



Innovation in motion

How ABB's MV product portfolio is evolving to address market needs

SAMI RAITAKOSKI – The medium-voltage power world is in the midst of a challenging, and yet exciting, time. As the world becomes increasingly more reliant on secure electricity supplies, pressure on the power distribution industry to deliver is also increasing. The ways in which electricity is being generated, transmitted and even used are changing – that is the challenging part. The exciting part comes from the new technologies and solutions being created to meet those challenges. In order to respond to the evolving needs of today's global power distribution market and to help support power and utility companies, ABB is pushing the boundaries of technology, establishing itself as a trusted partner, and expanding its global footprint through new growth opportunities. Continual, proactive advancements allow ABB to offer a wide range of new products and solutions for its customers to enhance grid reliability, meet rising demands for electricity with increased energy efficiency, and improve productivity.

1 Advantages of ABB's medium-voltage offerings

- Breadth of offering
- Depth of technology
- End-user segment diversity
- Global view and presence
- Vast installed base
- Market-leading positions
- Local market focus and footprint
- Ability to leverage scale
- Multiple channels to market
- People and domain competence

2 Market drivers in the medium-voltage segment arena

- Urbanization
- Energy-intensive industries
- Remote bulk generation from renewables
- Distribution generation
- Cost pressures
- Aging infrastructure

3 ABB's innovative plug-and-play modules avoid lengthy shutdowns of rail services for the installation of coupling stations.



ABB has been in the business of medium-voltage power distribution for well over a century, providing utility, industrial and commercial customers with safe, reliable technologies. Over this time the company has been a constant pioneer both of the technology itself and of its applications. The huge portfolio of products and services available now for current conduction, electrical insulation, switching operations, protection, control and interruption is a testament to this pioneering spirit. Today's portfolio includes 66 product lines in 34 sites in 27 countries. And this portfolio is evolving so that ABB can offer its customers solutions that are more efficient and reliable, safer, smarter, more environmentally friendly, and easier to engineer, install and operate → 1.

Change factors

A variety of issues are driving the product and service solutions for maturing medium-voltage markets → 2. More people in cities means more pressure on city

grid modernization, extension, etc. An aging population means there are fewer personnel who are knowledgeable about old and new equipment. There is a growing complexity of installed-base, historically grown assets in different levels of the life cycle, along with different levels of know-how on old, mid-age and new

Renewable energy sources, distributed generation and increasingly complex and demanding networks of power consumers are also factors.

Smart technologies

As part of modernizing their networks, medium-voltage operators are looking for

products equipped with sensors and IEDs. To address the demand for smart switchgear, ABB has developed the UniGear Digital product family for primary substations. It is

An evolving global economy demands that ABB continually seek ways to better serve its customers.

assets. This in turn increases the need for immediate access to documentation and information about all the assets. And these all bring about safety and reliability issues.

Utilities are looking for smarter, more sophisticated solutions to modernize their networks. In addition more environmentally friendly solutions are being asked for.

based on an optimized integration of current and voltage sensors into MV switchgear, combined with the latest IEDs and IEC 61850 communication. Through improved levels of automation and communication in substations central operators can optimize grid operation.

World view

Different regions and countries around the world can have needs specific to

Title picture

The world is becoming increasingly dependent on secure electrical supplies. How is ABB helping its electrical distribution customers meet the challenge?

4 SafeWind, ABB's tailor-made switchgear for wind turbines, is the slimmest medium-voltage switchgear on the market.



that particular area. ABB is addressing its global reach into new markets with products under ABB's "country for country"/"region for region" approaches. A unique offering for the distribution market in India is an example of this.

ABB combined its well-proven and reliable switchgear, circuit breaker, and protection and control technologies to create the ZN1 for the unique needs of the distribution market in India. ZN1 is a primary distribution switchgear with features such as a compact construction, low maintenance design and an internal arc withstand current rating of 26.3 kA for 1 s, which is unique in this sector. The design is the perfect solution for applications in India's construction, automotive, water distribution, textile, rail transportation, pharmaceutical and data center industries. Designed and developed in India, ZN1 offers easy installation and maintenance. The smaller footprint and compact design reduces switchgear room dimensions resulting in additional energy savings due to reduced air conditioning and lighting requirements.

Adapting to industries

Installing coupling stations in a traction power supply system can be a costly, complex and time-consuming process that causes disruptions to passenger and freight services. ABB has been able to take its innovative plug-and-play module system to the rail industry in order to avoid lengthy shutdowns of rail services → 3.

The solution comprises medium-voltage modules that are preassembled and factory-tested to enable speedy erection

5 ABB service engineers develop innovative customer service solutions.



on-site. Available for either indoor or outdoor installation, the modules can be erected and commissioned overnight to avoid disruption to busy daytime rail schedules.

The main components – circuit breaker and disconnecter switches – are made by ABB and have long and proven track records in railway environments. The cir-

The ABB drives channel partner network offers global quality with local availability.

cuit breaker has an innovative design that enables the entire module to be transported simply and efficiently in a standard ISO freight container.

Swiss Federal Railways and South Africa's Gautrain are among the first to embrace this solution.

Switchgear alternative

Environmental concerns are also driving the development of a new generation of power distribution products. In order to meet the increasing demand for solutions with lower environmental impact, ABB developed SafeRing Air, a compact ring main unit that uses dry air as an alternative to the traditional SF₆ insulating gas.

ABB also recognizes that wind and solar sources present a more complex energy flow for distribution equipment to handle and is extending its global footprint by meeting the unique needs of the renewable energy sector.

For example, SafeWind, ABB's tailor-made switchgear for wind turbines, is the slimmest medium-voltage switchgear on the market and small enough to fit through the narrow doorway of the turbine tower → 4. Designed specifically to meet the switchgear requirements of wind turbine manufacturers for compactness, safety and flexibility, SafeWind is a complete range of secondary distribution gas-insulated switchgear for onshore and offshore applications in the global wind power market.

Safety issues

Safety is addressed throughout ABB's entire portfolio. In the face of the internal arc-fault hazard present in medium-voltage switchgear, ABB is continually looking at its portfolio for safety solutions targeting operators and equipment protection in all daily activities. To that end, ABB has developed a highly sophisticated arc-fault risk-mapping software, as well as an ultrafast earthing switch (UFEST™), which is the most powerful arc-fault-quenching system available.

Customer service

An evolving global economy demands that ABB continually seek ways to better serve its customers. Service innovation is a new and significantly improved service concept that ABB is implementing. Service innovation is about shifting the

6 The ABB drives channel partner network takes the sales, support and service business to the customer.



focus away from just providing solutions and instead focusing on the job the customer is trying to get done. ABB strives to better understand and translate customer needs into viable products, solutions and services → 5. One example is a powerful Web-based portal from which the complete portfolio of ABB service offerings are immediately accessible.

Additional partnerships

Building close partnerships with third parties is another way of offering fast, effective and reliable sales support to its customers. To that end ABB has an international drives channel partner network. For instance, ABB's product expertise combined with original equipment managers' (OEMs) detailed knowledge of segments, application sectors, experience and local conditions has been very effective. ABB is creating high-value customer partnerships with OEMs that provide a comprehensive product portfolio, partner programs and cooperation models that embrace MV products and systems → 6. The ABB drives channel partner network offers global quality with local availability. It is a network of authorized partners that takes the sales, support and service business where it belongs – close to the customer.

Working with the customer

ABB understands that close collaboration with the customer during product development leads to well-received products that fulfill the customer's requirements. Collaboration agreements continue to be an important factor in product development. One recent example is the extensive undertaking to develop a

better solution for detecting transient and restriking earth faults. Part of this effort involved the cooperation of selected power utilities in order to test and develop the new earth-fault protection functions. A new algorithm was developed in close cooperation with the Vattenfall utility in Sweden, where it was tested with actual disturbance recordings representing a wide variety of network and fault conditions. ABB's continued collaboration with its customers to develop future products helps to ensure increased power availability.

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