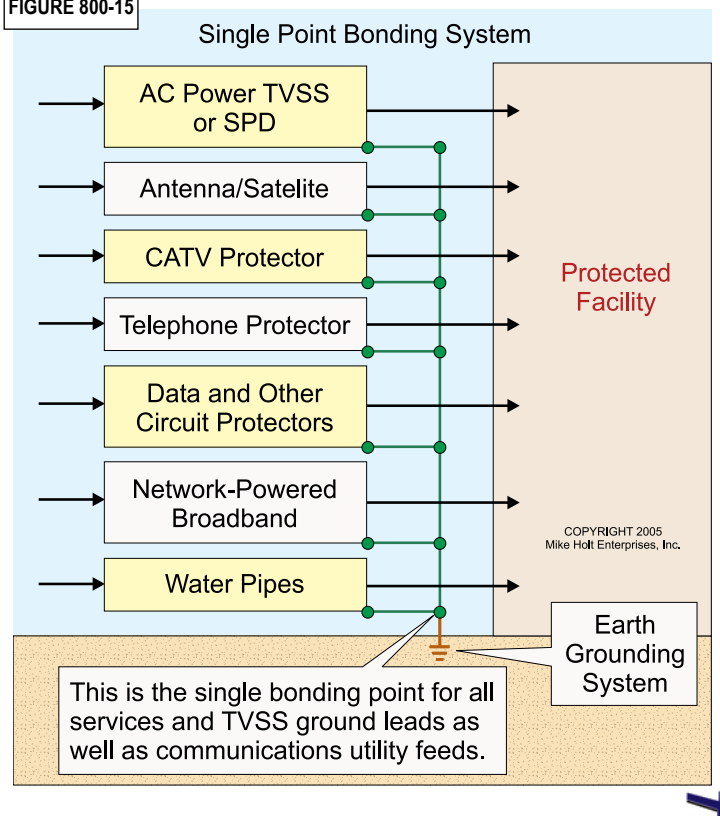
Article 800 requirements for grounding the phone cable and the primary protector are nearly identical to those of the other Chapter 8 Articles. The grounding conductor [800.100(A)] must be:

- Insulated and listed as suitable for the purpose (Article 810 does not require insulation).
- Copper or other corrosion-resistant conductive material (Article 810 has more stringent requirements).
- Not smaller than 14 AWG (this differs in the other Articles).
- As short as practicable. In 100(A), Articles 800, 820, and 830 contain a length limit of 20 ft for dwelling units. Article 810 does not contain a length limit.

Sometimes, it isn't practicable to limit the grounding conductor to 20 ft. Note the exception in 100(A)(4) of the appropriate Article. The details differ slightly, but essentially you can drive a separate ground rod that you must bond back to the grounding conductor.

Though the details differ among the Articles, the requirement to bond all external (entering a structure) systems (e.g., communications and power) to a single point remains. This practice minimizes the possibility of equipment damage—and electric shock—due to differences of potential between the systems **(Figure 800-15)**. If you don't make this bond, your system will be at risk for flashover, ground loops, power quality problems, and circulating currents. This is why someone can die from shock by merely touching the shield of the network cable on the back of a printer—even though all systems are properly "grounded." Maybe size doesn't matter, but bonding does.

FIGURE 800-15



Communications electrodes

If the structure has a grounding means, you have several grounding conductor termination options. Terminate to the nearest accessible point of the following locations:

- Grounding electrode system [250.50].
- Interior metal water piping system, within 5 ft from point of entrance [250.52(A)(1)].
- Service bonding means [250.94].
- Metallic service raceway.
- Service equipment enclosure, or
- Grounding electrode conductor (or GEC metal enclosure).

In the rare case that the structure lacks a grounding means, install a ground rod not less than 5 ft long and ½ in. in diameter [800.100(B)(2)(2), 830.100(B)(2)(2)]. For 810 and 820 installations, use a 10 ft rod per 250.52, or bond to the grounded structure. Bond this to the grounding electrode system with a minimum 6 AWG conductor.

Article 810

This article differs markedly from the other Chapter 8 Articles. But it still requires you to reduce differences in potential. The difference is in the details of how you do that.

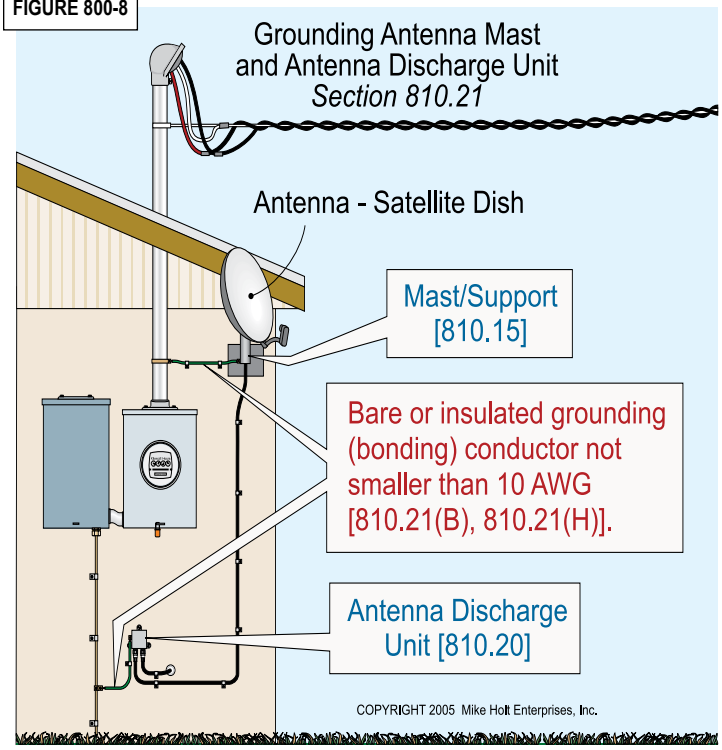
For example, you must provide a listed antenna discharge unit for each lead-in conductor from an outdoor antenna [810.20]. It doesn't matter if you locate the discharge unit inside or outside, but you must locate it nearest the point of entrance—and away from combustible material. If the antenna is indoors (e.g., in an attic), you can skip the discharge unit.

Ground the antenna mast and discharge unit per 810.21 (A) through (K) **(Figure 810-8)**. This grounding helps prevent voltage surges caused by static discharge or nearby lightning strikes from reaching the center conductor of the lead-in coaxial cable.

Satellite dishes provide additional challenges. Because the dish sits outdoors, wind creates a static charge on the antenna and attached cable. This charge can build up until it jumps across an air space—often passing through the electronics inside the low noise block down converter feed horn (LNBF) or receiver.

Manufacturers often mold copper-clad steel or bronze wire (17 AWG) into the jacket of the coaxial cable to eliminate the need for a separate ground wire—which simplifies grounding the satellite dish [810.21(F)(1)].

FIGURE 800-8



Avoiding confusion

To avoid Chapter 8 confusion, remember:

- Grounding and bonding requirements are in the same place in each Article (except for Article 810, which has its own structure).
- Make your grounding run short and straight.
- Focus on eliminating differences in potential.
- Use the Article for your specific installation.

Any time you work on a communications system, turn to Chapter 8. Bond to equalize potential, but ground to protect from lightning.

This is the final article in this series. If you've read them all, you now understand the difference between grounding and bonding—and the purpose of one vs. the other. By not confusing the two, you can eliminate some common causes of unsafe installations.

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