

Newsletter of:

The
Electrical Contractors Association
Of Tidewater



E.C.A.T.

A non-profit Trade Organization

Founded in 1954

1016 Green St., Norfolk, VA 23513

Phone: 757-855-0011

Our Mission is to provide Electrical Contractors & Tradesmen of Hampton Roads with a heightened awareness of growth in the electrical industry.

Officers & Directors

Steve Dawkins (Auxiliary Power)
President

Michael Hedrick (Freedom Electric)
Director

Melissa Seigmund (Levinsky Electric)
Vice-President

David A. Jernigan, Jr. (Jernigan Electric)
Director

Barry Basnight (J.B. Basnight & Son)
Treasurer

Scott Cole (Cole Electric)
Director

David S. Jernigan (All Trades of Tidewater)
Recording Secretary/Historian

Mark Sterns (Mark & Associates)
Director

ECAT meets on the Third Thursday of every month, September thru April at Soul Haven Hall, 1080 Aragona Blvd., Virginia Beach, VA 23455. Happy Hour starts at 6:30p.m. with the meeting starting at 7:00 p.m. till 9:00 p.m.

Contents

Presidents Message	Page: 3
Announcements	Page: 5
Web-Links	Page: 8
Code Corner	Page: 11
Business	Page: 16
Technology	Page: 21
Training	Page: 21
Finance	Page: 25
Safety	Page: 26
Health	Page: 28
Reflections	Page: 29
Lighter Side	Page: 29
Closing	Page: 30
Advertising	Page: 31

Events

Fundraiser

Spring Event 2012 Picnic

To Be Announced

Winter Event – 2012

To Be Announced

Charitable

Summer Event 2011 – Golf,

To Be Announced

Fall Event – 2011

To Be Announced

Editor's Message

I hope business is getting better or is at least sustaining for most of you. We have lost some good, long standing companies over the last year due to this tough economic time. It saddens me to see good people struggling so hard.

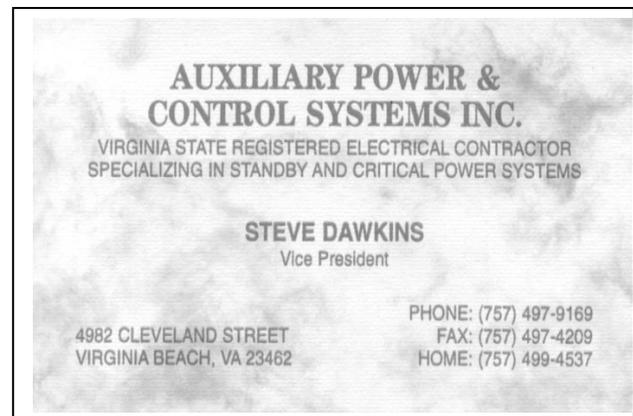
With summer approaching, good weather and a little luck, my hope is that things will improve. It's inevitable...what goes up, must come down and what goes down, must come up. I think it will be a long road to recovery but we must learn from the past and keep our heads in the wind. We must adapt and over-come.

I look forward to the new season of ECAT which will begin in September. Our membership drive month is August and I will be contacting members for renewal in July. If you are interested in becoming a member, go to our website at ecatva.com and register.

We also welcome your input on meeting topics or any concerns you may have that we, as group, might be able to help with.

Until then, best of wishes for the summer months

ECAT members and Sponsors now have new business exposure through our Web and Yellow Page listings. For more information contact us at ecatva1@aol.com or call 855-0011. Membership drive is the month of August. Sign up before September to insure your company gets recognized as an ECAT member.



Gain exposure for your company or business by becoming an ECAT sponsor. We have many Sponsorship opportunities, all at very affordable prices. Call 757-855-0011 for type sponsorships and details. Visit our website at ecatva.com to learn more about ECAT.



SCOTT F. COLE
President

24 Hour Service

COMMERCIAL
AND
RESIDENTIAL

COLE
ELECTRIC INC.

919 N. Great Neck Rd., Va. Beach, VA 23454
(757) 498-2653 498-COLE

J. B. 475-0118 * Beeper * BARRY 475-0119

J. B. BASNIGHT & SON
ELECTRICAL CONTRACTOR, INC.

1220 S. Military Highway * Chesapeake, VA 23320
757-420-3921 * 420-1811 * FAX 424-6235

FREEDOM
ELECTRIC

Commercial Residential

Michael Hedrick

Office 757-485-8770
Fax 757-485-8772 **Mobile 757-681-0971**



All Trades
OF TIDEWATER

A Full Service Business
Specializing in Commercial & Residential
Construction and Repairs

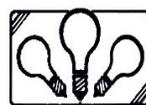
D. S. Jernigan Norfolk VA Beach
President **855-0011** **460-6365**

Mark & Associates, Inc.

ELECTRICAL CONTRACTORS

3110 ARIZONA AVENUE
NORFOLK, VIRGINIA 23513
(757) 853-9404
FAX (757) 853-8149
www.markandassoc.com

MARK A. STEARNS
PRESIDENT



Electrical Problem? (Emergency Serv.)
"Don't Rave, Call Dave"

Deal Direct With Owner
DAVID A. JERNIGAN, JR.
Electrical Contracting
Breaker Boxes & Lighting
(757) 460-6060
30 Yrs Exp.

MIKE LEVINSKY



ELECTRICIAN
LICENSED & BONDED

(757) 486-7349 704 PINETREE DRIVE
(757) 486-2375 FAX VIRGINIA BEACH, VA 23452

B. H. DAVENPORT
ELECTRICAL SERVICE
"For all your electrical needs."

PHONE ANSWERED 24 HOURS
(757) 587-6221
FAX (757) 480-2296
Email: barrytheelectrician4u@cox.net
FEDERAL ID 54-1136982 STATE LIC. 2705-017429
DCJS LIC. #11-1738
7006 KIRBY CRESCENT • NORFOLK, VA 23505-4215

ANNOUNCEMENTS

We are currently under the 2008 code.

ECAT members and Sponsors now have new business exposure through our Web and Yellow Page listings. Sign up now to insure your company gets recognized as an ECAT member.

TRADESMAN CONTINUING EDUCATION REQUIREMENTS

Effective with licenses that expire in 2008 and after, as a condition of renewal, all individuals holding a journeyman or master tradesman license will be required to complete a continuing education course in each discipline in which they hold a license. For example, an individual holding a master electrician license will be required to complete an approved electrical continuing education course. An individual holding a master electrician and master plumbing license will be required to complete an approved continuing education course in electrical and plumbing. For the trades of plumbing, electrical and HVAC the course must be three hours in length and for gas-fitting, natural gas and liquefied petroleum gas, one hour each. The continuing education must be completed prior to the expiration date on your license.

Currently, all Certified Elevator Mechanics must complete eight hours of continuing education, from courses approved by the Board for Contractors, as a prerequisite for renewal of their certification. Continuing education from NEIEP and CET level courses have been approved by the board, however, electronic reporting is still sporadic, requiring that you provide a copy of your training certificate along with your renewal card.

ALL continuing education courses must be approved by the Board for Contractors in order for them to be used as part of the renewal requirements. [Click here for a list of approved providers in PDF Format](#). This list is amended regularly as courses and providers are added and removed, therefore, you should check the list prior to scheduling your training class.

You should review the education requirements contained in the Boards regulations. Please do not hesitate to contact the licensing staff at (804) 367-8511 for any questions you may have regarding your license.

Note: The Electrical Contractors Association of Tidewater (ECAT) will be holding classes semi-annually to meet this need. Next class is scheduled for the last Thursday in February, 2010. If you are interested, contact us ecatva1@aol.com or by calling 757-855-0011

NY Times: NEW DELHI — It had all the makings of a disaster movie: More than half a billion people without power. Trains motionless on the tracks. Miners trapped underground. Subway lines paralyzed. Traffic snarled in much of the national capital.

On Tuesday, July 31, 2012, [India](#) suffered the largest electrical blackout in history, affecting an area encompassing about 670 million people, or roughly 10 percent of the world's population. Three

of the country's interconnected northern power grids collapsed for several hours, as blackouts extended almost 2,000 miles, from India's eastern border with Myanmar to its western border with Pakistan.

For a country considered a rising economic power, Blackout Tuesday — which came only a day after another major power failure — was an embarrassing reminder of the intractable problems still plaguing India: inadequate infrastructure, a crippling power

shortage and, many critics say, a yawning absence of governmental action and leadership.

India's coalition government, battered for its stewardship of a wobbling economy, again found itself on the defensive, as top ministers could not definitively explain what had caused the grid failure or why it had happened on consecutive days. Theories for the extraordinarily extensive blackout across much of northern India included excessive demands placed on the grid from certain regions, due in part to low monsoon rains that forced farmers to pump more water to their fields, and the less plausible possibility that large solar flares had set off a failure.

By Tuesday evening, power had been restored in most regions, and many people in major cities barely noticed the disruption because localized blackouts are so common that many businesses, hospitals, offices and middle-class homes have backup diesel fuel generators.

But that did not prevent people from being furious, especially after the government chose Tuesday to announce a long-awaited cabinet reshuffle — in which the power minister was promoted to take over the Home Affairs Ministry, one of the country's most important positions.

"This is a huge failure," said Prakash Javadekar, a spokesman for the opposition Bharatiya Janata Party. "It is a management failure as well as a failure of policy. It is policy paralysis in the power sector." For millions of ordinary people, Tuesday brought frustration and anger; for some, there was fear. As nighttime arrived, Kirti Shrivastava, 49, a housewife in the eastern city of Patna, said power had not been restored in her neighborhood. "There is no water, no idea when electricity will return," she said. "We are

really tense. Even the shops have now closed. Now we hope it is not an invitation to the criminals!"

Tuesday also brought havoc to India's railroad network, one of the busiest in the world. Across the country, hundreds of trains were stalled for hours before service resumed. At the bustling New Delhi Railway Station, Jaswant Kaur, 62, found herself stranded after a miserable day. Her initial train was stopped by the power failure. By the time she reached New Delhi, her connecting train was already gone.

"Now my pocket is empty," she said. "I am hungry. I am tired. The government is responsible." Sushil Kumar Shinde, the power minister, who spoke to reporters in the afternoon, did not specify what had caused the grid breakdown but blamed several northern states for consuming too much power from the national system.

"I have asked my officers to penalize those states which are drawing more power than their quota," said Mr. Shinde, whose promotion was announced a few hours later.

Surendra Rao, formerly India's top electricity regulator, said the national grid had a sophisticated system of circuit breakers that should have prevented such a blackout. But he attributed this week's problems to the bureaucrats who control the system, saying that civil servants are beholden to elected state leaders who demand that more power be diverted to their regions — even if doing so threatens the stability of the national grid.

"The dispatchers at both the state and the regional level should have cut off the customers who were overdrawing, and they didn't," Mr. Rao said. "That has to be investigated."

India's power sector has long been considered a potentially crippling hindrance to the country's economic prospects. Part of the problem is access; more than 300 million people in India still have no electricity.

But India's power generation capacity also has not kept pace with growth. Demand outpaced supply by 10.2 percent in March, government statistics show. In recent years, India's government has set ambitious goals for expanding power generation capacity, and while new plants have come online, many more have faced delays, whether because of bureaucratic entanglements, environmental concerns or other problems. India depends on [coal](#) for more than half of its power generation, but production has barely increased, with some power plants idled for lack of coal.

Many analysts have long predicted that India's populist politics were creating an untenable situation in the power sector because the government is selling electricity at prices lower than the cost of generating it. India's public distribution utilities are now in deep debt, which makes it harder to encourage investment in the power sector. Tuesday's blackout struck some analysts as evidence of a system in distress.

"It's like a day of reckoning coming nearer," said Rajiv Kumar, secretary general of the [Federation of Indian Chambers of Commerce and Industry](#).

India's major business centers of Mumbai, Bangalore and Hyderabad were not affected by the blackout, since they are in the southern and central parts of the country that proved to be immune from the failure.

[Phillip F. Schewe](#), a specialist in electricity and author of the book "The Grid: A Journey Through the Heart of Our Electrified World," said the demand pressures on India's system could set off the sort of breakdown that occurred on Tuesday.

In cases when demand outstrips the power supply, the system of circuit breakers must be activated, often manually, to reduce some of the load in what are known as rolling blackouts. But if workers cannot trip those breakers fast enough, Mr. Schewe said, a failure could cascade into a much larger blackout.

Some experts attributed excessive demand in part to the lower levels of monsoon rains falling on India this year, which have reduced the capacity of [hydroelectric](#) power and forced many farmers to turn to electric pumps to draw water from underground.

It was unclear how long it would take to restore power fully in areas still lacking it — or if the problem would recur this week. In Lucknow, capital of India's most populous state, Uttar Pradesh, Dr. Sachendra Raj said his private hospital was using two large rented generators to power air-conditioners and dialysis machines.

"It's a very common problem," he said of power failures. "It's part and parcel of our daily life."

Meanwhile, about 200 coal miners in the state of West Bengal were stranded for several hours in underground mines when the electricity to the elevators was shut off, according to reports in the Indian news media.

"We are waiting for the restoration of power to bring them up through the lifts, but there is no threat to their lives or any reason to panic," said Nildari Roy, an official at Eastern Coalfields Ltd., the mine's

operator. Most of the miners had been rescued by late evening, news agencies said.

Ramachandra Guha, an Indian historian, said the blackout was only the latest evidence of government dysfunction. On Monday, he noted, 32 people died in a train fire in Tamil Nadu State — a reminder that the nation's railway system, like the electrical system, is underfinanced and in dire need of upgrading.

“India needs to stop strutting on the world stage like it’s a great power,” Mr. Guha said, “and focus on its deep problems within.”

Reporting was contributed by Heather Timmons, Sruthi Gottipati, Niharika Mandhana and Hari Kumar from New Delhi; Vikas Bajaj from Mumbai, India; Raksha Kumar from Patna, India; James Glanz from New York; and Matthew Wald from Washington.



PHONE (757) 925-3606
CELL (757) 274-1908
MEDIA: (757) 925-2584

NORA CHIVERS
PIO, TRANSPORTATION OPERATIONS CENTER
Nora.Chivers@VDOT.Virginia.GOV

VIRGINIA DEPARTMENT OF TRANSPORTATION
PUBLIC AFFAIRS OFFICE, 1700 N MAIN STREET, SUFFOLK, VA 23434



Paulette M. Frantz
Trade Relations Specialist
Distribution Design

Dominion Virginia Power
2700 Cromwell Drive, Norfolk, VA 23509
Phone: 757-857-2024; Fax: 757-857-2717; Mobile: 757-353-7299
Toll Free: 800-827-7796; E-mail: Paulette.Frantz@dom.com

GuerrillaSocialMedia 

Damien Smith
Social Media Sensei
(757) 748-6856

www.GuerrillaSocialMedia.com
damien.smith@GuerrillaSocialMedia.com



Center for Real Estate
BNI AFFILIATE



Resource Lighting
Jesse James Jernigan
Specification Sales

4542 Bonney Rd., Suite A
Virginia Beach, VA 23462
Phone 757.456.5631
Fax 757.456.5631
Cell 757.620.4793

jernigan.jla343@lighting.net

Building Relationships First...

ALL TRADES

OF TIDEWATER

SPECIALIZING IN COMMERCIAL AND RESIDENTIAL
CONSTRUCTION AND REPAIRS

* ELECTRICAL

* PLUMBING

* MECHANICAL

* MASONRY

* BUILDING & CARPENTRY

* INTERIOR AND EXTERIOR
FINISHES

* REPAIRS OF ALL TYPES

* **Certified Lead Renovator**

* **COMMERCIAL TENANT BUILDOUTS**

* **Cat. 5 Certified Installer**

EMERGENCY SERVICE!

VISA

MasterCard

DISCOVER/NOVUS

***** ASK US ABOUT OTHER SERVICES *****

- PREVENTATIVE COMMERCIAL & RESIDENTIAL MAINTENANCE SERVICES
- TANKLESS WATER HEATERS
- NOTARY SERVICE
- UNDER-GROUND LINE LOCATION & REPAIR. BRANCH CIRCUIT TRACING
- INFRARED MOISTURE INSPECTIONS
- HOME INSPECTIONS
- BUILDING INSPECTIONS
- 3rd PARTY INSPECTIONS
- ENERGY AUDITS & RATINGS
- ENERGY CONSERVATION SYSTEMS
- SECURITY SERVICES
 - INTRUSION DETECTION
 - ELECTRONIC SURVEILLANCE
 - EMERGENCY & FIRE SYSTEMS
- EXPERT TESTIMONY
- GREEN ENERGY SAVING ALTERNATIVES
- RESTAURANT EQUIPMENT
- IRRIGATION & WELL DRILLING
- SIGNS – PAINTED, ELECTRICAL, VINYL
- LETTERING
- FLOORING
- GLASS REPAIR & INSTALLATION
- CABINETS & DISPLAYS
- HARDWOOD FLOORS
- REAL ESTATE SERVICES BUYING, SELLING, LEASING
- DECKING/FENCING
- ENGINEERING SERVICES

(757) 855-0011

WWW.ALLTRADESOF TIDEWATER.COM

WEB LINKS

The Hazards of Electricity – Do You Know What They Are?

The three main hazards of electricity are electric shock, electrical arc-flash, and electrical arc-blast. OSHA statistics show that several hundred deaths occur annually as a result of electric shock. This number has come way down since the introduction of GFCIs but is still a tragedy on an enormous scale. Studies also show that 10-15 employees are hospitalized every day with arc-flash burns. It is for these reasons that it is important that everyone understands the hazards of electricity.

Electric Shock

Electric shock occurs when a person's body completes the current path between two energized conductors of an electrical circuit or between an energized conductor and a grounded surface or object.

Electrical Arc-Flash

There seems to be a serious misconception in the industry that electrical arcs are a product of only high voltage. Actually, electrical arc-flash is not voltage sensitive but is more a product of short-circuit current and clearing time or arc duration. In some cases, it is possible to generate higher arc energy from a low-voltage source than from a high-voltage source. The amount of energy will in turn determine the temperature of the arc, which can reach 20,000 °K (Kelvin) or about 35,540 °F.

Electrical Arc-Blast

According to studies on the subject, the pressures from an arc are developed from two sources, the expansion of metal in boiling and vaporizing, and the heating of air by passage of the arc through it. Copper expands by a factor of 67,000 times when it vaporizes. This accounts for the expulsion of near-vaporized droplets of molten metal from an arc. These droplets can be propelled for distances of up to 10 feet (3 m). Plasma (ionized vapor) is also generated outward from the arc for a distance proportional to the arc power. One inch³ (16.39 cm³) of copper vaporizes into 1.44 yards³ (1.098 m³) of vapor. The air in the arc stream expands in warming up from its ambient temperature to that of the arc, or about 20,000 °K (35,540 °F). The arc-blast created by the heating of the air is similar in nature to the generation of thunder by the passage of lightning through it.

Go to the following link to read the full report presented at the 2006 IEEE IAS Electrical Safety Workshop, February 7-10, 2006, Philadelphia, Pennsylvania.

http://www.ewh.ieee.org/cmte/ias-esw/pdfs/Hazards_of_Electricity.pdf

DISCUSS VIOLATION PHOTOS with JOE TEDESCO

Joe is pretty good at finding interesting Pictures for discussion topics.
Stop by and take a look. Some of these photos are hard to believe!

www.Electrical-Contractor.net/Forum

Cooper Wiring Devices USB Duplex Tamper Resistant receptacle

Cooper Wiring Devices has debuted its USB Duplex Tamper Resistant (TR) receptacle, which it says replaces the standard AC duplex receptacle and eliminates the need for bulky adapters by offering two integrated USB ports. Suited for both commercial and residential applications, the receptacle is available in 15A and 20A.

<http://www.ebmag.com/Products/Wiring-Cabling-Devices/cooper-wiring-devices-usb-duplex-tamper-resistant-receptacle.html>

Promoting Yourself with YouTube

Remodelers are putting videos about their businesses up on YouTube.

<http://forums.jlconline.com/forums/showthread.php?t=49780>

The Uses and Benefits of Installing Shatterproof Lamps William & Patti Feldman

Shatterproof fluorescent lamps are well suited for use in food manufacturing, food processing plants, food preparation areas in restaurants where hygiene and safety are important, refrigerated and non-refrigerated areas of grocery stores, clean rooms, hospitals, medical labs, manufacturing and warehouse applications, industrial plants and distribution centers, facilities for technology development, and educational facilities. Use of shatterproof lighting is also mandated in elevators by the American Society of Manufacturing Engineers.

<http://www.electricsmarts.com/container.aspx?tab=featured&distid=19542&storyid=18411>

Commercial Load Calculations

http://ecmweb.com/mag/electric_commercial_load_calculations/

What's new at Arlington Industries?

<http://www.aifittings.com/>

CODE CORNER

Boxes, conduit bodies, and hand-hole enclosures - Based on the 2011 NEC

By Mike Holt for EC&M

Article 314 contains installation requirements for outlet boxes, pull and junction boxes, conduit bodies, and hand-hole enclosures. The specific conditions of use will often determine the type of box and installation methods required.

If you install a box in a wet location, for example, you must use a box, fittings and installation methods that are acceptable for wet locations. Fortunately, Article 314 helps you select the right outlet, device, and junction boxes—and size them properly.

As with any other Article, Part I provides the scope and general information. In Part II, we find installation requirements. Many of those, such as the

rule for repairing the surfaces of walls and floors around electrical boxes have changed.

Repairing noncombustible surfaces

The 2008 *NEC* changed 312.4 to require that noncombustible wall surfaces must be repaired if there are gaps or open spaces greater than 1/8 in. at the edge of a cabinet, cutout box, or meter socket enclosure. This differed from previous Code language, which mentioned only drywall, plasterboard, and plaster surfaces.

The 2011 revision changed 314.21 to mirror the language found in 312.4. Now 314.21 includes any noncombustible surface.

Gaps around boxes with flush-type covers that are recessed in noncombustible surfaces (e.g., plaster,

drywall, or plasterboard) must be repaired so there's no gap greater than 1/8 in. at the edge of the box [314.21].

Supported boxes

The allowance for a raceway-supported box or conduit body in 314.23(E) has been one of the more difficult rules for a Code user to read, due to the length of the rule and the number of technical requirements found in it. The exception for the support of conduit bodies has been equally difficult.

The 2011 revision to this section presents the exception in an easier to understand list format. It also names more types of raceways that can use this exception. For example, Type RTRC conduit has been added to the list in this exception [314.23(E) Ex].

Outlet boxes

The 2008 revision of the *NEC* significantly changed 314.27. Significant changes often bring numerous errors. The 2011 revision corrects an error in the previous *NEC* by requiring that boxes installed in a wall for luminaire support must be marked on the interior of the box to indicate the weight ratings of the box.

The 2011 revision also:

- Breaks up the requirements into a list format, for easier reading.
- Incorporates the provisions for lampholders into the title of the rule.
- Revises the luminaire box ratings for clarity and ease of reading

Ceiling fan boxes

Outlet boxes used as the sole support of a ceiling-suspended (paddle) fan must be listed and must be marked as suitable for this purpose. If the maximum weight isn't marked on the box, it is allowed to support a fan up to 35 lbs. If the box is marked with a weight, it can support a fan up to that weight, but not more than 70 lbs. Ceiling paddle fans over 70 lb must be supported independently of the outlet box [314.27(C)].

Occasionally an electrician may install an extra, unused switched conductor in a luminaire outlet box installed in the ceiling. While this may seem like a nice feature because it allows for a future ceiling fan, it's a Code violation when the ceiling fan is finally installed unless the box is listed to support a ceiling

fan. This change was accepted after initial reluctance, because the *NEC* isn't in the habit of dealing with future violations, no matter how likely they might be.

The result of this change in 314.27(C) is that such an installation must incorporate a box that's suitable for ceiling fan support, despite the fact that a ceiling fan isn't installed. Considering the effort required to install the separate, independently switched conductor, this change doesn't add much of a burden to the electrical community. It does add an enforceable requirement for AHJs who didn't have one before.

Where spare, separately switched, ungrounded conductors are provided to a ceiling-mounted outlet box in a location acceptable for a ceiling-suspended (paddle) fan in a dwelling unit, the outlet box must be listed for the support of a ceiling-suspended (paddle) fan [314.27(C)].

Pull and Junction Boxes and Conduit Bodies

The title of 314.28(A) is "Pull and Junction Boxes and Conduit Bodies." That title signifies that this section applies not only to pull and junction boxes, but also to conduit bodies. Unfortunately, the text didn't seem to support this title in the 2008 *NEC*.

Nowhere in 314.28(A)(1) or (A)(2) did the reader see "conduit bodies." This change makes it clear that the rule does apply to conduit bodies, not just to pull and junction boxes.

See the Sidebar for the minimum size rules in 314.28. Here are some other key requirements:

- Boxes and conduit bodies containing conductors 4 AWG and larger that are required to be insulated must be sized so the conductor insulation won't be damaged.
- The requirements for sizing boxes and conduit bodies containing conductors 6 AWG and smaller are contained in 314.16.
- If conductors 4 AWG and larger enter a box or other enclosure, a fitting that provides a smooth, rounded, insulating surface, such as a bushing or adapter, is required to protect the conductors from abrasion during and after installation [300.4(G)].

Power distribution blocks

Power distribution blocks have a history of being used in large pull and junction boxes, even though the *NEC* has been silent on these installations. The

only requirements for power distribution blocks were in Article 376 (which applies only to metal wireways). This left uncertainty regarding the field installation requirements for these blocks in junction boxes. The NEC now addresses this practice and provides clear, concise rules.

Some key facts:

- Only boxes exceeding 100 cu in. can contain power distribution blocks.
- The power distribution blocks must be listed.
- The values in Table 312.6 apply to the wire bending space at the terminals.
- Live parts of the power distribution block must be covered, whether the box cover is installed or not.
- Where the junction box has conductors that don't terminate on the power distribution block(s), the through conductors must be arranged so the power distribution block terminals are unobstructed following installation.

Hand-hole enclosures

The 2008 *Code* rule in 314.30(D) required that covers of hand-hole enclosures containing service conductors be bonded per 250.92(A). While the bonding requirements for metallic equipment containing service conductors are indeed found in 250.92, they're found in Subsection (B), not (A). This error has been corrected by referring to 250.92.

Saving time

The 2011 *Code* revisions eliminated many sources of confusion on the requirements for the boxes and similar raceway components. However, designing a code-compliant layout still has its challenges.

Because code violations can mean expensive rework, a good design review is obviously critical. This is no less true as you evaluate the requirements found in Article 314 and review the design in a cost-efficient manner. A methodical approach of reviewing each section of Article 314 against your design blends efficiency with compliance, and in the end, will save you money.

Sidebar. 314.28 Minimum size rules

For raceways containing conductors 4 AWG and larger, the minimum dimensions of boxes and conduit bodies must comply with the following:

- **Straight Pulls.** The minimum distance from where the conductors enter the box or conduit body to the opposite wall must not be less than eight times the trade size of the largest raceway [314.28(A)(1)].
- **Angle Pulls.** The distance from the raceway entry of the box or conduit body to the opposite wall must not be less than six times the trade size of the largest raceway, plus the sum of the trade sizes of the remaining raceways on the same wall and row [314.28(A)(2)].
- **U Pulls.** When a conductor enters and leaves from the same wall of the box, the distance from where the raceways enter to the opposite wall must not be less than six times the trade size of the largest raceway, plus the sum of the trade sizes of the remaining raceways on the same wall and row.
- **Splices.** When conductors are spliced, the distance from where the raceways enter to the opposite wall must not be less than six times the trade size of the largest raceway, plus the sum of the trade sizes of the remaining raceways on the same wall and row.
- **Rows.** If there are multiple rows of raceway entries, each row is calculated individually and the row with the largest distance must be used.
- **Distance Between Raceways.** The distance between raceways enclosing the same conductor must not be less than six times the trade size of the largest raceway, measured from the raceways' nearest edge-to-nearest edge.

When conductors enter an enclosure with a removable cover, the distance from where the conductors enter to the removable cover must not be less than the bending distance as listed in Table 312.6(A) for one conductor per terminal [314.28(A)(2) Ex].

Boxes or conduit bodies smaller than those required in 314.28(A)(1) and 314.28(A)(2) are permitted, if the enclosure is permanently marked with the maximum number and maximum size of conductors [314.28(A)(3)].

Hall
AUTOMOTIVE
More Cars. Great People

MARK SMELLEY
Commercial Sales Consultant

Hall Chevrolet
Western Branch
 3412 Western Branch Blvd.
 Chesapeake, VA 23321-5108 mark.smelley@hallauto.com
 www.hallauto.com

Cell 757-773-6855
 Main 757-233-8120
 Fax 757-233-8175

Breaker Box
Plus

*Specializing in
 custom homes,
 service upgrades,
 and small
 commercial work*

Mas. Electrician: Sam Dowdy
 757-652-7007
 Journeyman: Sean Dowdy
 757-695-8000

Coastal Lighting
& Supply

Jeanell A. Willis
 Certified Lighting Specialist
 Phone: 757-436-7595
 Fax: 757-436-7398
 1-800-472-5046

1020 Executive Boulevard
 Chesapeake, Virginia 23320
 www.coastallighting.com
 jwillis@coastallighting.com

Supplier of all your electrical needs.

N **C** City
A **E** Electric
T **S** Supply
I
O
N
E
W
I
D
E

Wayne Joyner
 Sales Representative

ph: 757.390.4381
 fx: 757.390.4385
 cell: 757.328.2537

W.joyner@ces-us.net • www.e-ces.net
 5875 Adderley Street Norfolk, VA 23502

Professional Power Systems

GLENN WALLS, PE
 Electrical Engineer

2417 Entrada Drive
 Virginia Beach, VA 23456
 (757) 721-0319 / Fax (757) 721-0327
 glennwalls.pps@cox.net

GraybaR

Brian H. Saucier
 Branch Manager

Member
 Gamma Beta Epsilon
 honorary society

3808 Progress Road
 Norfolk, VA 23502
 Direct: 757-852-2504
 757-857-1241
 Fax: 757-855-2837
 brian.saucier@graybar.com

ECAT



YOU ARE CORDIALLY INVITED!

Since 1954, ECAT has worked to unify residential and light commercial contractors, licensed tradesmen and associated support businesses in the Hampton Roads area. This is accomplished through fellowship, trade & area related topics of interest, continuing education, activities and the strength of organizing independent business owners and tradesmen who may share common goals and interests.

Membership in ECAT includes:

- 7 dinner meetings per year (September – April) with Happy Hour, guest speakers and vendor display's
- Association with other Tradesmen, Inspectors, suppliers and trade supporting businesses
- Newsletter on our industry
- Public advertising for your business with Yellow Page exposure
- Job Referrals

ECAT is also involved in raising money for many charitable organizations including the American Cancer Society, Children's Hospital of the King's Daughters and Habitat for Humanity.

Join us at the next ECAT meeting, any 3rd Thursday of the month. The meetings are held at Soul Haven Hall, 1080 Aragona Blvd, Virginia Beach, VA, 23455, and begin with a happy hour at 6:30 p.m. followed by dinner with a guest speaker from 7:00 – 9:00 p.m. First time sponsored guests are free. Non-sponsored guest fee is \$45. This is a wonderful way to gain exposure for your business, expand your contacts and meet new people. I can personally guarantee that it will be among the most rewarding membership dollars you will spend.

Please call me at 855-0011 if you are able to join me. For more information on ECAT visit our web site at www.ecatva.com.

Business

UNDEFINED EXPECTATIONS

I don't like Cost Plus contracts. In my opinion, they are a lawsuit waiting to happen. I feel so strongly that we've posted 30 reasons contractors should do Cost Plus (or Time and Materials) contracts. You can read them [by clicking here](#).

On many of our webpages we have a place at the end where you can give us your opinion, and last week a reader posted the following comment:

"Your 'partial' list of the pitfalls of Cost Plus type construction contracts is humorous, gut wrenching, and all too true."

"However, your setup for the list, the 'two major reasons' that Contractors use them is really missing THE major reason. That reason is the lack of complete, comprehensive, plans and specifications at the start of construction."

"The majority of 'Architecturally Designed' plans for a remodel in our area provide just enough information for the Building Dept. to approve a permit. This results in a design that is more concept than detail with the onus on the Owner and Contractor to work out all the details during the construction process, which is VERY inefficient."

"Drywall finish? Oak or maple floors? Light fixture schedule? Cabinet style? Countertop material? Backsplash? Casing style? Paint colors? Tile design? Plumbing fixtures? Well, we'll just decide on those when the time comes."

"The Owners believe that they have already paid for design because they have a building permit, so, what is the cost of this job?"

I agree that incomplete plans and specifications are a problem in construction. We have all been down that path, starting a job with incomplete plans and by the end of the job we were saying, "Why do I do this to myself?" And the easy way to solve this problem is to resort to some version of a Cost

Plus contract. The belief is that a Cost Plus contract will protect you no matter what changes will be made before or after the job starts.

The real question is, why are you making someone else's problem your problem?

Well, as [Chuck Miller](#) likes to say, "There is a better way." When you are presented with a set of incomplete plans, it's time to have a serious discussion with the owner. If the architect or designer want to join the discussion, that's even better. Let them know that the plans are basic and lacking the details you need if you are to give them anything more than your best guess at the sales price for your work. That best guess, by the way, will be subject to change every time the plans change.

You need to tell them there is much more detail work that needs to be done before the plans are ready to be quoted. That work will require additional time and effort on your part, but is necessary to get the plans to the point where you know exactly what it is the potential client wants built. Then, and only then, can you give them a firm, fixed price quotation on the plans for that job.

Now, this is normally the point where it all falls apart, because many contractors won't take the next step and tell the owner that they will be glad to do that work if and only if they are paid for their work or they get a written commitment up front for the job. They are afraid they will upset the owner so they say nothing. The owner then assumes that the contractor is going to provide all that work for free. The contractor is now in a no-win situation, giving away a lot of their time and expertise without any guarantee they will get the job. Or, the contractor will agree to a Cost Plus contract and the client will be happy until they run out of money because they didn't realize all those changes cost far more than they expected.

When both the plans and the cost of the project are undefined, there's a strong possibility that the contractor and their

potential client see two different outcomes. And when two parties have different expectations at the beginning of a project, there's trouble ahead. Work from completed plans; write fixed price contracts.

And don't fix incomplete or poorly drawn plans unless you get paid for it. Where is it written that you should work for free? You only have so much time each day and that time must be spent earning the money you need to provide for your family, your company and your employees.

The following list are some (but not all) of the major reasons that a contractor in a construction related business should not do Cost Plus or Time & Material contracts or billing to their customers.

There are two major reasons construction-related business owners use Cost Plus or Time & Material Contracts:

1. Difficulty estimating jobs. Many contractors don't know or understand how to estimate, and others do not have a good estimating system in place that will allow them to accurately estimate construction projects. They default to Cost Plus because they believe these contracts will allow them to bill for all their job costs, all their overhead and make a profit. Unfortunately, this seldom happens. (For more on how to estimate a construction job, review our [Profitable Estimating Training Class](#).)
2. Not knowing how to establish a sales price. The book, "[Markup & Profit, A Contractor's Guide](#)" was written to help contractors know how to price their jobs to cover their overhead expenses and make a reasonable profit.

This list applies to all general contractors and most specialty contractors in the construction industry.

An exception would be using Time and Material billing for service work such as electrical, plumbing or HVAC service calls. Those agreements should be kept to a maximum of \$2,500.

1. There is no universal definition of Cost Plus or Time & Material Contracts or billing, thus creating confusion and misunderstandings almost immediately in any contract. Attorneys practicing law in the same town will often have different definitions of what is a Cost Plus or Time and Material Contract.
2. Lenders often will not lend on Cost Plus or Time & Material jobs unless there is a not to exceed clause. When the job goes beyond the not to exceed clause, you must have written authorization to do that work (signed, dated and completely priced out change work order) or your customer is not obligated to pay you for the work.
3. Some states now have laws that specifically prohibit the use of Cost Plus contracts.
4. Based on discussions with attorneys, and our work as an arbitrator, Cost Plus or Time & Material jobs generate lawsuits at a rate of 2 or 3 to 1 and arbitrations at 9 to 1 over fixed figure contracts.
5. Cost Plus or Time & Material contracts are an easy way out of doing detailed project study and estimating. This increases the chances that the original "estimate" for work to be done will be low to very low. You risk accusation of violation of the GOOD FAITH & FAIR DEALING law for "Low Bidding" estimates. An estimate below the actual price will lead to a fight over money when the real costs start coming in and the customer is requested to pay more for the job than the original estimate.

6. Because of the perception that on Cost Plus or Time & Material contracts the Owner is required to pay for absolutely everything, many contractors do not write out change work orders and have the Owner sign them, falsely believing that they (the contractor) will be paid for all the work that they may do on that job.
7. Owners often go into a Cost Plus contract thinking they have ample money to cover the job. When the job reaches the 60% to 80% completion point, and the owners have made multiple changes to the job increasing the cost, they run out of money. Their claim will be that the contractor overcharged from the start of the job, and the contractor will be expected to finish the job for the money that's already been paid.
8. For your own protection, you must keep an accurate day to day log of all labor, materials, sub-contract and other fees or costs on the job to be able to verify your actual expenses to date. If you do not, depending on your contract, you may not be able to collect for undocumented expenses, regardless of what kind of or how much work has been done.
9. In addition, you must have in your possession every document from the job that has incurred a cost. This includes all time cards, invoices, or any other papers related to the project. If you lose any item, you may not be paid for it.
10. With the need to keep very careful records on the jobs, you substantially increase the amount of meeting and preparatory time necessary for the job. Often this time will be 3 to 4 times the amount of time necessary to complete a fixed figure contract. Cost Plus or Time & Material jobs require at least two and often three times as many meetings with the customer to

review job progress, billings, invoices, labor, etc. Who pays for the meeting time and the extra administration time to prep all documents for labor and invoices from subs and suppliers?

11. Who draws the plans and gets the permits on a Cost Plus or Time & Material job? If a mistake is made on the plans, who pays for the time it takes to redraw the plans, and who pays to tear out the mistake and rebuild it?
12. Who pays for the Engineering if the Owner forgets to include it on the plans that they provide, and who pays for your down time while you wait for these revisions?
13. Suppose Engineering on a portion of the job gets by the plans examiner, the inspector catches the problem, and the job has to shut down until the engineering is complete and new plans drawn and ready to use. Who pays for the new plans & delays? Who pays for tearing out the wrong structural work completed and the materials that are ruined due to tear out? Who pays for the additional labor needed to correct the problem? Who pays for the down time for you and your crew, driving time, re-start up time?
14. Will the Owner be willing to pay for your travel time to and from your office for meetings or discussions on problems that might arise on the job, or from the job site to your suppliers and back to the job site for material pickup that either they or you forgot?
15. If you make a mistake on a Cost Plus or Time & Material job, who pays for it? Do you donate your time or is the customer willing to pay for it? Who pays for ruined materials? Who pays to go get the new materials and the cost of the vehicle expense to do the pickup?

16. Who makes up the material lists for jobs with Cost Plus or Time & Material contracts that are needed before the job starts? If you do, will you be paid for that time?
17. Owners are far more prone to want to furnish some or all of the materials for their jobs when using a Cost Plus or Time & Material contract. The Contractor is expected to guarantee those materials when installed, not to mention losing the markup on those materials. Who pays for the time to replace defective materials supplied by the owner?
18. What happens when the Owner is to supply some of the materials and they forget to buy a certain item or don't know what materials to bring to the job site? Who pays to get the forgotten items? What happens if it takes the owner two or three days (or longer) to get the needed materials to the job site? What do you and your crews do in the meantime and who pays for that down time?
19. Owner goes to your supplier (with your permission) charges materials for the job to your account. What happens if you send the owner to a certain supplier you normally use for materials, they purchase the materials, and then later claim that they could have purchased the same materials at another location at a better price? You gave them the higher priced supplier to go to, so you are responsible for the difference in cost.
20. Cost Plus or Time & Material reviews show the Owner what you are paying for materials. This will increase the probability of complaints from the customer that they could have bought the same item elsewhere for less money. It also leads to customer believing they only have to pay the amount that they could have bought

the materials for.

21. Owner expects you to be fully productive on their jobs for 8 hours a day. They will be looking over your shoulder constantly. You will seldom if ever get the job done as quickly as they are expecting you to do it. Will they be willing to pay for your State's mandated morning and afternoon breaks for your employees? Will they be willing to pay for smoke breaks, coffee breaks, mobile phone time? Will they pay for the time for you or one of your employees to escort an inspector through the job and answer questions? Who pays for the labor and materials to do required changes?
22. Contractor must be far more diligent in policing employees so that they are productive on the job at all times, with no miscellaneous discussions or activities on or about anything other than the job they are working on. Again, this pertains to starting and quitting times, smoke breaks, coffee breaks, mobile phone time.
23. It is very difficult to "compete" on Cost Plus commercial jobs because larger construction companies will take these jobs at cost, to build presence with corporations that allocate the multi-million dollar projects on assignment basis because of favorable past performance.
24. From the customer's standpoint, Cost Plus contracts give the contractor little incentive to get in and get the job done. Instead, the contractor's incentive is to keep the clock running, especially if they don't have the next job lined up. Cost Plus jobs often run far longer than would be considered normal with a fixed fee contract.
25. Owners believe that Cost Plus or Time & Material jobs will cost them less money to build their job. Therefore they expect you to charge them less

money for the work that you do. (i.e., less than your normal overhead and profit). In most cases, Owners believe that you should only make:

Remodeling = 10% Overhead and 5% to 10% Profit

New Home Construction = 10% Overhead and Profit

Specialty Construction = 6% to 10% Overhead and 5% to 10% Profit

This makes it extremely difficult for you to use your established markup on that job, especially when you have to show them your invoices at the normally required meetings to review the job progress and expenses to that date.

26. Owners do their homework, put their job out for "Bids" @ Cost Plus or Time & Material plus 6%, 7% or 8% maximum markup. They tell you if you don't want to bid that way, don't enter a bid. They also tell you that "You're not going to make your normal markup on my job!", i.e. take it or leave it.
27. One way many contractors handle Cost Plus or Time and Material contracts is to take items that are considered overhead and stuff those costs into the job cost section. In court, a sharp expert witness will find the overhead items listed under job costs and accuse the contractor of "double dipping" on the job. This immediately paints the contractor as dishonest, making a win in court even more difficult if not impossible.
28. Most Cost Plus contracts give the Owner the right to either select the

subs for their job from a list supplied by the General Contractor, or the Owner can hire their own subcontractors that the Owner will supervise during the job. What happens if subs hired by the Owner don't adhere to the General Contractor's time schedule? Who is responsible for delays and downtime caused by their lack of cooperation? What prevents the Owner from suing the contractor for lack of supervision and other damages caused because the job did not get done on time?

29. When you have subs working on the same project, some hired and supervised by the General Contractor and some hired and supervised by the owner, what do you do if there is a scheduling or other conflict on the project? Who resolves it, how long will it take to resolve? If the General Contractor is responsible for supervising subs hired and paid by the owner, will the General Contractor be reimbursed for that responsibility (and liability)?
30. If (for example) a drywall contractor hired by the owner runs a screw into copper pipe installed by the plumber, who takes responsibility? If it isn't discovered until water damage appears when the project is complete, who gets called for the warranty?

We are sure with a little research, there are more reasons Cost Plus or Time & Material Contracts can cause your business problems. But the reasons listed above should be enough of a warning to avoid Cost Plus or Time & Material contracts or billing.

TECHNOLOGY

The most influential people of the electrical industry.

William Gilbert was an English physician and scientist, the first man to research the properties of the lodestone (magnetic iron ore), publishing his findings in the influential 'De Magnete' ('The Magnet'). He also invented the term 'electricity'.

William Gilbert (also Gilberd) was born on 24 May 1544 into a prosperous family in Colchester, Essex. He was educated at Cambridge University, where he received a BA, MA and MD, after which he became a senior fellow. He practised as a doctor in London for many years and in 1600 became president of the Royal College of Physicians. He served as physician to Elizabeth I in the last few years of her reign.

'De Magnete' was published in 1600 and was quickly accepted as the standard work on electrical and magnetic phenomena throughout Europe. In it, Gilbert distinguished between magnetism and static (known as the amber effect). He also compared the magnet's polarity to the polarity of the Earth, and developed an entire magnetic philosophy on this analogy.

Gilbert's findings suggested that magnetism was the soul of the Earth, and that a perfectly spherical lodestone, when aligned with the Earth's poles, would spin on its axis, just as the Earth spins on its axis over a period of 24 hours. Gilbert was in fact debunking the traditional cosmologists' belief that the Earth was fixed at the centre of the universe, and he provided food for thought for Galileo, who eventually came up with the proposition that the Earth revolves around the Sun.

Gilbert died on 30 November 1602, probably of the plague.

Training

Grounding and Bonding of Separately Derived Systems

By Mike Holt for EC&M Magazine

Separate sources require separate return paths

Separately Derived Systems (SDS) include most transformers. They also include any generator or UPS supplying a transfer switch that opens the neutral conductor.

What makes a system "separately derived?" It's sourced from something other than a service—where there is no direct electrical connection between the two systems [Article 100].

This lack of a direct connection raises some interesting questions for safety and power quality.

That SDS will necessarily be at a different potential (voltage) from other systems. So, for example, what happens when you transfer the load from the service, where the metal parts of the electrical equipment are connected to the service neutral, but not the generator neutral? The NEC answers such questions in 250.30, by providing the requirements for SDS.

System bonding jumper

The *system* bonding jumper is a conductor, screw, or strap that bonds the metal parts of a SDS to the system neutral point [250.2]. The system bonding jumper provides a low-impedance fault current path to the power supply to facilitate the clearing of a

ground fault by opening the circuit overcurrent device.

During a ground fault, metal parts of electrical equipment, metal piping, and structural steel will become energized. This situation provides the potential for electric shock and fire. The system bonding jumper resolves this situation by creating a path from the metal parts back to the source, and allows overcurrent devices to operate, clearing the ground fault and removing the dangerous condition.

Dangerous objectionable neutral current will flow on conductive metal parts of electrical equipment, metal piping, and structural steel if you install more than one system bonding jumper. Because of this, you can't have a neutral-to-case connection on the load side of the system bonding jumper, except as permitted in 250.142(B).

You also get objectionable current if the system bonding jumper is located somewhere other than where the grounding electrode conductor (GEC) terminates to the neutral conductor. You can terminate the GEC to the neutral conductor either at the SDS system or at the system disconnecting means. But pick one—you can't have it in both locations [250.30(A)(3)].

If you install the bonding jumper at the disconnecting means:

Route the neutral conductor with the secondary conductors.

Size the neutral conductor no smaller than specified in Table 250.66, based on the area of the secondary conductors.

If you install the secondary conductors in parallel, size the neutral secondary conductor in each raceway (or cable) no smaller than specified in Table 250.66, based on the area of the largest ungrounded conductor in the raceway (or cable).

Remember that in no case can you size the neutral conductor smaller than 1/0 AWG [310.4].

An equipment bonding jumper must connect the metal parts of the SDS to the neutral conductor at the disconnecting means per 250.30(A)(2).

Equipment bonding jumpers

You must run an equipment bonding jumper to the secondary system disconnecting means, regardless of where the system bonding jumper is installed. Where the equipment bonding jumper is of the wire type, size it per Table 250.66, based on the area of the secondary conductor in the raceway or cable.

Question: What size equipment bonding jumper is required for a flexible metal conduit containing 300 kcmil secondary conductors?

(a) 3 AWG (b) 2 AWG (c) 1 AWG (d) 1/0 AWG

Answer: (b) 2 AWG, Table 250.66

Grounding electrode conductor (GEC)

You must install a GEC to connect the neutral terminal of an SDS to a grounding electrode of a type identified in 250.30(A)(7) [250.30(A)(3)]. But you don't have to do this if your SDS is for a Class 1, Class 2 or Class 3 circuit, and is rated 1 kVA or less [250.30(A)(3) Ex No. 1]. Size the GEC per 250.66, based on the area of the secondary conductor.

To prevent objectionable neutral current [250.6] from flowing onto metal parts, the GEC must originate at the same point on the SDS where the system bonding jumper is connected [250.30(A)(1)].

What if you have multiple SDS? In such a case, you can connect the neutral terminal of each derived system to a common GEC. The GEC must not be smaller than 3/0 AWG copper. Size GEC taps per Table 250.66, based on the area of the secondary conductor.

For multiple SDS, you also have to make GEC tap connections at an accessible location by:

Listed connectors.

Listed connections to aluminum or copper busbars not less than 1/4 x 2 in. If using

aluminum busbars, they must comply with 250.64(A).

Exothermic welding.

Connect grounding electrode taps to the common GEC so the common GEC isn't spliced.

The GEC must be:

Of copper where within 18 in. of earth [250.64(A)].

Securely fastened to the surface on which it's carried [250.64(B)].

Adequately protected if exposed to physical damage [250.64(B)].

And metal enclosures enclosing a GEC must be made electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode [250.64(E)].

System grounding reduces overvoltage caused by induction from indirect lightning, or restriking/intermittent ground faults. Induced voltage imposed from lightning can be reduced by short grounding conductors and eliminating unnecessary bends and loops [250.4(A)(1) FPN].

System grounding also helps reduce voltage stress on electrical insulation, thereby ensuring longer insulation life for motors, transformers and other system components.

Grounding Electrode

Install the grounding electrode as close as possible to where the system bonding jumper is located. Preferably, it will be in the same area as that jumper.

What can you use for a grounding electrode? Per 250.52(A), you can use a metal water pipe electrode or structural metal electrode [250.30(A)(7)].

But what if you don't have one of those electrodes present? The NEC makes allowances for just such a situation. You have to use one of the following:

Concrete-encased electrode. It has to be encased by at least 2 in. of concrete. The question is, do you stand that electrode up vertically or lay it down horizontally? Either

way is acceptable, if the electrode is within that portion of concrete foundation or footing that is in direct contact with the earth. But if it's horizontal it needs to be near the bottom of the encasement. The electrode itself has to be at least 20 ft of electrically conductive steel reinforcing bars or rods of not less than 1/2 in. diameter, or it can be 20 ft of 4 AWG conductor [250.52(A)(3)].

Ground ring. This must encircle the structure and be buried at least 30 in. below grade.

The ring must consist of at least 20 ft of bare copper conductor not smaller than 2 AWG [250.52(A)(4) and 250.53(F)].

A ground rod. It needs at least 8 ft of contact with the soil. It must meet the requirements of 250.56 [250.52(A)(5) and 250.53(G)]. To get the 25 ohms resistance, you may need to drive an additional rod. You don't have to keep driving rods until you get 25 ohms, however. The rule is you must drive a second one if the first one is higher than 25 ohms. The NEC requires you to place the second rod at least 6 feet from the first one, but it's even better if the rods are farther apart.

Other listed electrodes [250.52(A)(6)].

Steel and pipes

To ensure the quick removal of dangerous voltage from a ground fault in the area served by the SDS, connect the structural steel and metal piping of that area to the neutral conductor at the SDS per 250.104(D).

What happens if you don't make this connection? You end up with a difference of potential (voltage) between your SDS and the structural steel and

metal piping. During a fault condition, this could cause property damage from a fire and even prove fatal from electric shock.

The fact that electricity seeks to get back to its source is a fundamental concept of electrical theory. And, it's a concept that will help you with your SDS applications.

Differences of potential (voltage) create hazards for people and equipment. So, you don't want these to exist in your SDS. Nor do you want differences of potential (voltage) between systems.

You have to eliminate these dangerous differences of potential (voltage) while keeping systems separate. How you achieve that is a matter of how you install and connect your system bonding jumper, equipment bonding jumpers, GEC, and other bonding and grounding components. If you address each of these components per the requirements of 250.30, the electricity in your SDS will properly return to its source. More importantly, you will have averted the hazards arising from differences of potential (voltage).



Resource Lighting
Jesse James Jernigan
Specification Sales

4542 Bonney Rd., Suite A
Virginia Beach, VA 23462
Phone 757-460-5682
Fax 757-456-5631
Cell 757-620-4193

361-9372

jjernigan.la343@lighting.net



WHERE WE ARE SERVICE PROUD

Gregory C. Young
Branch Manager

Virginia Beach	Newport News
PO Box 5593	PO Box 5208
Virginia Beach, VA 23471	Newport News, VA 23605
5894 Thurston Ave (23455)	1030 48 th Street (23607)
757-460-1161 / Fax 460-3464	757-244-0125 / Fax 247-5414
Pager 757-456-4733	Voice Mail - 757-460-5218 Ext. 2025
E-mail: gcyoung@ecksupply.com	



Maddux
SUPPLY COMPANY
Electrical and Mechanical Supplies

OFFICE: (757) 547-7532
FAX: (757) 547-2924
CELL: (757) 285-1717

AUBREY W. BRADY
SALES REPRESENTATIVE

P.O. BOX 2107 CHESAPEAKE, VA 23327	1438 TINTERN STREET CHESAPEAKE, VA 23320
Email: abrad@madduxsupply.com	



HILLEGASS
ELECTRICAL SUPPLIES & LIGHTING

JIM SPARKMAN Vice President	1728 S. Military Highway Chesapeake, Virginia 23320 Tel. (757) 420-6221 Fax (757) 420-6692
--------------------------------	---

Finance

PRIORITIES

By Michael Stone

I was in Providence, Rhode Island doing some classes at the JLC Live show. It was a great show, I saw a lot of old friends, made some new ones and was pleasantly surprised by the number of contractors that showed up to visit the show floor. I was a bit disappointed that not nearly as many registered for or attended the classes.

One of the contractors on the exhibit floor was asked why he wasn't attending any classes. His response was, "Money is tight, can't afford it."

Money is tight, can't afford it. But he could afford to pay to look at new tools and products being offered by manufacturers, maybe sit in on the "how to do it" classes. Those classes are the ones on installing windows, doors, siding, decking and hand railings, etc. Mechanic stuff. Those classes last from 30 minutes to an hour and many of them have 75 to 100 people attending. Standing room only is often the case. Many, not all, but many of these guys are looking for some pearl of wisdom that will somehow double their production speed. "Oh, if I could only install those windows faster, think of all the money I could make."

Now, go upstairs to the area where the business management classes are being taught. Exact same time and day, you can walk into a class on building websites, or perhaps on how to use social media to increase the number of leads you are getting. In those classes you'll find maybe 20 to 30 people. Our coaching clients with an up-to-date website with good search engine optimization (SEO) get 40% to 60% of their new business from that website. Yet where did most contractors focus their time and attention? You got it; on the show floor where the tools and products were.

Folks, if you don't get leads and can't sell the job, you won't get a chance to use those tools.

As I mentioned to the attendees in one of the classes, this is not a practice round, this is the real thing. If you don't get it right, you are gone, out of here, history. Over 90% of all construction business failures are due to poor business management or not charging enough for the work being done. Less than 2% of business failures happen because of problems on the job site. So why don't business owners focus on the stuff that causes the huge majority of them to fail?

Think about it this way. If your business doesn't make it, how will it impact your family? Your employees, subs, suppliers? Their families? What will it do to your customers that may have something go wrong with the job you did for them? And, if your business fails, how does that make the rest of us look?

So how do you make yourself a better businessperson? Start here. Sit down with a pad and pencil. Finish reading this newsletter, take a minute to read past newsletters if you haven't already. (You can find our newsletters from the past year [by clicking here](#).) Write down everything and anything that is new or you are not sure about. In other words, list those things about business that you don't know. Spend a few days, get on the net and find other newsletters or articles about construction business management. Read every related Blog you can find. Write down everything that you do not know or understand. Consider these starter topics:

Percent of completion accounting. Based on the calls we get into our office, at least half of our readers need to know more about that term. Should you be using it or accrual accounting? Cash basis accounting?

What is SEO, can you determine how your website is performing?

Balance sheets, Profit and Loss statements. Can you read and understand yours?

What is the difference between markup and gross margin? Do you know the formulas to convert one to the other? Is dumping all your overhead onto your hourly rate a good idea or not?

Marketing. Where and how should you be marketing your business?

Sales. What should you do when the homeowner wants an itemized bid? Wants to provide their own materials? Wants you to email their bid because they are busy?

Employees. What's the right number of employees for your size business?

Make your list and prioritize it based on how much you know about the items. Put the item you know least at the top. Now get busy and read one hour each day, starting with the subject at the top of your list. If you find out about a class in your area that covers that topic, attend the class. Become the guru of that topic, then move on to the next topic.

Do this and in a year, you and your business will be doing just fine. You will be able to go to the JLC Live show and attend any class you want, the money will be there.

Building Your Website

We are continually asked about where to get information on building a web site or, "who do you know that can help me build a website?" We can get you started if you'll visit our website at:

<http://www.markupandprofit.com/how-to-get-a-website.html>. Devon has covered the basics that you'll need to know to get a website up and running.

Websites were a major topic of discussion at the recent JLC Live show. Everyone wants to know how to build one or improve the one they already have. Devon's paper is a great place if you are just starting. If your website is already complete, use it to review and compare what you have done to what is needed to attract customers in today's market place.

Getting your website up and humming should be near the top of your priority list. Potential clients who have the money to spend on their home often start on the Internet, and you need to be there. I mentioned to the class at JLC Live that contractors who do not get their website up and functioning well will be left picking up the jobs no one else wants within two years. Picking up jobs other companies do not want, the scraps, hardly equates to making good money.

SAFETY

Grieving father fights invisible killer: Electrical shock to swimmers

(CBS/AP) BEAN STATION, Tenn. - Three children were electrocuted in separate incidents in Tennessee and Missouri on July 4th, 2012

A sheriff in East Tennessee now says one boy swimming in a marina at Cherokee Lake was electrocuted and a second one was revived on a life flight out of the area.

Originally police reported that both boys had been killed.

According to CBS News affiliate WVLT Knoxville, Jeffrey Atkins, Grainger County EMA director, said that four children were swimming between house boats. A woman witnessed two of the children appearing unconscious. As she tried to help, the woman felt a surge and retreated.

Grainger County Sheriff Scott Layel tells the station that the boy who died was 10 years old and the revived boy is 11.

The sheriff's office says it happened around 2:15 p.m. near the German Creek Marina in Bean Station. Police say an additional six to eight people were taken to the hospital in Morristown to be checked out.

The marina has been evacuated as authorities conduct their investigation.

Meanwhile, two Missouri children have died after coming into contact with electricity while swimming at the Lake of the Ozarks on the Fourth of July.

The Missouri State Highway Patrol identified them as 13-year-old Alexandra Anderson and her 8-year-old brother Brayden, of Ashland.

The Patrol says the children were swimming near the 6.5 mile marker in the Gravois Arm of the lake when they were electrocuted by an "unknown source of electricity" just after noon Wednesday.

KOLR-TV reports several adults at the scene removed the children from the water and performed CPR until medical crews arrived.

The children were taken to an area hospital, where doctors pronounced them dead.

By Isolde Raftery. msnbc.com

When Kevin Ritz read about the children who died after being shocked by electricity while swimming in lakes in Missouri and Tennessee on Wednesday, he thought about his 8-year-old son, Lucas, and the dozens of others who have died this way.

"Everyone goes, 'How can that happen?'" Ritz said.

In 1999, Ritz's children were swimming in the Multnomah Channel of the Willamette River in Oregon when suddenly, Lucas let out a gasp and apparently became unconscious. His life jacket flipped him over so that his face was out of the water. As his wife jumped in the water to save their son, she felt paralyzed, a feeling she attributed to fear. His other son later reported that he, too, felt numb and tingly.

Law enforcement officers told Ritz that his son had drowned, but Ritz pushed them to investigate further. His son's face, he said, hadn't been submerged and he had been wearing a life jacket.

"With my digital voltmeter, I went to the area where Lucas had been, put the negative lead to a ground, dropped the positive lead into the water, and immediately got AC voltage," he wrote in an essay about his son's death. "I notified the Sheriff's Department, reporting what I had found and that I wanted to get someone to confirm my test. They agreed to send out some deputies while I called in an electrician. He arrived later that morning, tracing the electricity to a powerboat that was in the area where the kids had been swimming."

In the throes of grief, Ritz, now a marine electrician, started agitating for safer marinas. It infuriated him, for example, that electrical outlets at marinas were not held to the same standards as outlets in bathrooms.

"The European market has had ground fault protection in their marinas - the power coming into the marina at the docks - for over 25 years," Ritz told msnbc.com. "How come we can't have that?"



HEALTH

THE NOSE KNOWS

In a recent issue of Daily Health News, I talked about how I conquered my chronic sinusitis when I stopped eating wheat, sugar and dairy products.

But not everyone is that lucky, and many people continue to suffer from troubling symptoms, such as headaches, runny noses, irritability and fatigue.

A study at the University of Minnesota offers new hope for sinusitis sufferers. It turns out that synthetic interferon -- a biologically engineered version of a natural immune system compound that has been used to treat diseases such as cancer, multiple sclerosis and hepatitis C -- may also have a role in treating cases of stubborn, treatment-resistant chronic sinusitis. Nine out of 10 participants in the small pilot study improved markedly on interferon gamma therapy.

How does it work? Synthetic interferon appears to compensate for the depletion of our natural interferon, which normally helps us to fight off infection and tumors. Over time, inborn defects in the cells of the immune system or environmental factors, such as exposure to pollutants, can sap our supply of interferon.

"I think it is an interesting, thought-provoking preliminary study," comments Dr. Harvey Plasse, director of otolaryngology at NYU Downtown Hospital, associate professor of otolaryngology at New York University School of Medicine and coauthor of Sinusitis Relief. "The interferon seemed to correct an immune deficiency. This speaks to the central thesis of my book, which is that chronic sinusitis is an inflammatory disease in which immune dysregulation plays an important role."

Research carried on at The Mayo Clinic for the past four years has shown that most sinus disturbances are caused by yeast infections, which in turn can depress immune system functionality. This work has been cited in The New York Times. We will talk about the "yeast connection" in an upcoming issue of Daily Health News.

Side effects of interferon gamma generally were limited to local skin reactions in the study... but this is not always the case. More commonly, interferon treatment causes flu-like symptoms, which can be severe and include headache, aching muscles, fever and chills. The smaller dosage in sinusitis may account for the reduced side effects, according to Dr. Harumi Jyonouchi, Department of Pediatrics, University of Medicine and Dentistry of New Jersey, lead author of the study.

In short, although interferon shows promise, for now it still is an experimental treatment for sinusitis and should be considered as a last resort. It is not for your average, run-of-the-mill sinus infection.

Nevertheless, chronic sinusitis can be an exasperating and tenacious condition that defies diagnosis and treatment. As Dr. Plasse says, "The interferon story is one more piece in the puzzle."

Strengthening your immune system to create overall wellness is, once again, another critical piece.

Be well,

Carole Jackson
Editor
Bottom Line's Daily Health News

REFLECTIONS

Wisdom is not an attainable intellectual property but rather a state of being that can only be maintained through practice.

ON THE LIGHTER SIDE

Just when you think the world is getting a little smarter.....

Idiot # 1

I am a medical student currently doing a rotation in toxicology at the poison control center. Today, this woman called in very upset because she caught her little daughter eating ants. I quickly reassured her that the ants are not harmful and there would be no need to bring her daughter into the hospital. She calmed down and at the end of the conversation happened to mention that she gave her daughter some ant poison to eat in order to kill the ants. I told her that she better bring her daughter into the emergency room right away. Here's your sign, lady. Wear it with pride.

Idiot # 2

Seems that a year ago, some Boeing employees on the airfield decided to steal a life raft from one of the 747s. They were successful in getting it out of the plane and home. When they took it for a float on the river, a Coast Guard helicopter coming towards them surprised them. It turned out that the chopper was homing in on the emergency locator beacon that activated when the raft was inflated. They are no longer employed at Boeing. Here's your sign, guys. Don't get it wet; the paint might run.

Idiot # 3

A true story out of San Francisco:
A man, wanting to rob a downtown Bank of America, walked into the branch and wrote "this iz a stikkup. Put all your munny in this bag."
While standing in line, waiting to give his note to the teller, he began to worry that someone had seen him write the

note and might call the police before he reached the teller's window. So he left the Bank of America and crossed the street to Wells Fargo. After waiting a few minutes in line, he handed his note to the Wells Fargo teller. She read it and, surmising from his spelling errors that he wasn't the brightest light in the harbor, told him that she could not accept his stickup note because it was written on a Bank of America deposit slip and that he would either have to fill out a Wells Fargo deposit slip or go back to Bank of America. Looking somewhat defeated, the man said, "OK" and left. He was arrested a few minutes later, as he was waiting in line back at Bank of America. Don't bother with this guy's sign. He probably couldn't read it anyway.

Idiot # 4

A motorist was unknowingly caught in an automated speed trap that measured his speed using radar and photographed his car. He later received in the mail a ticket for \$40 and a photo of his car. Instead of payment, he sent the police department a photograph of \$40. Several days later, he received a letter from the police that contained another picture, this time of handcuffs. He immediately mailed in his \$40. Another sign (though this guy might be onto something worth thinking about)!

Idiot # 5

Guy walked into a little corner store with a shotgun and demanded all of the cash from the cash drawer. After the

cashier put the cash in a bag, the robber saw a bottle of Scotch that he wanted behind the counter on the shelf. He told the cashier to put it in the bag as well, but the cashier refused and said, "Because I don't believe you are over 21."
The robber said he was, but the clerk still refused to give it to him because he didn't believe him. At this point, the robber took his driver's license out of his wallet and gave it to the clerk. The clerk looked it over and agreed that the man was in fact over 21 and he put the Scotch in the bag. The robber then ran from the store with his loot.
The cashier promptly called the police and gave the name and address of the robber that he got off the license. They arrested the robber two hours later.
Remind me to have more signs printed up. Give this guy his!

Idiot # 6

A pair of Michigan robbers entered a record shop nervously waving revolvers. The first one shouted, "Nobody move!" When his partner moved, the startled first bandit shot him.

This guy doesn't need a sign; he probably figured it out himself.

Idiot # 7

Arkansas: Seems this guy wanted some beer pretty badly. He decided that he'd just throw a cinder block through a liquor store window, grab some booze, and run. So he lifted the cinder block and heaved it over his head at the window. The cinder block bounced back and hit the would-be thief on the head, knocking him unconscious. Seems the liquor store window was made of Plexi-Glass. The whole event was caught on videotape.
Oh, that smarts. Give him his sign!

Idiot # 8

Ann Arbor: The Ann Arbor News crime column reported that a man walked into a Burger King in Ypsilanti, Michigan at 12:50 A.M., flashed a gun and demanded cash. The clerk turned him down because he said he couldn't open the cash register without a food order.
When the man ordered onion rings, the clerk said they weren't available for breakfast. The man, frustrated, walked away.

CLOSING

If you are interested in becoming an ECAT member or receiving our monthly newsletter, visit our web site at www.ecatva.com, "memberships" link or, contact me at the address below.

If you have any concerns, complaints, ideas or interests about any future meetings, or you would like to contribute any publications or articles of interest to our newsletter, please contact us at ecatva1@aol.com. List your name, company name, address, phone number; fax number and/or e-mail address. Your input would be greatly welcomed.

We look forward to seeing you all at the meetings.

D.S. Jernigan

Director,
E.C.A.T.
757-855-0011

Full Page - \$85
7 1/2" wide x 10" high

2/3 Page - \$45
7 1/2" wide x 6 3/4" high

1/3 Page - \$25
7 1/2" wide x 3 1/4" high

Business Card - \$10
3 1/2" wide x 2" high

The **DEADLINE** is the end of each month for the next month.

Advertising



Electrical & Datacom Products

MICHAEL (MIKE) PACE
Datacom Area Manager

10411 Leadbetter Road • Ashland, VA 23005
Mobile: (804) 244-6169 • E-mail: mpace@rexelusa.com
Phone: (804) 550-0018 • Fax: (804) 550-0490

Wolcott Rivers Gates
ATTORNEYS AT LAW

BRANDON H. ZEIGLER
Attorney at Law

One Columbus Center, Ste. 1100 • Virginia Beach, VA 23462-6765
Direct 757.554.0226 • Phone 757.497.6633 • Fax 757.497.7267
zeigler@wolriv.com



the standard in safety

Underwriters Laboratories

Don Shields
Staff Engineering Associate

Underwriters Laboratories Inc.
333 Pfingsten Road, Northbrook, IL 60062-2096 USA
T: 847.664.1313 / M: 847.224.2760 / F: 847.313.3086
E: Donald.Shields@us.ul.com / W: ul.com



Janak & Hitesh Patel
Tel: 757.769.7177
Fax: 757.961.6484
va737@ediblearrangements.com



Edible
ARRANGEMENTS

www.ediblearrangements.com
215 Granby Street • Norfolk, VA 23510
An independently owned and operated franchise

[Type a quote from the document or the summary of an interesting point. You can position the text box anywhere in the document. Use the Text Box Tools tab to change the formatting of the pull quote text box.]

[Type a quote from the document or the summary of an interesting point. You can position the text box anywhere in the document. Use the Text Box Tools tab to change the formatting of the pull quote text box.]