

Every Millisecond Counts: GE Announces Arc Vault™ System to be Fastest Arc Flash Containment Technology in the Industry

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A breakthrough arc protection technology called Arc Vault™, being developed by GE Consumer & Industrial's electrical distribution business for delivery in mid-2010, will stop an arcing fault in less than eight milliseconds (ms) to provide increased arc flash hazard mitigation with equipment doors open or closed – the fastest arcing fault containment technology in the industry – helping to reduce work-related injuries, fatalities and lost productivity.

The announcement about the Arc Vault™ system was made today in front of about 1,000 electrical experts meeting at the 2009 IEEE IAS (Institute of Electrical and Electronics Engineers' Industry Applications Society) Petroleum and Chemical Industry Technical Conference, in Anaheim, California.

"We're ecstatic our outside-the-box thinking led to inside-the-box results for the Arc Vault™ system," says Paul Foody, general manager, product management for GE Consumer & Industrial's electrical distribution business. "Safety-conscious plant managers and consultants dealing with applications such as oil and gas, industrial process, healthcare, and data centers, will welcome this arc protection technology that specifically addresses the arc flash hazard identified by the IEEE 1584 and NFPA 70E standards covering arc flash protection in the workplace."

Electrical shock and burn were responsible for the deaths of 2,287 U.S. workers and lost productivity from another 32,807 American employees during a seven-year period beginning in 1992 – nearly one fatality every day of the year – according to a study by the Department of Labor's Bureau of Statistics. Non-fatal injuries, 38 percent classified as electrical burns, caused an average of 13 days away from work.

"When you're dealing with safety, every millisecond counts," says Foody. "With containment times of 50ms to 100ms, other systems in the industry will seem slow compared to the Arc Vault system."

To view a video that shows how the Arc Vault™ system works, visit <http://www.youtube.com/gearflashinnovation>

How the Arc Vault™ System Works

Developed over the past five years, the Arc Vault™ system started with a simple idea: contain arc fault energy more quickly to reduce the impact of the arc flash event on workers and equipment.

The Arc Vault™ system will contain an arc fault in less than eight milliseconds with the circuit breaker compartment doors open during operation and maintenance. The incident energy, in accordance with IEEE 1584 at 24 inches from the arc event, will be less than 1.2 cal/cm² with the equipment doors open or closed. This is equivalent to HRC0 for a 480V High Resistance Grounded system with available fault currents up to 100 kA.

Traditional arc resistant switchgear provides protection as long as all circuit breaker compartment doors are closed. If an arc flash event occurs, the energy is exhausted away from the area by using a chimney or plenum. Traditional arc resistant switchgear provides less protection when the circuit breaker doors are open as they are during much routine maintenance.

Optimized specifically for low voltage applications, the GE Arc Vault™ protection system will detect an arc flash by sensing both current and light to positively indicate an arc event. When an arc flash event occurs, the system will send a signal to the arc

containment device. The arc is then diverted to the containment system in less than one-half cycle or eight milliseconds. At the same time the decision to divert the arc is made, the system will also make a decision to open an upstream circuit breaker. This eliminates the fault condition and will turn off the system in approximately three cycles, at which point the fault will terminate.

The GE Arc Vault™ protection system will reduce the energy released by 63 percent or more compared to a bolted fault that would occur with a crowbar system. The energy reduction will lower the stress on other system components such as transformers, circuit breakers, and equipment and improve the overall system uptime when compared to traditional arc resistant switchgear.

If an arc flash incident occurs during normal operation and maintenance, in many cases a contractor will be able to make the Arc Vault™ protection system operational again within a working day since fewer replacement parts are required, improving overall system uptime when compared to traditional arc resistant switchgear.

The GE Arc Vault™ protection system will also reduce building construction costs, compared to traditional arc resistant switchgear, because it does not require exhaust chimneys or plenums to direct the arc flash energy outside of the building.

Retrofit 30-year-old Switchgear

The GE Arc Vault™ protection system will be able to retrofit existing GE switchgear models AKD-6, 8, 10 and 20 containing AKR, WavePro, and EntelliGuard™ series circuit breakers – covering over thirty years of installations – without having to replace existing low-voltage switchgear lineups.

A new piece of equipment containing the Arc Vault device can be located within 50 feet of the existing switchgear and the bus can be connected using cable. The detection system is run within the existing switchgear and connected to the new piece of equipment.

“Depending on site conditions, we estimate the retrofit installation would be completed within a few days,” says Foody.

No Stranger to Arc Flash Protection Breakthroughs

GE has always been ahead of the curve to address the needs of arc flash protection. In 2005, GE launched the Entellisys® Low Voltage Switchgear which has many features that can help workers operate the switchgear from outside the arc flash boundary, such as remote HMI, Reduced Energy Let Thru (RELT) mode, and remote racking units. Entellisys® switchgear also offers advanced protection modes known as zone-based protection, which includes bus differential and multi-source ground fault protection.

In 2008, GE launched the AKD-20 low-voltage switchgear with the industry leading EntelliGuard® G circuit breaker. The switchgear features breaker compartment doors that have no ventilation openings, thus protecting operators from hot ionized gases during circuit interruption. Integral to the EntelliGuard® G line are the new, state-of-the-art EntelliGuard® TU Trip Units, which provide excellent system protection without compromising either selectivity or arc flash protection. With its Reduced Energy Let-through setting (RELT), the system protects at HRC1 or 2 for available fault currents as high as 100kA.

Find out more about Arc Vault™ by visiting www.geelectrical.com/arcvault

GE Consumer & Industrial spans the globe as an industry leader in major appliance, lighting and integrated industrial equipment, systems and services. Providing solutions for commercial, industrial and residential use in more than 100 countries, GE Consumer & Industrial uses innovative technologies and "ecomagination," a GE initiative to aggressively bring to market new technologies that help customers and consumers meet pressing environmental challenges, to deliver comfort, convenience and electrical protection and control. General Electric GE brings imagination to work, selling products under the Monogram®, Profile™ GE®, Hotpoint®, SmartWater™ Reveal®, GE Edison™ and Energy Smart™ consumer brands, and Entellisys® industrial brand. For more information, consumers may visit www.ge.com.

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