Power Products Services
Retrofit, modernization and service solutions
ABB is a global leader in Power and Automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries.

ABB has been present in India since 1928. Today it has 14 manufacturing facilities in the country. Customers are served through an extensive countrywide presence of around 30 marketing offices, 8 service centres, 3 logistic warehouses and a network of over 775 channel partners.

ABB’s Power Technologies business offers electric, gas and water utilities as well as industrial and commercial customers a wide range of products, systems and services for power generation, transmission and distribution. ABB’s turnkey solution capabilities in the sector range from bulk power transmission, turnkey substations and complete electrification to substation automation and network management systems.

The product offering covers a wide spectrum of technologies across the entire voltage range including indoor and outdoor circuit breakers, air and gas insulated switchgear, instrument transformers, disconnectors, capacitor banks and filters for reactive power compensation, power and distribution transformers and a range of power distribution products like Compact Secondary Substations (CSS) and Ring Main Units (RMU).

**Advantage ABB**

- 120 years of technology and innovation
- Unparalleled domain competence
- Vast global experience
- Total solution provider
- Large installed base
- Environment-friendly technologies

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Overview of services over life-cycle
The oldest substation can become the most modern

1.1 Status checking
Analysis and diagnosis using risk assessment and the latest analysis technology

1.2 Modernization
Modification kits to give older equipment better reliability and longer life-cycle

1.3 Retrofit and up-gradation solutions
Retrofit kits for upgrading equipment to latest standards and requirements

1.5 Testing, installation and commissioning
Testing, installation and commissioning with expertise in right practices and qualified engineers

1.6 Repairs and over-haul
Supervision services for repair and over-haul of equipment

1.7 Spares support
Spare parts are made available for all power products

1.8 Service contracts
The agreement can include both acute measures and planned maintenance carried out with minimum operational interference.

1.9 Training
Standard and customised training modules with hands-on training and interactive classroom sessions. ABB’s training centres are located at Vadodara, Nashik and Bangalore. Customized training programmes are also conducted at sites as per customer requirements.

Advantages of Retrofitting and Modernization
- Life extension with new technologies
- Low investment – 50 to 60% of new installation
- Increased personnel safety
- Increased product reliability – minimized shut downs/ outages
- Speed in execution
- Execution in a phased manner as required, for minimum interruption
- No change of location – foundation not disturbed
- Re-routing of power / control cables not required
- Long term availability of spares
High Voltage Products up to 800 kV – Retrofit and modernization solutions

Switchyard augmentation and bay extension services

- Bay extension for AIS substations
- Bay extension for GIS substations
- Substation upgradation by installation of hybrid switchgear PASS - the factory assembled and tested modular solution is installed in a very short period with minimum interruptions
- Solutions for increasing personnel safety by using modern and new technologies

Circuit Breakers

- Retrofit of oil and air blast circuit breakers of any make with modern SF₆ technology circuit breakers
- Increase current rating by change of current path
- Up-gradation of drive mechanism kits for increased mechanical life
- Circuit breaker mechanism exchange - by using improved link-gear, new on/off locking devices and new operating device
- Full breaker overhaul
  - Replacement of worn-out mechanism components
  - Replacement of main contacts
  - Replacement of interrupter components
  - Incorporation of design enhancements
Synchronized switching of circuit breakers with Switchsynch™

The microprocessor based mechanism enables control of circuit breakers and elimination of harmful transients in case of sudden changes in voltage, current or load due to:
- shunt capacitor banks
- shunt reactors
- no-load transformers
- no-load overhead lines

Disconnectors

Retrofit of existing disconnectors with latest technology disconnectors for:
- Energy efficient solutions
- Maintenance-free operations
- Increased current rating
- Corrosion-free electrical and mechanical joints
- Dead-center locking arrangement
- Additional earth switches
- Remote operation with SCADA
- Remote monitoring through GPS connectivity

Instrument transformers

Carrying out health check-up of existing instrument transformers and recommending corrective actions.

Products and solutions for Reactive Power Compensation

Harmonic Filters

Capacitors
- Replacement of ageing capacitor banks with new banks and supply of spare capacitor units
- Replacement of ageing insulators, busbar connections & structures

Filter reactors
- Replacement of ageing reactors
- Replacement of substation material associated with filters as required
- Upgrade existing ageing 11kV harmonic filter banks with APFC (Automatic Power Factor Control) on case to case basis

Harmonic analysis
- Consultancy for filter design - measurement to analysis and recommendation
- Multiple alternatives for refurbishment, upgradation and retrofit

On-site testing without shut down

On-site capacitance measurement without shut-down for maintenance activities with CB 10 measurement bridge
Medium Voltage Products up to 40.5kV – Retrofit and modernization solutions

Scope of Medium Voltage retrofit

- Retrofit of old circuit breakers with modern SF₆ and vacuum technology
- Conversion of fixed type circuit breaker to draw out type, circuit breaker to contactor, transformer feeder to motor feeder etc.
- Up-gradation of panels with respect to current and voltage rating and fault level
- Revamping of schemes, up-gradation of bus-bars, instrument transformers etc.
- Protection systems up-gradation
- System up-gradation with new technologies for increased personnel safety

Retrofit solutions

One-to-one solution

- The new circuit breaker is re-engineered such that the static portions of switchgear panel, busbars, CT/cable compartment and relay/metering compartment are not changed
- Solutions available for various makes e.g. ASEA (ABB), VOLTAS, NGEF, JYOTI, FUJI, REYROLLE, MEI, ALIND, Kirloskar ASEA, Russian makes etc.

Module solutions

- The circuit breaker compartment is re-engineered such that the old circuit breaker along with the breaker compartment is replaced with the new circuit breaker and breaker housing, designed and tested for the existing switchgear
- Existing partitions, shutters, power contacts, racking mechanism and control circuit plugs and sockets are replaced with new ones as required

Protection system up-gradation

- Retrofit of old relays with numerical communicable relays and SCADA solutions as required
- Replacement of discrete relay systems with latest numerical terminals
- Upgrade functionality with communication system
- Retrofit of arc detection relays for increased safety
Substation augmentation
- Extension / replacement of switchboards
- Bay extension and revamping

Compact Gas Insulated Switchgear for up-gradation of existing switchgear
- Replace Air Insulated Switchgear with compact GIS SafePlus
- Replace obsolete oil-filled RMUs with SF6 RMUs
- Addition of metering panels to meet tariff metering requirements
- Various configurations of compact GIS available including extensible types
- Ring Main Unit automation for growing need to automate network operation and control
  - Upgrade motor kit to enable open and close of switch disconnector
  - Communication capability to support remote monitoring and operation

$I_s$-limiter applications for up-gradation of existing switchgear due to increased fault level
$I_s$-limiter applications enable use of existing switchgear even when system fault levels go-up beyond the rated short-circuit capacity of the installed switchgear. It is the fastest limiting switching device up to 40.5 kV, 5000A and provides
- Limitation of short-circuit currents up to 210kArms tested
- Solves short-circuit problems in new substations and substation extensions
- The peak short-circuit current will never be reached
- The short-circuit current is limited at the very first current rise
- Tried and tested in thousands of installations
Transformer Services

Solutions for every situation

Over 100 years of experience in design, development and manufacturing of power, distribution, traction, industrial and special transformers and associated services has established in ABB a wealth of technology and service solutions.

TrafoSiteRepair™ – Bring the factory to site

The process facilitates transformer repair, refurbishment and retrofit to be carried out completely on-site reducing repair times, as well as high costs and risks of transporting transformers from sites to factories.

Features

- High quality repair in record time
  - Clean environment
  - Lifting capability
  - Efficient drying
  - Strict quality process
- Shell & core types up to 800 kVAC and 600 kVDC
- 200+ units repaired over 15 years with no failures

Condition monitoring of transformers

Condition monitoring helps utilities to manage the ageing fleet of transformers for zero or minimum downtime with optimum redundancy. Other important benefits can be life time extension and upgrading of transformers for risk reduction.

ABB’s TEC (Transformer Electronic Control), detects faults and provides data collection functionality for condition assessment. Application examples are advanced frequency response analysis, dielectric response measurements and calculations of short-circuit strength and overloading capability. Besides using direct measurements, the diagnostic evaluation relies on theoretical considerations drawing on ABB’s in-depth knowledge of transformers and modern design tools.
Transformer preventive maintenance actions - at a glance

Condition enhancement and on-site refurbishment, supply of original spare parts and tap changer rework. We partner you from the planning-phase and our professional management of processes and site activity support in finding the optimal solution.

- Reduce life-cycle costs

Transformer retrofit, repair and up-gradation – at a glance

Performance improvement and increased value of existing equipment due to full technical restoration either with cellulose or NOMEX®, modernization and complete component check either on site or in the workshop. Working on site, ABB uses special processes and tools ensuring highest quality and short lead-time.

- Extend asset life time
A service agreement always guarantees that the resources you need are available in the form of well-trained erectors with practical experience, substation experts with a wide range of skills and product specialists with an in-depth knowledge about various equipments.

The agreement can include both acute measures and planned maintenance, which is carried out with minimum operational interference.
Training

We offer customised training modules with exhaustive hands-on training and interactive classroom sessions that provide in-depth information on wide range of products, systems and solutions for power transmission and distribution, including the latest technological developments.

The scope of training modules includes:

- Operation and maintenance
- Condition-monitoring
- Erection and commissioning
- Protection and distribution automation
- System engineering
- Settings and general protection schemes

ABB’s state-of-the-art training centres are located at:

- Vadodara – for comprehensive and a wide range of power technology products and systems
- Nashik – for medium voltage switchgear products and technologies
- Bangalore – for products and solutions for reactive power compensation

Training programmes at customer sites

Our experts also conduct customised training programmes at your premises.
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