

HUBBELL[®] TIPS & NEWS

www.hubbellpowersystems.com

Vol. 11 No. 2 AUGUST 2006



Quazite®

UNDERGROUND ENCLOSURES AND PADS



STRONGEST

AND SAFEST

ON THE

MARKET

With manufacturing facilities in Lenoir City, TN and San Jose, CA, Quazite (formerly a brand of Strongwell Corporation, Bristol, VA) is the newest member of Hubbell Power Systems (HPS). Quazite manufactures a complete family of quality precast polymer concrete products that includes enclosures that allow easy access to electrical underground service as well as pads (SPLITT-PAD®) for supporting transformers and pad-mounted switches. In addition to supplying products to electric utilities, Quazite serves the telecommunications, transportation, fiber optics, CATV, water and gas industries.

Since 1971, Quazite polymer concrete enclosures and pads have been manufactured from selectively-graded aggregates in combination with a polymer resin system. When combined through a process of mixing, molding and curing, an extremely powerful cross-linked bond is formed and reinforced with fiberglass for the exceptional strength and rigidity found with Quazite products.

Offering many advantages over concrete, (light weight 1/10 to 1/3 the weight of concrete), Quazite products are easy to handle requiring no special installing equipment. High-strength Quazite products have compressive, flexural and tensile strengths three to five times



higher than traditional concrete (impact resistance tested per ASTM D-2444). Our enclosures and pads resist alkalines, acids, weathering and other forms of deterioration. Non-flammable. Non-conductive. Freeze resistant, too.

Quazite customers know our products have undergone rigorous physical, environmental and internal equipment protection tests and have been found by Underwriters Laboratories (UL), a third neutral party, to meet the test requirements of the ANSI National Standard “*Specification for Underground Enclosure Integrity*” (ANSI/SCTE 77 2002). The

monolithic construction of our products ensures consistent quality to eliminate the possibility of thermal expansion stress cracks. On the other hand, enclosures made of dissimilar materials, however, are susceptible to cracking because each material in the enclosure has a unique coefficient of thermal expansion (CTE). When such materials expand and contract at different rates during temperature fluctuations, stresses can lead to cracking and product failure. Compromised enclosures can lead to serious problems including costly repairs, expensive lawsuits and worse.

WEAKNESSES OF OTHER METHODS

PRECAST CONCRETE	POURED-IN-PLACE CONCRETE	PLASTIC AND FIBERGLASS
<ul style="list-style-type: none"> ■ Brittle and easily damaged by impacts. ■ Porous and can absorb significant amounts of water. In freezing temperatures, the water turns to ice and breaks the concrete apart. ■ Sidewalls and covers of precast concrete enclosures must be thick to provide enough strength. Thickness increases weight, which makes enclosures more difficult to handle and install. Depending on size, special equipment may be needed for the installation. ■ Deteriorates when exposed to inorganic acids, strong alkalines, salt, equipment lubricants and other corrosive chemicals found on or near roadways. 	<ul style="list-style-type: none"> ■ Poured-in-place concrete shares the same drawbacks as precast concrete. ■ Requires significant planning and coordination of crews for installation. Forms must also be constructed and then discarded. ■ Can take traffic signal cabinet bases as long as two days to set up before the cabinet can be installed. ■ Traffic signal cabinet bases absorb the energy in the event of an accident and cause much more damage than break-away bases. 	<ul style="list-style-type: none"> ■ Plastic and fiberglass enclosures and cabinet bases do not have enough strength and durability to ensure safe, long-term performance. ■ Easily damaged by lawn care equipment, which can lead to exposure of dangerous electrical wires or delicate system components. ■ Affected by temperature extremes. Plastic can become soft in high temperatures and brittle in cold temperatures. ■ Both are subject to UV degradation.

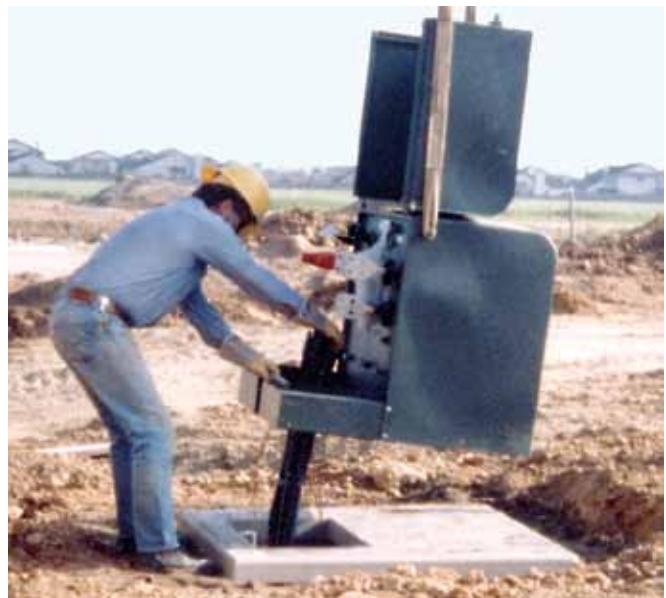
THE QUAZITE SOLUTION:

Superior Performance - Quazite enclosures and pads outperform concrete, plastic and fiberglass no matter how compared. Our products will last with little or no maintenance for years.

Cost Effective - Up-front cost of precast concrete, plastic and fiberglass are attractive at first glance, but there’s more to it. Factor in the long-term costs associated with failures, repairs, replacement and litigation from injuries, and those materials become more expensive than Quazite products. In the case of poured-in-place concrete, concrete may appear to be inexpensive, but the installation process is labor intensive, time consuming and subject to weather delays.

Quazite Lasts - Our product life cycle is longer than traditional materials thus more cost effective and trouble free over the long term. Quicker and easier to install, too.

Reduced Liability - Product failures that can expose electrical wires to the public, and you to liability are not an uncommon experience with traditional materials. Quazite product history is one of superior durability and performance that means reduced liability.



The addition of the Quazite product line to Hubbell expands the Hubbell utility product line with enclosures and pads that allow utilities to access underground lines and support pad-mounted equipment.

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Quazite handholes and underground electrical enclosures are UL listed to ANSI/SCTE 77 2002 as referenced in the NEC 2005 and meet and exceed new section 314.30 requiring handhole enclosures be designed and installed to withstand all loads likely to be imposed (see FPN ANSI/SCTE 77-2002).

Tested. Proven. Dependable.

Until recently, the lack of a national standard and the fact that enclosures are made using various materials, designs and technologies made it easy for some to make false claims about the performance and appropriate applications for their enclosures. The most responsible way to ensure the safety of the public, while minimizing your liability, is to insist on the use of underground enclosures that passed rigorous performance testing by a third party (Quazite enclosures are performance tested by UL) and are listed to meet ANSI's "Specification for Underground Enclosure Integrity" (ANSI/SCTE 77 2002). Most enclosures sized 30" x 48" and smaller are UL listed to meet the standard. ■

Test Requirements of ANSI/SCTE 77 2002 Include:

- Three-position testing on both enclosure and cover to simulate typical non-deliberate vehicular loadings
- Accelerated service per ASTM D 756
- Chemical resistance per ASTM D 543
- Simulated sunlight exposure per ASTM G 154
- Impact resistance per ASTM D 2444
- Water absorption per ASTM D 570
- Flammability resistance per RUS specification PE-35 and RUS 7 CFR 1755.910, paragraph xiii



Hubbell also markets Polycast® surface drain systems, Duraguard® non-metallic molded grating and Polyvent® foundation ventilation systems to the C&I, transportation, plumbing and industrial plant segments among other markets.

For more information, contact your Quazite representative, fax 573-682-8714 or e-mail hpsliterature@hps.hubbell.com.

Billions invested in capital equipment.. Millions in revenue per day.

and the most likely element to fail is a cheap connector

USE FARGO® HTJC Hi-Temperature & Low Resistance Joint Compound to Protect Connections

► Conductive grit & Ther- mally conductive filler.

- Reduces connection resistance 15%
- Connectors run cooler by 18%

► Also recommended for bolted connections.

- Only one inhibitor required on job site.



Improper conductor and connector preparation can wreck havoc on your system. Anderson/Fargo have the high temperature oxidation inhibitor you need to make your connections lasting and worry free. With the widest selection of high performance inhibitor compounds in the industry, our compounds are formulated for transmission, distribution, substation and service entrances. Use in compression and lug connections or pad-to-pad applications.

Anderson/Fargo High Temperature Joint Compound (HTJC) runs cooler with thermal fillers reducing temperature more than 15%. Reduces contact resistance, too, because of the fine conductive grit we use for more connection points. Synthetic base compound is formulated for 250°C conductor.

With Anderson/Fargo, you eliminate the error of choosing the wrong inhibitor in the field because there's one inhibitor for all applications. There's no waste of excess inhibitor because it works in all applications.

Anderson/Fargo inhibitors are simply the best performers on the market for reducing outages and helping create connections you can trust. For the best in oxidation protection, call us.

continued . . . ►

THE ANDERSON ADVANTAGE

VS8-HTJC

Improve Critical / High Temp Connection Performance with High Temp “AA” Oxidation Inhibitor Compound



- **ACSS Class & “AA” Thermal Withstand Performance**
 - From -40° C thru +250° C Range, ANSI C119.4 specs
 - ACSS tested thru 250° C conductor range (225° C joint)
- **Unique New Synthetic Compound:**
 - Compatible w/ all utility equipment & surfaces
 - Conductive medium for “gritted” or “non-gritted” specs
 - Use on any fixed connector contact surface
- **Improved thermal and electrical junction performance:**
 - Compression Lugs & Splices; Distribution and Transmission
 - Tees, Taps & Stirrups on any conductor
 - Pad to Pad URD, Substation and Overhead connections
- **VS8-HTJC is different:**
 - I.S.O. “Hot Surface” ACSS Class recognition symbol
 - Specialty red cap & color theme highlights extreme range
 - Full info: label, bar coding, application and safety notes
- **Easy to Apply:**
 - 8 fl. oz. bottle for precise application. No waste.
 - Cleanup with soap and water.
- **In Any Environment**
 - Wet or Dry, Hot or Cold, VS8-HTJC gets the job done
 - Apply down to -40° C; and don't worry about summer!
- **2 Convenient Package Options:**
 - 12 pack in display-ready box
 - 16 oz. (wt.) Caulk Gun Tubes available as Cat. # HTJC-16



The widest selection of high performance inhibitor compounds available to meet any need, anywhere.

Barehanding 240 kV taught in Chance[®] live-line course

Lee County Electric Cooperative committed to efficiency in system operations and line maintenance safety

At Lee County Electric Cooperative (LCEC), 10 linemen recently received barehand/hot-stick training from Chance[®] Tool Demonstrator Randy Beckes. The two-week 80-hour contracted course covered barehand work on transmission lines energized up to 240 kV.

“Being able to work on energized lines will allow us to make more timely transmission line repairs, as well as repair issues detected during infrared and corona inspections before they cause an outage,” said Frank Sherkus, LCEC Transmission Coordinator/Project Manager.

The course covered training in electrical theory, tools and personal protective equipment used in barehand procedures. Approximately one-third of the training was classroom instruction on live-line tool usage, general work rules, basic rigging techniques and safety.

The balance of the course was spent in field hands-on sessions. There, the linemen became acclimated to the actual conditions of working barehand on



energized lines. This involved the use of a Chance EHV Barehand Conductive Suit to place the worker at the same electrical potential as the conductor, somewhat akin to a bird on a wire.

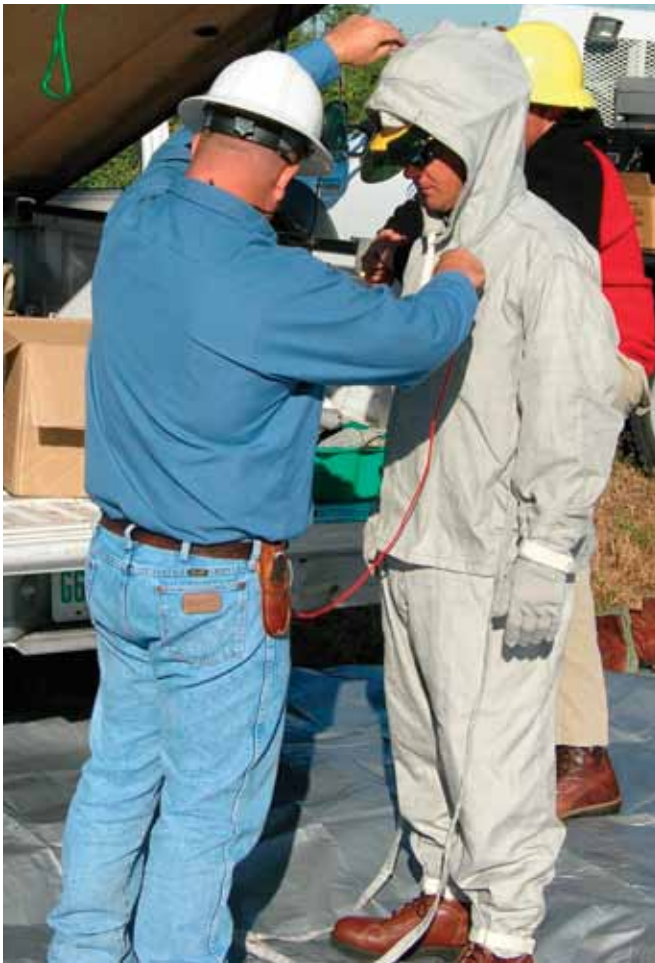
“Once you become part of the energized conductor,” Sherkus said, “you have to be very aware of your clearances. You have to think about every move that you make.”

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Lee County Electric Cooperative (LCEC) is one of the largest electric cooperatives in the U.S. with more than 6,000 miles of distribution and transmission lines and more than 300 employees.

Headquartered in North Ft. Myers, Florida, and established in 1940, LCEC is a not-for-profit electric distribution cooperative. It serves a five-county area in Southwest Florida, including Cape Coral, North Fort Myers, Marco Island, Sanibel and Captiva Islands, Pine Island, Everglades City, Immokalee and parts of Lehigh Acres.



An ohmmeter test confirms the suit's low resistance and high conductivity for the job.

This refers to what the course teaches about how to properly approach, make and break contact with the energized conductor. Such techniques are essential to attaining the protection the conductive suit offers the lineworker.

Highly specialized training and clothing

The main objective of barehand work on EHV is to allow the lineman to get closer to his work. It replaces hand tools on the end of 16-foot-long Epoxiglas® insulated poles. The clothing is bonded to the conductor, placing the lineman within the field of electricity, not as a conductor himself, and allows him to work with his hands on the conductor hardware.

For work on voltages through 765 kV, the two-piece conductive suit is made of a blend of Nomex aramid flame-resistant fiber and microscopic stainless-steel fiber. This extremely strong and low-resistance material meets or exceeds IEC 895 Specification for conductive clothing. Conductive gloves, socks and boots complete the protective clothing.

For more information, contact your Hubbell Power Systems representative, fax 573-682-8714 or e-mail hpsliterature@hps.hubbell.com.



LCEC transmission lineman makes connection to the line with a bonding clamp as instructed by Randy Beckes, Chance Tool Demonstrator.



The barehand team learns about monitoring equipment that alerts voltage leakage on the insulated truck boom.

EHV barehanding in LCEC future plans

The benefits of barehanding obviously promotes transmission line-maintenance efficiency and effectiveness without endangering the lineman and without interrupting customer service. To achieve those goals, LCEC not only engaged Chance/Hubbell Power Systems for this training, but later this year also plans to invest in an extended boom truck to permit barehand maintenance on transmission structures beyond their present reach. ■

Ohio Brass Develops Insulator for Specific Application

New polymer insulator resolves transmission line outages for ATCO Electric Ltd.

ATCO Electric Ltd., Alberta, Canada, was experiencing excessive outages on their porcelain flower pot insulated 72kV transmission lines. After a lengthy and detailed study of the problem, which included electrical, mechanical, environmental and chemical analysis, the cause was finally attributed to several factors: failing porcelain insulators, higher operating voltages, line contamination, and weather conditions.

Although ATCO tried a changeover to similarly rated polymer insulators, that did not sufficiently meet their performance needs. So, after further detailed analysis, ATCO engineers developed a specification for an insulator that would exceed the performance of the older style polymer insulators and therefore improve system reliability. However, after some initial inquiries were made in the market, it became very clear to ATCO that most insulator manufacturers could not match the new specifications.

ATCO Electric Ltd. with head offices in Edmonton, Alberta, Canada, serves approximately half of the geographic area of the province; the northern and east-central regions. It has a total of 8822km of transmission lines, including 1456km of 72kV lines. Their typical 72kV line design of a single wood pole and wood crossarm, unshielded, was fitted with post-type porcelain insulators: two on the crossarm and one on the pole-top. According to Naval Tauh, Senior Engineer, Transmission Technical Services, the 72kV system was originally designed to include the wood cross-arm as insulation. So the insulators used 20 to 30 years ago were rated at 66kV to 69kV. Tauh said, "Presently with the desire to keep transmission voltages higher and currents lower, our operating voltages are occasionally as high as 75kV. The old porcelain insulators just didn't stand up well to these higher voltages."

As the system aged, ATCO Electric started observing wood pole fires. Tauh said, "To combat the fires, we started bonding the insulators by



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connecting the insulator pins to each other on the crossarm, to pull all the pins at the same potential. However, when you bond insulators, the BIL (Basic Impulse level) is reduced because the BIL of the wood crossarm is eliminated. On our system the wood was probably providing up to 80kV/ft BIL. With contamination of the insulators from road salts used here in the winter, plus the reduced BIL, we started to have flashovers on the insulators. Once flashovers start on porcelain insulators, they keep flashing over. We tried changing out to polymer insulators available on the market, but that didn't solve the problem. We needed to get better performance of our lines, and for that we need to upgrade to a higher-rated insulator."

A new specification is written

To improve the performance of the lines, ATCO Electric started writing a new specification and looked for a manufacturer willing and capable of manufacturing an insulator for this specific application. According to Tauh, the key points the new polymer insulator specification was designed to achieve were:

- higher BIL rating
- higher creep distances
- silicone compound (for improved contamination resistance, especially because the province of Alberta had been very dry for the last few years, so there was a lack of rain to wash off contaminants
- extended life of 30 years.

A further consideration was the height of the insulator for the protection of wildlife. Some larger birds taking off from crossarms were in danger of becoming entangled and electrocuted on the live phases. Also, in dryer seasons, contamination build-up would increase the time it takes for a flashover to occur before it could be washed off by rain, snow or powerwashing.

Tauh said, "After completing the specification, a bid package was issued to manufacturers outlining ATCO's requirements for the new design. Ohio Brass and other manufacturers submitted their completed bid proposals and Ohio Brass was successful, based on meeting and/or exceeding the established criteria. Ohio Brass was willing and able to provide us with an insulator designed exactly to the new specification. Also, we knew that Ohio Brass had significant experience and an excellent



reputation, so we had great confidence in their ability to make the new insulator for us."

Design and testing:

Tauh said, "Ohio Brass developed the initial insulator design, which was further refined in subsequent meetings with Ohio Brass engineers. Part of the design criteria involved developing a detailed plan for testing and manufacturing the new insulator. In addition to the usual tests, the new insulators also had to be tested to meet CEA (Canadian Electrical Association) standards. These tests were conducted at the Ohio Brass power testing facility in Wadsworth Ohio. To ensure full compliance to the specification, the testing phase took almost 4 months to complete. The tests conducted included the following:

- water penetration
- 60 Hz flashover – withstand
- power arc, tracking and erosion
- cantilever load, and
- flammability.

Tauh witnessed some of the tests in person. "I witnessed the mechanical tests, the flashover impulse testing, the low frequency wet test and the positive and negative critical impulse flashover tests. I also had an opportunity to see some of the manufacturing process at the Wadsworth, OH, and Aiken, SC, where the insulators are produced. I was very impressed with the positive, can-do attitude of the people I met on the production floor as well as the professionalism of the engineers and sales and marketing people," he said.

Following the successful completion of the tests, samples were produced and approved and then ATCO placed their first production orders for

the new 72kV insulator. Brian L'Heureux, District Manager for Hubbell Power Systems in Alberta, said, "When the testing was finalized in June 2005, I worked with Jay Bushell, Purchasing Supervisor, ATCO Electric, to ensure our production schedule would now meet the maintenance schedule of the ATCO line crews. As part of our alliance contract with ATCO, we have certain contractual obligations that have to be met to ensure product arrives just in time to meet the demands put on purchasing by the field crews while maintaining minimal inventory at all the ATCO warehouses."

Installation:

ATCO Electric started replacing the old porcelain insulators on their 72kV lines with the new silicone-based polymer insulators. Tauh said, "We take a section of line out of service; install the new insulators and then move on to the next section. Since the summer of 2005, we have completed two lines of approximately 50km."

According to Don Fausak, Transmission Maintenance Supervisor, "We're going end to end on our 72kV system. We're changing out the whole works, line by line." In deciding which lines to work on, Fausak said, "We give priority to lines with the most problems, mostly older lines on which we hadn't done any porcelain replacements at all. Most of the work is completed deenergized, but a few lines are worked on hot if we can't get an outage. We are probably 40% complete with our change-out program."

Results:

According to Fausak, on lines where the new Ohio Brass insulators have been installed, there have been no problems at all. Tauh said, "We had one 72kV line that had over 25 outages in 2004. Because we replaced all the old porcelain insulators with the new insulators, we have had only one outage, so we know there is a vast improvement, especially since our 72kv lines are unshielded."

Jay Bushell, Purchasing Supervisor, ATCO Electric, said, "Hubbell and ATCO have worked very closely for the past 15 years and have over this time refined this relationship into a strategic alliance, whereby both parties intimately know each others business, capabilities and demands. In the alliance we have specific products that have been contracted to Hubbell Power Systems. Every 5 years we go back to the market for competitive bids and I am pleased to say Hubbell has been successful for the past 15 years. However, it's not just a matter of being competitive; a great deal of emphasis is given to selecting manufacturers who can support the full range of products in the contract thus reducing our supplier base and saving ATCO significant time and resources."

Bushell went on to say, "Over the years our purchasing and engineering staff has worked closely with Hubbell engineers, marketing and sales staff to identify new items to add to the contract. Based on our requirements over the remaining term of this contract, we also decided to add the new insulator to the contract. Hubbell Power Systems understood what we needed and worked with us to provide it. By working with us jointly to solve a problem, they further strengthened an already strong working relationship." ■



Three-phase boom lift raises work efficiency

Device puts crew, conductors and structure in proper positions

Here are six ways every material-handler truck with a boom-mounted winch can be a better tool:

- 1.** Place operator at correct work location while conductors are lifted independently of bucket.
- 2.** Monitor full time the amount of load supported by a jib accessory.
- 3.** Increase conductor-support capacity to 1,200 lb.
- 4.** Fit conventional-crossarm and armless construction.
- 5.** Reduce many two-truck jobs to just one truck (and fewer workers for the same tasks).
- 6.** Expand use of expensive vehicles and adapt to most any make on the market.



With phase conductors lifted and held at proper clearance, linemen attend to such maintenance tasks as replacing insulators or crossarm.

Confident control

The unit's complete operation remains at the operator's fingertips. This lets the truck deliver the convenience of both its in-bucket controls and boom-tip winch. With direct

access to these functions, the aerial worker can maneuver separately the bucket and boom lift into best relative positions. Safe-working clearances are easy to maintain by the very nature of the boom lift.


In terms of actual capacity, this unit outperforms other Chance units. Compared to their 1,000-lb. limits, it carries ratings for a balanced

vertical load up to 1,200 lbs. (including the tool itself) and 300 lbs. maximum vertical load per wireholder.

Just as important to safety, this design gives the operator a continual indication of the load supported. Identical scales are visible from both sides of the load monitor.

Assembly on videotape

A 9-minute video available on free loan outlines the basic procedures to train crews or preview the unit at work. The simple 3-Step instructions shown on

continued . . . 



Step 1

Jib sleeve simply assembles to load monitor with a throughbolt and retaining pin. The bolt serves as the pivot to achieve the mast angle desired. To set the angle, select from the five adjustment holes. Then just insert the pushbutton-detent pin through it and the jib sleeve.



Step 2

Removing jib head frees winch line.

Jib sleeve slides into place and secures by the same means the jib did – a detent pin through the winch housing.

Winch line then passes over a sheave and the end fastens in a clevis under the load monitor.

these pages are excerpts from the video.

By design, the boom lift works with (not just on) material handlers. To anyone familiar with using these vehicles, the device goes together, fits on and operates as you would want. There's really nothing else quite like this time- and labor-saver.

For video scheduling information, see note at end of this article.



Step 3

Vertical mast inserts through load monitor. Winch line goes around sheave at mast base. Keeper plate protects rope in the sheave groove.

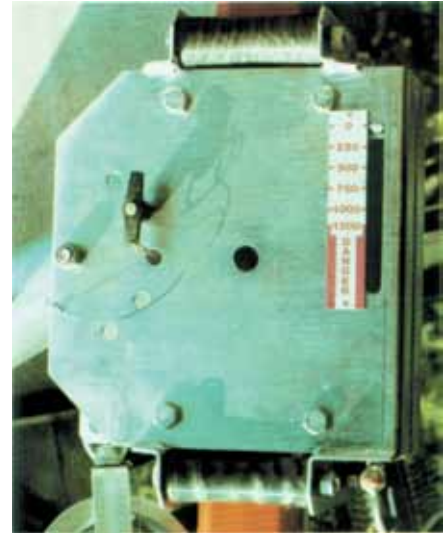
With wireholders clamped at proper phase intervals, crossarm easily mounts on mast. Groove

in fitting atop mast accepts crossarm-collar pinchbolt. This clamp/swivel feature holds securely but lets crossarm rotate to maneuver into position.

Tension on the winch line raises the assembly, now ready for action.

Versatile to field and fleet

Regarding the material-handler truck as a tool, the three-phase boom lift helps you meet the challenge of higher productivity. Whether that watchword means less equipment for the same work or smaller crew size, too, the boom lift excels.



A scale on each side of monitor displays constant readout of load uplift for easy visibility from both buckets.



Sleeve for square jib fits other brands of material handler vehicles. Notice, too, that center wireholder may be used alone for single-phase lifts.

It quickly adapts to various types of distribution construction. Just a change of conductor-support crossarms lets you work either conventional or armless.

It comes with wireholders for as many as three phases plus tangent neutral. Or, lift just one with a wireholder on the mast only.



And, it fits any brand of material handler in your fleet by just changing the jib sleeve.

For hot-line work, the three-phase boom lift gives you unique advantages whether your bucket procedures are by hotstick or rubber gloves. And it can double as a jib accessory to make your de-energized construction and maintenance more efficient, too. ■

For armless construction, shorter crossarm mounts midway with single wireholder at top of mast. Notice, too, that center wireholder may be used alone for single-phase lifts.



For more information, contact your Hubbell Power Systems representative, fax 573-682-8714 or e-mail hpsliterature@hps.hubbell.com
To check out a copy of the video, request No. 5 in 1/2" VHS tape or CD.

Experience other utilities' success with Sectionalizers

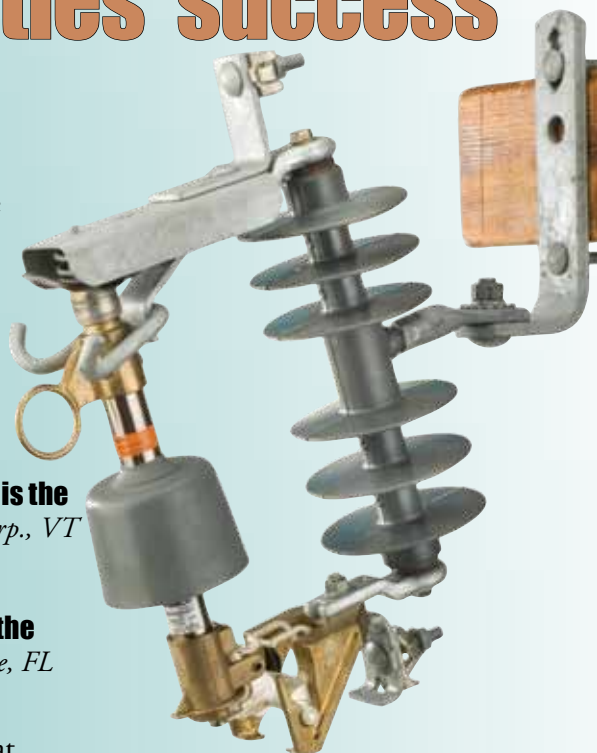
Check out two case histories just posted on our Web site to see how Sectionalizers can:

- Boost service reliability
- Cut operating costs
- End nuisance outages

“For these situations, the cutout-mounted Electronic Sectionalizer is the perfect solution.” *Josh P. Castonguay, E.I., Green Mountain Power Corp., VT*

“... came upon an open Sectionalizer, they knew it was caused by a permanent fault, because the Sectionalizer already had eliminated the nuisance outage.” *David Kirkland, Engineer, Clay Electric Cooperative, FL*

You may download and/or print these case histories from the Web only as Bulletins 10-0601WB and 10-0602WB. Find them easily at www.hubbellpowersystems.com in Literature for Chance Construction, Switching and Protection Products. For other Sectionalizer literature and Catalog sections 10D (porcelain) and 10DD (polymer), you may download from the Web and/or request hard copies by any of the means listed below.



For more information, contact your Hubbell Power Systems representative, fax 573-682-8714 or e-mail hpsliterature@hps.hubbell.com.

NOTE: Because we have a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

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Your suggestions and editorial or photographic contributions are invited and may be submitted to **Hubbell TIPS & NEWS**.

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