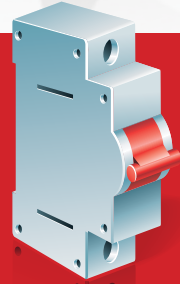




THE Breaker Buzz

Providing Electrical Solutions Worldwide VOL V

OCTOBER 2013



INSIDE THIS ISSUE

Understanding Arc-Flash, Arc-Blast Physics Can Save Your Life

By Ashley McWhorter, President, CBS ArcSafe

LIKE ANY ENERGY source, an electrical circuit is a ticking bomb. It's simply waiting for the right conditions to blow. A twisted pole, faulty interlock, and enough energy will turn an electrical firecracker into a mortal lightning strike.

And what does the smart person do when they come upon a ticking box? They turn around and go the other way, of course. And call the authorities.



Vacuum Bottle Engineering Expert Joins Vacuum Interrupters, Inc.

GROUP CBS AND VACUUM INTERRUPTERS, INC. are proud to announce that John Toney has accepted a staff engineer position with Vacuum Interrupters, Inc., a supplier of replacement vacuum interrupter parts, components, and the industry's first predictive field-testing system for vacuum interrupters.

"We're thrilled to have such a prominent vacuum interrupter engineer join our staff," said Julia Neves, vice president and operations manager at Vacuum Interrupters, Inc. (Carrollton, Texas), a Group CBS company. "Vacuum Interrupters, Inc. has positioned itself as the 'go-to' supplier for vacuum interrupter testing and replacement parts. Toney's experience will be invaluable in maintaining our leading position in the medium-voltage, vacuum interrupter-based technology markets." Toney graduated from the University of Michigan, Ann Arbor, with bachelor's degrees in both astronomy and electrical engineering. Following graduation, Toney accepted a position with General Electric's

THE VIEW FROM FLIGHT LEVEL 410

By *Finley Ledbetter*, CEO, Group CBS

Group CBS Continues Expansion on All Fronts



Group CBS affiliate companies add key personnel, continue to evaluate new locations in Northeast and around the U.S.

I CANNOT BELIEVE it has been 36 years since I walked into that room at UTA and interviewed for an intern's engineering position at Multi Amp. I guess I should be very happy no one else showed up. Everyone needs to look back and put a check mark next to that spot that helped make them what they are today. I have a few of them. That day at UTA. Meeting Joni. And all the days my kids hit the ground. And, oh yeah, let's not forget the day I called Ray and said, "Meet me for lunch. I have something to talk with you about."

Where am I going with this, you ask? I'm not sure, but it is certainly the truth that surrounding ourselves with great people and being very lucky are great advantages in life and business. I have noticed that the more hours I put in, the luckier I get. And the smarter the guys around me, the smarter I get.

In earlier issues of *BreakerBuzz*, I have written that you should surround yourself with talent, work hard, play hard, and take care of your family. But now I add this one: Let's be the guys who do what we say we will do. Let's be the guys with the products and services that work and do as promised. Let's be the guys who do not have an evil agenda. Let's be the guys who others say, "Hey, there has to be something wrong over there because they're too good." But there is not anything wrong at Group CBS. We are sailing

true and fast. And we are growing in all areas at a time when others are not.

Why is that? I guess if you understand what I wrote above, you get it.

Now around the Group, things are hopping. Western Electrical Services (WES) has hired a new salesman, Justin Sandlin, to help bolster the Intermountain Region. Let's welcome him and hope for good things out west.

In the East, we are looking to acquire and build a new service shop. Look for more on this in the next *BreakerBuzz*. For now, let me just say that our long-term plans call for us to have a full-service/heavy-service shop in the Northeast by the end of 2015.

Astro Controls has let a contract to double the warehouse in Irving, Texas, allowing us to better organize inventory and bring all our material under one roof.

CBS ArcSafe has hired Tim Kelly to help kick-start that business in the Northeast. Tim has spent the last 25 years working as outside sales for Satin in the New York area. He will work side by side with Lou to help build this market for CBS ArcSafe.

Jeff Voytek has joined Group CBS and will head up the end-service shop setup and build-out. Welcome aboard, Jeff.

Circuit Breaker Analyzer (CBA) has made great progress. We are on our third

**Let's be the guys who do what we say we will do.
Let's be the guys with the products and services
that work and do as promised.**

Bill Stephens has accepted the position as president of Circuit Breaker Sales & Repair (CBS&R), and we have started to break ground on a warehouse expansion. Bill will oversee all operations for Group CBS in the Gulf Coast region and help us take CBS&R and Reliable Electrical Testing Services (RETS) in new directions. Bill plans to relocate to Houston and has started to bring in some new staff and ideas to CBS&R and RETS.


release and have sold several accounts. CBA will be adding market and customer support structure to help in the near future. Natalie, Andrew, and Mike have been working tirelessly and have developed a great new CBA version for Windows 7. Look for that new product release before the NETA show in March 2014. It will be a real nice addition to the original iOS version. We are going to give the Windows 7 version for free to all

who have already purchased an iOS version. This will be quite a bargain.

Group CBS is working on another acquisition in the Southeast, adding another service shop to our banner. This acquisition should be done and announced before the next *BreakerBuzz*.

Vacuum Interrupters (VI) has been selling MAC (magnetron atmospheric condition) sets and service coast to coast and overseas. We have learned a lot and are improving our hardware and model. Utilities, refineries, chemical plants, and service providers have purchased the sets, and we see a steady stream of data coming from the field. Look for a release of a few new products for both MAC and Vacuum Interrupters Inc. (RVI) before the next *BreakerBuzz*.

Join me in welcoming Finley Ledbetter III to the MAC team after a two-year internship and earning a NETA level 2 card at WES. FL3 has relocated to RVI and will head up field-service demo and training for MAC products. Finley, a 2011 BSEE graduate of Texas Tech's engineering school, is working at RVI learning the ins and outs of MAC field assessment and the particulars of removal and installation of various vacuum interrupters under Jerod Day's watchful eye.

From around the Group, here are but a few of the stories behind the people. Yes, that is where we started. Dare to find the right people and put them in positions to help you do more than you could alone. Remember: To manage, you must measure, and to measure, you must have something worth measuring! 

AMC Introduces Revolutionary Panelboard

The new UL-508A-certified heat trace panelboard serves the natural gas, petroleum, pipeline, and chemical process industries.

ADVANCED MOTOR CONTROLS, a Group CBS company that specializes in electrical equipment manufacturing, remanufacturing, and life extension services, is proud to announce its new UL-508A-certified Heat Trace Panelboards (HTP). Advanced Motor Controls' ProC™ and ProCS™ Series HTP are designed for use in natural gas, petroleum, chemical processing, and related pipeline operations.

"Advanced Motor Controls is proud to become one of the few UL-certified U.S. suppliers of heat trace panelboards in support of the U.S. natural gas and domestic energy markets," said David Muir, business manager of Advanced Motor Controls. "With UL-508A certification, our energy customers and their electrical suppliers can be confident that our heat trace panelboards include only UL-listed components and comply with all UL, NEMA, and NEC design criteria in addition to some of the fastest alarm condition response times available today."

Heat tracing maintains process temperatures for reservoirs and piping that must store or transport substances that solidify at ambient temperatures. Heat Trace Panelboards monitor electrical resistance in the heat-tracing system. Typically, heat-tracing systems include electric trace heaters, support components, and other electric heating devices that are external to the Heat Trace Panelboard. When the HTP detects an impedance change, it triggers a response of the external components in the heat-tracing system.

Advanced Motor Controls offers two lines of Heat Trace Panelboards: our ProCS™ Series and the ProC™ Series. The ProCS™ Series, our flagship product, uses a solid state programmable microprocessor-based HTP, resulting in fewer nuisance trips for better control during auto tune and setup, improved monitoring accuracy, and faster response times, all while simplifying the installation of high-circuit-count panels for "plug-and-play" operation. Many Heat Trace Panelboards are installed in isolated locations with long cable runs that result in normal ground resistance of 5 to 20 mA, just below trip levels for a standard 30-mA circuit breaker,

which makes the ProCS™ Series a perfect solution. For shorter runs and more simplified applications, we offer an economical solution, the ProC™ Series Panelboards, which use a standard 30-mA ground fault circuit breaker.


Advanced Motor Controls' Advanced Heat Trace Panels can be fabricated as floor or wall-mounted enclosures, and include a panelboard distribution center, power distribution block, control power transformer, and microprocessor-based ground fault relay or standard 30-mA ground fault



Advanced Motor Controls offers the ProCS™ and the ProC™ Series Heat Trace Panelboards.

circuit breaker. The panel has options for an integrated main circuit breaker, main contactor, alarm relay, alarm horn, door disconnect, hand/off/auto selector switch, and push-to-test lights on the panel front. Taken together, these features mean that Advanced Motor Controls' Heat Trace Panels offer advanced features common to high-priced panelboards with minimal cost and lead-time.

Advanced Heat Trace Panels come in a variety of NEMA-rated enclosure types, including NEMA 1, 3R, 4, 4X, and 12. In addition to these stock solutions, Advanced Motor Controls also can build custom panelboards to a specific user's electrical service requirements.

Advanced Motor Controls' Advanced Heat Trace Panels are available immediately with an average lead-time of less than four weeks for standard panelboard configurations. For more information, contact Advanced Motor Controls at 972-579-1460, by email at dmuir@advancedmotorcontrols.com, or visit www.advancedmotorcontrols.com/heat-trace-panel-boards.htm. 

Understanding Arc-Flash, Arc-Blast Physics Can Save Your Life

Continued from page 1

Electricians, maintenance personnel, and inspectors are the authorities, however. There is no pass for them. And that means they better know the causes of an arc flash, the difference between arc flash and arc blast, and how to mitigate the dangers from both conditions if they want to succeed at their job and look forward to a happy retirement.

In 1982, IEEE Life Fellow Ralph Lee wrote the seminal arc-flash paper, “The Other Electrical Hazard: Electric Arc Blast Burns.” In it, Lee tells us that arc flashes are caused by poor electrical contacts or insulation between an energized piece of metal and some other conductor. Unlike a plasma, which solely uses ionized oxygen or trace gas molecules in the air to conduct electricity between two points, an arc flash is carried by the vaporized (and ionized) metal molecules at a temperature of 35,000°F, or approximately four times the temperature of the sun’s surface.

Also, the heat from the arc flash causes atmospheric gases to expand at a furious rate, resulting in a peak pressure of up to 2,100 psi at the source of the arc flash. According to bomb studies conducted by the U.S. Department of Defense, 10 psi is sufficient to turn a person’s insides into various types of fatal goo.

The National Fire Protection Association’s (NFPA) 70E, also known as the National Electrical Code (NEC), Tables 130.7(C)(9-11), define hazard risk categories (HRCs) for various classes of equipment, as well as what level of PPE employers need to provide to employees based on the minimum arc thermal performance value (ATPV). A common



March 4, 2009, at the Jubail Project in Riyadh, Saudi Arabia: Three workers were removing a 480-V, molded-case circuit breaker from the bucket of an energized motor-control center (MCC) when an electrical arc flash occurred, severely injuring them. All three sustained first- and second-degree burns and were hospitalized following the accident. Myth: Switchgear is designed with arc-flash containment in mind.


mistake is to determine the HRC and therefore required PPE level based solely on the class of equipment instead of the actual 70E standard requirements, which are based on available fault current and clearing times for the overcurrent protection device (OCPD).

However, even this approach assumes that the fuse or circuit breaker will actually perform to the OEM specification. A failed OCPD or even a slow breaker will result in higher incident energies than your technician’s PPE protection when the arc-flash calculation is based solely on OEM specifications. For these reasons, the best way to determine the arc-flash danger for a given device in a given installation is to use IEEE’s standard 1584 arc-flash calculations based on actual test data for the given device at a given installation.

There’s a recurring myth that switchgear is arc-flash resistant. And while it is unquestionably safer to operate or rack a breaker or motor control with the door closed, older switchgear and panelboards were not made with built-in remote actuators and extraction/racking capabilities.

While arc-flash-resistant switchgear that complies with IEEE C37.20.7

“Guide for Testing Medium Voltage Metal-Enclosed Switchgear for Internal Arcing Faults” with remote actuation and racking/extraction is a move in the right direction, it can be prohibitively expensive to replace all your aging switchgear with new enclosures and gear. In response, the industry offers a number of portable remote actuation/extraction/racking systems that can work on virtually any OCPD or motor-control center and enclosure.

Protecting yourself and your employees from arc-flash and arc-blast dangers isn’t an option – it’s a necessity per OSHA and NEC requirements. It starts with an accurate arc-flash calculation based on real field tests, which will pay double dividends when you use that data as part of a preventive maintenance program. Unfortunately, PPE will not always protect your workers. Consider newer solutions for your technicians who perform testing, actuation, and extraction/racking operations from well outside the danger zone. Only then can you be sure that not only is your equipment in good working order, but you’ve done all you can to protect both your employees and your bottom line. 

CBS Receives ISO 9001:2008 Recertification

This important standard ensures that customers receive a quality product the same way every time while allowing Group CBS affiliates to be competitive in the marketplace.

CIRCUIT BREAKER SALES has received recertification for the ISO 9001:2008 standard. The designation establishes minimum business practices for the production and delivery of products and services through the implementation of a formal quality management system that ensures customer requirements are consistently met.


“CBS’s ISO 9001:2008 compliance

ISO 9001 is “not just a badge to be worn; it is a set of standards to be followed,” Briley notes, adding that the designation is quickly sweeping the world as an international standard. “Those companies who ignore ISO 9001 will be left behind. The advantages far outweigh the disadvantages if a company strictly follows the ISO 9001 guidelines. Being ISO

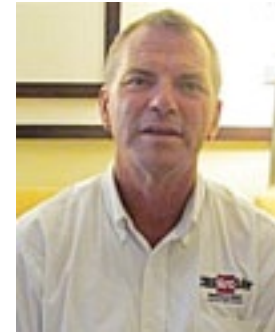
“ISO 9001 is not just a badge to be worn; it is a set of standards to be followed. Those companies who ignore ISO 9001 will be left behind. ... Being ISO 9001 certified means following the guidelines to build a competitive company in a global economy.”

ensures that customers will receive a quality product the same way every time,” explains Mike Briley, Circuit Breaker Sales’ ISO/safety manager. “Companies strive for a total quality system because quality is what the customer demands. What’s more, both internal and third-party audits eliminate the need for customers to come to our facilities to do their own compliance checks on our system.”

9001-certified means following the guidelines to build a competitive company in a global economy.”

Two other Group CBS companies—Vacuum Interrupters, Inc. and CBS Store—have ISO 9001:2008 certifications as well. Briley currently is working with Advanced Motor Controls to attain the designation by year’s end. CBS also holds ISO 14001:2004 certification, an environmental management standard. 


Tim Kelly Joins CBS ArcSafe as Northeast Field Sales Rep



CBS ARCSAFE is pleased to welcome Tim Kelly as its new Northeast field sales representative. Kelly, an expert in the Northeastern utility, industrial, and government sectors, brings 25 years of experience in the switchgear and circuit breaker marketplace to his new position. He previously serviced the electrical industry in the Northwest United States.

“We are very excited to have Tim join CBS ArcSafe,” says Ashley McWhorter, president of CBS ArcSafe. “With his strong technical background and experience, he will bring a lot of good opportunities to ArcSafe in the Northeast region. We will get to learn from him, as we always enjoy adding a quality asset to our team.”

“I look forward to this new opportunity with CBS ArcSafe and am excited to expand my territorial responsibilities,” Kelly adds.

Kelly will be based out of New Milford, Conn., where he lives with his wife and three children. He can be reached at 203-788-9149 or tkelly@cbsarcsafe.com. 

Other reasons why a company may seek a quality system include:

- Ensuring that products and services provided meet customer requirements
- Ensuring consistency in day-to-day operations
- Ensuring that processes are repeatable and predictable
- Allowing the company to create and retain satisfied customers
- Improving efficiency, reducing operating cost, and minimizing unproductive time

Vacuum Interrupter Tests Can Finally Predict Remaining Field Life

The MAC test offers a new way to attain accurate vacuum measurement in the shop or field.

By Finley Ledbetter

VACUUM INTERRUPTERS (VI) have widely replaced older air-magnetic and oil interrupters for circuit breakers rated at 1 kV or higher. These devices offer up to 10 times the expected lifetime than newer SF-6 gas interrupters.

Unfortunately, nothing lasts forever. The 20-year manufacturer's original suggested life has generally been ignored by users. This has placed a large portion of the U.S. industrial and utility distribution switchgear at risk of failure.

Only through diligent testing and some luck can users expect no events to occur in the future. No one suggests that ignoring this possible failure is acceptable. And every VI will fail; we just do not know when. Luckily, there are several traditional and one new field testing methods for verifying the isolation capability of your VI-protected circuit breakers and motor controls. Let's look at them in greater detail.

Vacuum Interrupter Test Methods

The following tests are among those that are most commonly applied by manufacturers when a VI is manufactured and/or when it ships to a customer. These tests may be performed on an entire batch of new VIs or — more commonly — on a statistically significant sampling taken from the new batch. The three that are dis-

cussed are related directly to the service life of the VI. Of the three factory tests detailed here, only two have been used in the field — the contact-resistance test and the high-potential test. Neither of these is able to determine the vacuum pressure inside the VI.

Contact-Resistance Test

A micro-ohmmeter is applied to the closed contacts of the VI, and the resistance is measured and recorded. The result is compared to the design and/or the average values for the other VIs in the same run.

High-Potential Test

A high-potential voltage is applied across the open contacts of the VI. The voltage is increased to the test value and any leakage current is measured. Factory testing may be done with either AC or DC high-potential test sets. DC is less commonly used because high DC voltages can generate x-rays when they are applied across a vacuum contact.

The high-potential test is a go/no-go result, and even a DC high-potential test set will not give predictable results that can be used. The DC high-potential test results may show a gradual decrease in resistance over time, but it is not sufficient to determine when, or if, the gas pressure

has dropped to critical levels — at least not until the interrupter fails.

As previously noted, the pressure inside a VI will increase with time. There always will be some leakage in even the best-made VI. That leakage may be slow enough that the VI will meet or even exceed the manufacturer's predicted service life. On the other hand, unexpected increases in the leakage rate can greatly shorten its life.

Leak-Rate Test (MAC Test)

Based on the long-used factory leak test, a new field test is successfully being used to measure the vacuum pressure on service-aged VIs. This test is based on the Penning discharge principle, which states that when a high voltage is applied to open contacts in a gas and the contact structure is surrounded with a magnetic field, the amount of current (ion) flow between the plates is a function of the gas pressure, the applied voltage, and the magnetic field strength.

The test equipment that is used to test vacuum in a VI is called a magnetron. Until recently, technical and logistical problems have prevented the use of magnetrons in the field. With industry improvements in components and manufacturing capability, magnetrons such as the one shown in Figure 1, are now coming

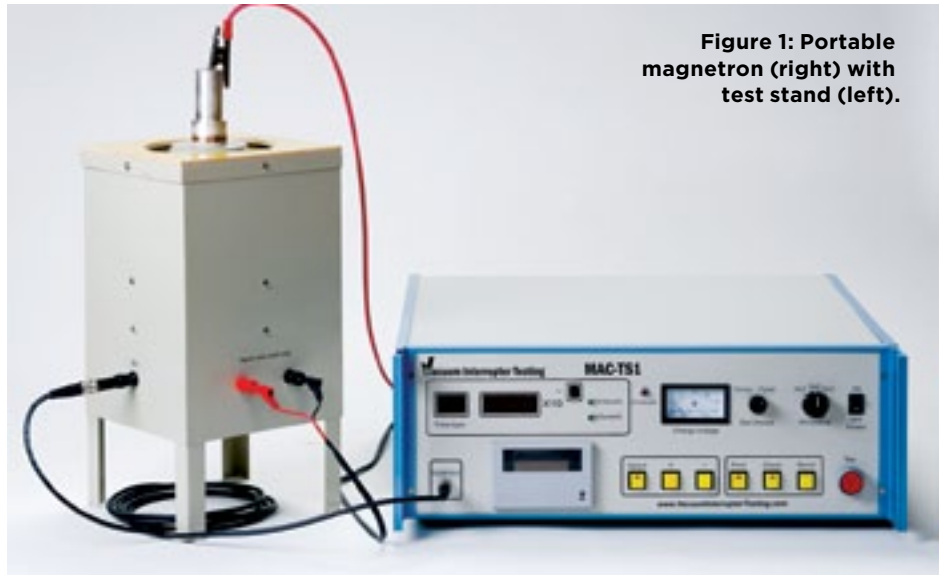


Figure 1: Portable magnetron (right) with test stand (left).

onto the market for field use. It is small and portable and will retain calibration with only the normal procedures as specified in industry standards for field testing.

The field is created by a DC current and remains constant during the test. A constant DC voltage, usually 10 kV, is applied to the open contacts, and the current flow through the VI is measured. Since the magnetic field (DC) and the applied voltage (DC) are both known, the only variable remaining is the pressure of the gas. If the relationship between the gas pressure and the current flow is known, the internal pressure can be calculated based on the amount of current flow.

First Predictive Field Tests for Vacuum Interrupters

Since removing the VI from its breaker is time-consuming and may lead to errors, flexible magnetic field coils (FMFC), such as those shown in Figure 2, have been developed. This specially designed coil is shown wrapped around the VI itself — a method not physically possible on all vacuum breakers. Placement of the coil to create reproducible, accurate results. Further research has shown that the FMFC also can be used around one or more field pole assemblies as shown in Figure 3.

Using the magnetron in the field allows the VI vacuum pressure to be tested every time field-testing is performed. The tested pressure value, along with other relevant data, is entered into a modern CBM diagnostic and predictive algorithm. The algorithm evaluates the results and develops a highly accurate evaluation of the current data to previous data, and calculates expected future values for life prediction purposes.

Any statistical analysis package, such as a CBM process, requires a histori-



Figure 2: Flexible magnetic field coils.



Figure 3: FMFC applied around entire pole.

cal data set to work properly. Since MAC testing is relatively new to field maintenance, the process is still early. Because

The algorithm evaluates the results and develops a highly accurate evaluation of the current data to previous data, and calculates expected future values for life prediction purposes.

of the large number of different manufacturers and models of VIs, developing individual curves for each vacuum interrupter will be a laborious task. Curves for a large number of the more common VIs are currently being developed, and curves for any VI can be developed on request. However, research shows that the vacuum versus current relationship strongly correlates to the geometry of the VI. It has been seen that accuracies of +/-10% are realized when curves are developed solely on the basis of VI diameter. This relationship has allowed the development of six or possibly seven generic curves that can be used

successfully in determining the vacuum in most vacuum interrupters in service today.


However, data is being collected, and the comparison of collected data to previous maintenance areas (such as the evaluation of insulating liquid) is very promising. In only a few years, we expect to see a marked improvement in maintenance efficiency and a reduction in the number of unexpected failures of vacuum interrupters.

Conclusion

Thousands of medium-voltage power circuit breakers have passed through service shops and the hands of credible testing companies. When these breakers were returned to their owners, many thought that they were guaranteed to last until the next maintenance cycle. This is not true.

When breakers are maintained and tested using traditional methods, they go back into service with only one guarantee: This device will function today.

Many of these have failed or will fail before the next scheduled maintenance cycle. This is a problem we have been working to solve for more than 10 years.

With the addition of the MAC test in the field, this is no longer the case. 

WES Restructures Management Team to Address Continued Growth

By Craig Archer, President, Western Electrical Services, Inc.

IN RESPONSE to significant growth over the last several years, Western Electrical Services (WES) has hired new talent to continue meeting our customers' needs. But like any company that experiences a rapid rise, WES has experienced growing pains.

Throughout the course of our growth, we've recognized the need for an organizational revamp. The current management structure does not allow for consistency in all locations, accountability has been too subjective, locations were becoming isolated from one another, and support from other locations was becoming more territorial.

In order to maintain and expand upon our success, WES has reorganized its management team to allow managers to better evaluate resources, job profitability, and other company processes. The restructure also has resulted in these changes:

- Clarification of reporting lines for the Apparatus division
- A new divisional leader for the Field Service division
- Creation of a Business Development department that will take the lead on all sales and marketing efforts
- A new separate Engineering division to bring more focus on true engineering services


Management changes include:

Dan Hook, EVP, Business Development: Responsible for all sales and marketing efforts, new business, new markets, and strategic opportunities.

Rob Coomes, VP, Engineering division: Responsible for all engineering studies, such as short circuit, coordination, arc-flash-hazard analysis, etc; field-service support for Intermountain Region; and overall field support from an engineering perspective.

Tony Asciutto, VP, Field Services division: Responsible for all aspects of field services from operations, cost and profit, and equipment and manpower resources, as well as assisting with customer and project-specific sales and marketing efforts.

Matt Zemanek, VP, Apparatus Services division: Responsible for operation, resources, and cost and profit for Sumner and Phoenix apparatus service shops; also supports apparatus repair and upgrade services in the field.

With everyone working together, Western Electrical Services, Inc. is poised for a great future. 

WES Becomes PEARL Full Member


By Craig Archer

WES IS PLEASED to announce that it has become a Full member of the Professional Electrical Apparatus Recyclers League (PEARL). As a Full member, WES must meet PEARL's strict technical, safety, and operational requirements to ensure the proper recycling and reuse of electrical power equipment.

"Western Electrical Services has always been focused on providing end-to-end solutions for our electrical customers, from testing to repair and retrofits," says Dan Hook, executive vice president of business development for WES. "Becoming a PEARL Full

member in addition to being a certified NETA Accredited Company (NAC) tells our customers that WES adheres to the

highest standards for its field-testing operations, as well as its shop repair, retrofit, and upgrade services."

WES specializes in the maintenance, repair, and testing of switchgear, circuit breakers, and other electrical equipment. WES's capabilities in manufacturing, remanufacturing, retrofitting, reverse engineering, and replacement parts can economically extend the life of electrical apparatuses. With offices in four locations in the western U.S., WES serves customers in Arizona, Washington, Oregon, Utah, Idaho, Nevada, and western New Mexico. 

U.S. Steel Manufacturer Turns to WES for Magne-Blast On-Site Rebuilds

When no one else would take the job, WES steps forward to save the day.



Left: WES's manufacturing capabilities were on full display when it rebuilt all cubicles for more than a dozen Magne-Blast circuit breakers for a U.S. steel manufacturer. **Right:** GE Magne-Blast AM 13.8-750-2H 2,000-amp with VCP-WR element air-magnetic circuit breaker that has been vacuum retrofitted.

A U.S. STEEL manufacturer recently planned on taking its hot-strip steel processing line down for seven days of maintenance. During that week-long period, plant electricians and outside contractors would perform numerous equipment checks and upgrades, including electrical testing and repairs of GE Magne-Blast circuit breaker cubicles that fed a hot-strip steel processing line.


Before the outage, the manufacturer put out the bid to three companies. One declined to work on the project, while another said parts were virtually impossible to come by, but they would test and repair what they could. But thanks to extensive Magne-Blast part inventories and in-house machining and manufacturing capabilities, WES was able to rebuild all 14 cubicles for more than a dozen Magne-Blast AM 7.2-500 1,200-amp and 2,000-amp circuit breakers.

"The vertical-lift GE Magne-Blast cubicle elevating mechanisms were causing misalignment and damage when breakers were elevated into the connected position," explains Craig Archer, president

of WES. "At times they would hang up, and plant personnel would not be able to remove the breakers. This would require them to de-energize the entire lineup to get the breaker out of the cubicle. WES went in with prior proven components manufactured in our Seattle facility and rebuilt all elevating mechanisms."

When gears, shafts, and elevating motor parts were not available, WES technicians reverse engineered the defective parts and either modified off-the-shelf components or manufactured the necessary parts from steel blanks.

"We manufactured gears/shafts in our machine shop facility in Seattle, then shipped them overnight to the job site," says Ryan Herbst, SW apparatus supervisor at WES. "All new miter, spur, and pinion gears were manufactured or final machined in our Seattle facility prior to mobilizing to the job site for the rebuilding of the cubicles. All shaft bearings were replaced with off-the-shelf dimensionally matched bearings.


"They gave us seven days to do the job," Herbst recalls. "We did it in five." 

WES Hires Justin Sandlin for Intermountain Region Sales



WESTERN ELECTRICAL SERVICES is pleased to welcome Justin Sandlin to support our Intermountain Region sales efforts. Justin has been in the electric power industry since 1989. A resident of the Denver area for 13 years, Justin has worked for EATON, ABB, and Arizona Electrical Apparatus.

"I am really excited to have Justin onboard," says Dan Hook, executive vice president of business development for WES. "He brings in-depth knowledge of the market and customers who are on the fringe of our current service area. His efforts will allow for WES's continued expansion to cover all of the western U.S. as our name promises."

Justin's services are available to any Group CBS company that needs help in the Intermountain Region. Contact him at 888-395-2021 (office), 303-517-3266 (mobile), or via email at jsandlin@westernelectricalservices.com. 

How to Get Up and Running After a Hurricane

Mother Nature can throw a lot at you during a hurricane, but Circuit Breaker Sales & Service can get you back up and operational in a hurry. **By Cristy Crews, General Manager, Circuit Breaker Sales and Service, Inc.**

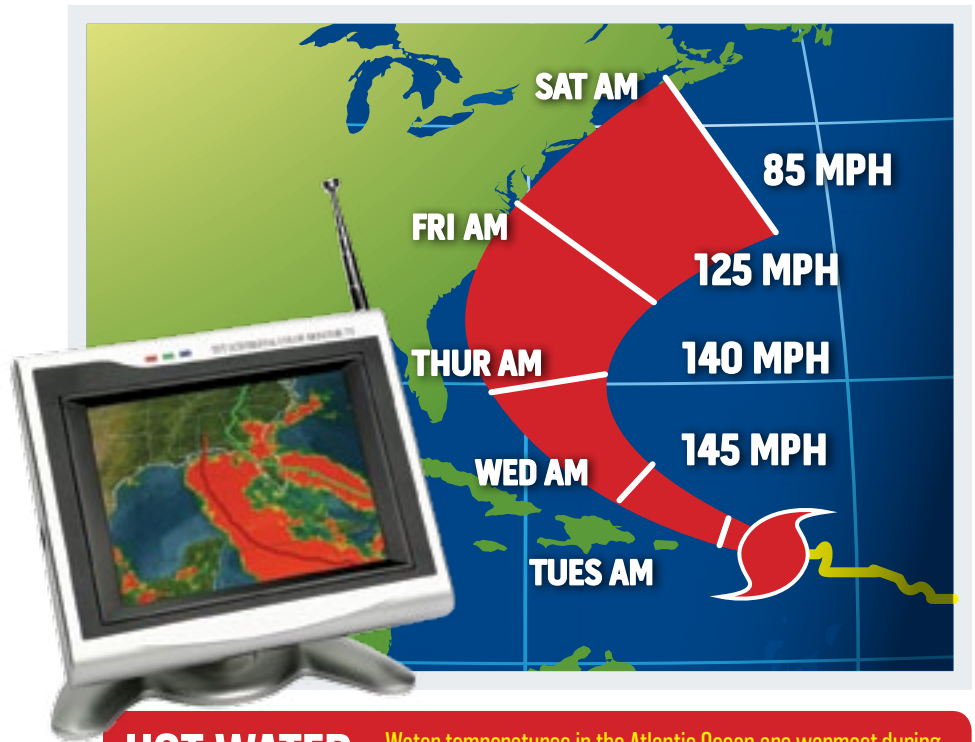
ELECTRICAL EQUIPMENT exposed to water can be extremely dangerous if re-energized without proper reconditioning or replacement. To help guide your restoration efforts after hurricanes or other water-related events, Circuit Breaker Sales & Service (Lakeland, Fla.) offers this "Recondition/Replace" guide based on NEMA guidelines.

REPLACE:

- Molded-case circuit breakers
- Fuses
- Electronically controlled and solid-state contactors and starters
- Components containing semiconductors and transistors
- Overload relays
- All dry-type transformers regardless of kVA ratings
- All dry-type control circuit transformers
- Any wire or cable listed for dry locations only, such as type NM-B cables, should be replaced if exposed to water.
- Any cable that contains fillers – such as polypropylene, paper, etc – should be replaced if the ends of the product have been exposed to water.
- GFCIs and surge protectors
- Lighting fixtures

RECONDITION:

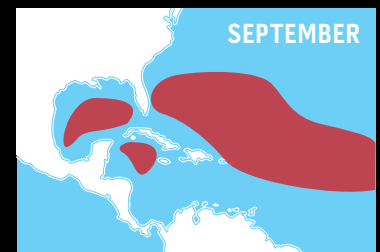
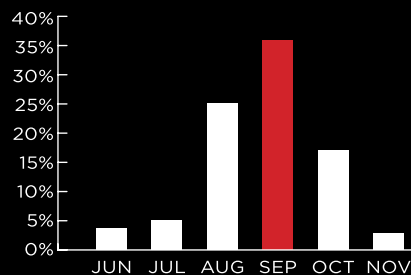
- Enclosed switches
- Busway
- Panelboards and switchboards
- Manual and magnetic motor controllers
- Motor-control centers
- Alternating current high-voltage circuit breakers
- Low-voltage power circuit breakers
- Protective relays, meters, and current transformers
- Low-voltage switchgear
- Medium-voltage switchgear
- Liquid-filled transformers (*Analysis of the insulating medium is required for evaluation of this equipment.*)
- Cast-resin transformers
- Fire pump controllers
- Motors



HOT WATER

Water temperatures in the Atlantic Ocean are warmest during September. Most hurricanes occur during this month.

Typical Hurricane Frequency by Month



Typical Tropical Storm Formation Zones

Got Hurricanes? Call Circuit Breaker Sales & Service

IF YOUR FACILITIES have been hit by a major storm, Circuit Breaker Sales & Service offers on-demand 24-hour emergency power system service throughout the state of Florida. As part of Group CBS, we have access to the nation's largest inventory of switchgear and circuit breakers from all major manufacturers dating back to the 1940s. CBS&S can provide in-shop and on-site services for power systems ranging from 480 V to 69 kV. Equipped with a fleet of service vehicles and test equipment operated by experienced technicians and engineers, CBS&S will send our team to promptly and efficiently resolve your electric power system problems—at any time, in any weather.

OPEN HOUSE in LaPorte, Texas

CBS&R Hosts Customer Appreciation
Crawfish Boil in May 2013



Blane Hunt from CBS&R customer Air Liquide

Circuit Breaker Sales & Repair facility



Finley Ledbetter, CEO and Chief Science Officer of Group CBS, and Julia Neves, Vice President & Operations Manager of Vacuum Interrupters, Inc.



Ray Kinney, President and CFO of Group CBS



Circuit Breaker Sales & Repair management and staff, from left to right: Lee Heine, Israel Sosa, Tre Ponce, Roger Vogel, and Tom Brawner



CBS ArcSafe race crew team members (right) are excited to get a closer look at the CBS race car (left).



Vacuum Bottle Engineering Expert Joins Vacuum Interrupters, Inc.

Continued from page 1

(GE) Edison Engineering Development Program, in which he explored advanced concepts in vacuum dielectrics and vacuum arc interruption at GE's Schenectady, N.Y., facility.

After subsequently earning an advanced Master of Science in Electrical Engineering degree at Drexel University, Toney spent much of the next 22 years at GE's Burlington, Iowa, facilities, developing and testing more cost-efficient interrupter designs. Eventually, Toney assumed responsibility for all technical aspects of GE's vacuum interrupters before retiring from the company in spring 2013.

In his new position, Toney will provide design and manufacturing oversight of vacuum interrupter replacements and components, and continue development of the Vacuum Interrupters flagship testing systems, the TS-1 and TS-2, which include the electrical industry's first field-testing system that uses magnetron atmospheric condition (MAC) testing.

Please welcome John Toney to the Group CBS family. He can be reached at jtoney@groupcbs.com.

GCBS COMMUNITY

CBS Gives Back to Oklahoma Tornado Survivors



When Circuit Breaker Sales heard that a local church was going to make a trip to the Moore, Okla., area to help out victims of the May 20 tornado, we sprang into action. CBS teamed up with First Baptist Church of Gainesville, Texas, which delivered food, water, baby diapers and formula, and other supplies to those who suffered from the storm.

GROUP CBS AFFILIATES

Advanced Motor Control, Inc.

www.AdvancedMotorControls.com
Irving, Texas — Ph: 972-579-1460

Supplies electrical equipment, upgrade retrofits, and life-extension services to commercial and industrial customers.

Astro Controls, Inc.

www.AstroControls.com
Irving, Texas — Ph: 800-289-2757

Sales and service for all types of industrial molded-case circuit breakers, insulated case circuit breakers, and motor controls.

CBS ArcSafe, Inc.

www.CBSArcSafe.com
Denton, Texas — Ph: 877-4-SAFETY

Remote racking systems, remote switch actuators, and handheld motorized racking tools for low- and medium-voltage switchgear.

CBS Nuclear Services, Inc.

www.CBSNuclear.com
Matthews, N.C. — Ph: 704-882-1875

Specializes in shop and on-site field servicing of Class 1E safety-related low- and medium-voltage switchgear and circuit breakers. Also services industrial and non-nuclear-related circuit breakers and related switchgear and substations.

CBS Power Products, Inc.

www.CBSPowerProducts.com
Dallas, Texas — Ph: 940-665-4444

New alternative utility and industrial power products: transformers, switchgear, and other power apparatuses.

Circuit Breaker Analyzer, Inc.

www.CircuitBreakerAnalyzer.com
Addison, Texas — Ph: 972-290-0074

The CBAAnalyzer™ system uses vibration analysis combined with Internet data transfer and sophisticated condition-based analysis to determine the condition of all types of circuit breakers.

Circuit Breaker Sales Co., Inc.

www.CircuitBreaker.com
Gainesville, Texas — Ph: 800-232-5809

World's largest inventory of low- and medium-voltage circuit breakers. Millions of parts in stock. Complete service, remanufacture, upgrade, and life-extension services. Match existing switchgear lineup.

Circuit Breaker Sales & Repair, Inc.

www.CBSalesAndRepair.com
Houston, Texas — Ph: 281-479-4555

Servicing the Gulf Coast with shop or field service, repair, upgrade, or replacement of power system apparatus.

Circuit Breaker Sales & Service, Inc.

www.cbs-florida.com
Lakeland, Fla. — Ph: 863-646-5099

One-stop service for circuit breakers, switchgear, transformers, protective relays, loadbreak switches, motor controls, unit substations, and renewal parts, as well as repair, upgrade, life extension, and maintenance services.

Circuit Breaker Store, Inc.

www.CircuitBreakerStore.com
Denton, Texas — Ph: 855-227-8673

Your online source for all Group CBS products, a powerful solutions provider with a specialty vendor network that can supply factory new, surplus new, and reconditioned circuit breakers, electrical distribution, control equipment, parts, and remote racking equipment.

Reliable Electrical Testing Services, LLC

www.ReliableElectricalTestingServices.com
La Porte, Texas — Ph: 713-254-0006

On-site commissioning and acceptance testing of new installations and apparatuses; or maintenance, troubleshooting, repair, and electrical testing of existing systems. Also professional electrical power engineering services to ensure the reliable, safe operation of electrical systems.

Sentinel Power Services, Inc.

www.SentinelPowerServices.com
Tulsa, Okla. — Ph: 800-831-9550

Sentinel Power Services is an electrical power service company servicing the central U.S with electrical engineering studies; on-site electrical testing, preventive maintenance and repair services; and repairing, building, and installing electrical power systems.

Solid State Exchange & Repair, Inc.

www.SolidStateRepair.com
Denton, Texas — Ph: 877-874-7349

Quality, reliable, on-time service and support for all brands and types of solid state power electronics including circuit breaker trip devices, protective relays, motor overload relays, and rating plugs.

Transformer Sales Co.

www.TransformerSales.com
Gainesville, Texas — Ph: 940-665-4484

Offers a complete line of new, surplus, and reconditioned dry type, cast coil, and liquid-filled power transformers from 1,000 to 5,000 kVA with primary voltages from 2,400 volts to 34.5kV.

Vacuum Interrupters, Inc.

www.VacuumInterruptersInc.com
Carrollton, Texas — Ph: 214-442-5877

Provides replacement vacuum interrupters (vacuum bottle interrupters) for virtually any manufacturer's medium-voltage circuit breaker or contactor.

Western Electrical Services, Inc.

www.WesternElectricalServices.com
Phoenix, Ariz. — Ph: 888-395-2021

Serving the Southwest with superior quality on-site electrical testing, maintenance, and repair services, as well as rebuild, upgrade, and life extension services for switchgear, circuit breakers, and motor control.

Western Electrical Services, Inc.

www.WesternElectricalServices.com
Salt Lake City, Utah — Ph: 888-395-2021

The only full-service electrical testing and maintenance company in the Intermountain Region.

Western Electrical Services, Inc.

www.WesternElectricalServices.com
Sumner, Wash. — Ph: 888-395-2021

The Northwest leader in electrical testing, maintenance, and power switchgear services providing on-site electrical testing and maintenance, electrical engineering studies, and sales, repair, upgrade, and life extension services of circuit breakers, switchgear, motor control, and transformers. Also custom manufacturing of engineered and reverse-engineered parts.

Western Electrical Services, Inc.

www.WesternElectricalServices.com
Vancouver, Wash. — Ph: 888-395-2021

Utility class service provider to the Northwest T&D market.

