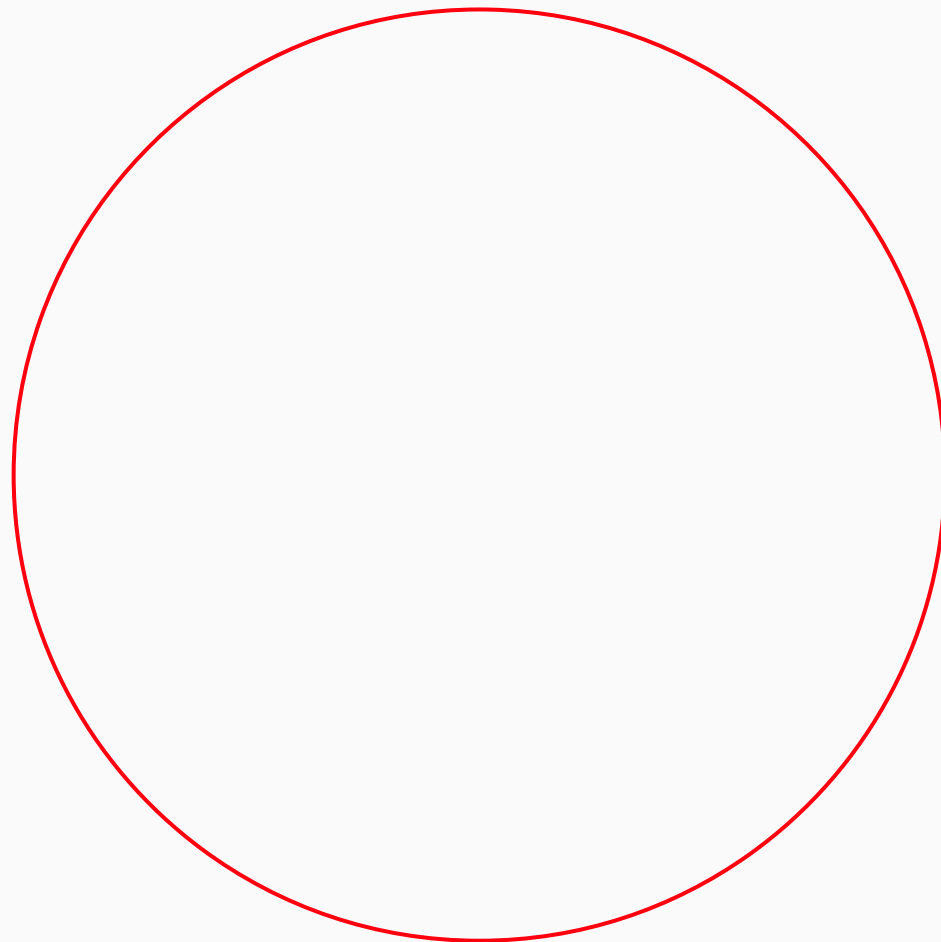




Service Portfolio for Excitation Systems

Keeping customers
for life



ABB's Product Life Cycle Management model

The foundation of ABB Care for Excitation

ABB UNITROL® and MEGATROL® systems offer seamless integration with any type or brand of motor, generator or synchronous condenser at your facility.

ABB's unwavering commitment lies in the reliability of your operations. We go to great lengths to optimize your production uptime, ultimately reducing your system's life cycle costs. Under ABB's Care program and through our Product Life Cycle Management model, we offer you technical solutions and support required to ensure the steadfast reliability of your excitation systems, including **UNITROL**, **MEGATROL** and **Synchrotact** products.

ABB's Product Life Cycle Management model

Owning an ABB excitation or synchronization system ensures you benefit from a robust product life cycle management, spanning from installation to evolution and replacement. ABB guarantees comprehensive support across all product phases (Active, Classic, Limited, Obsolete), encompassing complete life cycle support for the active and classic phases, as well as offering upgrade and migration options for the limited and obsolete phases. This ensures your equipment operates at its highest efficiency and productivity throughout its entire life cycle.

Key benefits

- Reliable and safe operations
- Minimum unexpected downtime
- Lower cost of ownership
- Efficient maintenance programs
- Extended life cycle of your assets

Access to the life cycle notification of your System:



ABB's Product Life Cycle Management model:

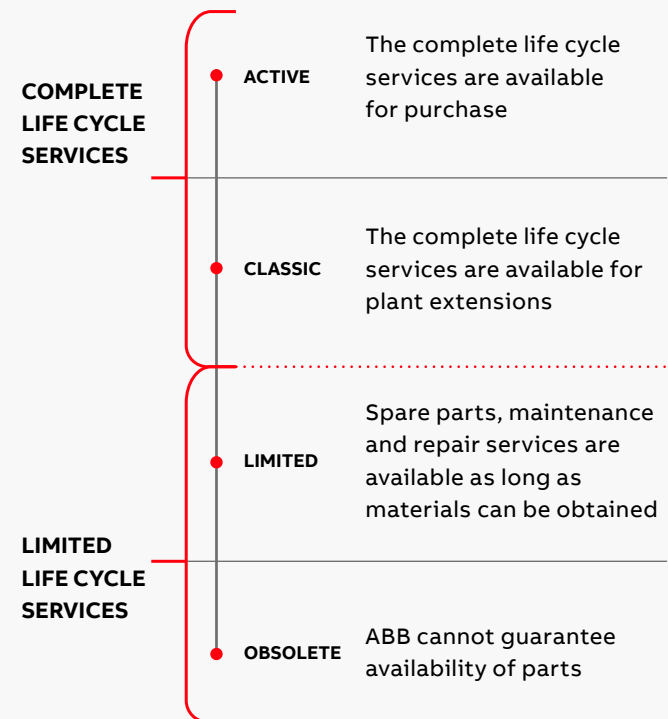


ABB Care for Excitation

Keeping customers for life

ABB Care for Excitation is a service agreement that offers optional packages tailored for all users in energy industries. Based on [ABB's Product Life Cycle Management model](#), ABB Care for Excitation provides structured support, simplifies service delivery to control costs, offers **operational improvement**, all while extending **system life cycle** and enhancing functionality for your excitation systems.

ABB Care for Excitation allows you to select services that are critical for the **performance and reliability** of your excitation system, while taking into account your budget, **maintenance and sustainability** needs. Benefit from preferential loyalty offers, and discounts on services, by selecting from one of three available programs (Rapid Response, Life Cycle Management, Performance Improvement).

Key benefits

- 1. Efficient planning and resource management:**
 - Streamlining planning for better resource allocation
 - Predictable annual maintenance budgets for financial planning
- 2. Responsive support services:**
 - Prioritized remote support responsiveness and on-site dispatch
 - Effective phone support for swift issue resolution
- 3. Spare Parts Management:**
 - Detailed Spare Parts Fingerprint report provides insights for proactive maintenance
 - Prioritized spare parts dispatching
- 4. Life cycle planning:**
 - Asset lifetime planning for longevity and sustainability
 - Budgeting for future upgrades
- 5. Improved performance:**
 - Built-in health checks for optimal performance
 - Continuous optimization and update of your assets
- 6. Cost savings:**
 - Exclusive discounts and loyalty offers
- 7. Transparent Terms & Conditions:**
 - Clear terms for transparent transactions with focus on system performance



Video

ABB-certified upgrades and evolutions

Extend the life and security of your Excitation Systems with the latest ABB control technology

ABB-certified control upgrades

Excitation systems play a critical role in the energy world, but the pace of the control platforms updates strongly constrains their life cycle. A control upgrade will bring your system to the newest control technology, with zero impact on footprint in a time- and cost-effective manner.

Key benefits

- Long-term availability of control parts and services
- Safety and security to operating people and communities
- Sustainable reuse of converter, field breaker, terminals, and busbars
- Full ABB warranty for control parts
- Possibility to integrate additional features

ABB-certified Excitation Control Terminal (ECT) upgrade

ABB's ECT is a user-friendly human-machine interface (HMI) that runs independently of the controller and is used for monitoring and controlling the excitation system. Our ECT upgrade kit is available either as a retrofit or an upgrade. Opting for the ECT upgrade via an ABB Care for Excitation agreement includes monthly security bulletins containing ABB-tested patches for your ECT.

ABB-certified Software upgrades

ABB's commitment to excellence includes ongoing software development. This ensures reliability, data integrity, compliance with grid regulations, and optimized performance for excitation and synchronization equipment. ABB's software upgrades for active products ensure that maintenance and commissioning tools function on the most current Windows operating system.

Key benefits

- Avoid obsolescence risks on legacy Microsoft Windows operating systems
- Meet cyber and regulatory security requirements for Windows-based systems
- Reduce system vulnerability with access to ABB-tested patches
- Update of system firmware to include the latest product enhancements



Video

SOFTWARE
UPGRADES

ABB-certified upgrades
and evolutions

ECT
UPGRADES

CONTROL UPGRADES

Performance Review

Protect your asset by investing in reliability

The ABB Performance Review program's primary objective is to ensure the safe and reliable performance of your systems. We attain this by conducting thorough assessments of system performance under various operating conditions, rigorous testing of essential supervision functions, and the integration of operation-critical software updates. Following this process, we compile a detailed report based on our ABB-certified Expert's observations and offer recommendations to minimize unforeseen downtime.

Performance Review

The performance review program is offered during all phases of the Excitation System product life cycle. Keeping the failure rate of components at a minimum will reduce the risk of unexpected downtime, thereby increasing your revenues. We have the ability to define an optimal operation strategy based on the result of the Performance Review and by considering the status of the life cycle of your assets.

Key benefits

- Ensure the proper and safe operation of your system
- Minimize unexpected downtime
- Identify possible system improvements
- Increase reliability of your operation

Video



Training

The latest knowledge. Anytime, anywhere.

ABB University & Online Excitation Academy offers a wide yearly program of online, in person, or hybrid classes for Operation & Maintenance crews to increase your return on investment, reduce time and to achieve a maximum performance. To support continuous learning, ABB offers a comprehensive set of training paths to provide engineers, programmers, maintenance and operations personnel with up-to-date technical expertise for existing and new products, processes, and technology advances.

Tailored training

We provide customers with the flexibility to schedule personalized training sessions tailored to their unique requirements and schedules. Our experts will customize the training to address your team's specific needs. You can choose to have the training at our ABB learning center, at your location, virtually, or in a hybrid format. Additionally, we offer complimentary access to simulators for one week after the training, enabling self-guided learning.

Standard training

Our standard courses are available in both in-person and virtual formats with set schedules. In both options, trainees gain theoretical knowledge and immediately apply it using our equipment or remote-access simulators. An ideal opportunity to arrange training for a small group or your latest team member, accelerating their knowledge to effectively operate, maintain, and troubleshoot equipment when needed.

Remote simulator

Sustain the knowledge gained from training through our remote simulators, available anytime, anywhere. Provide your team easy access to perform complex equipment operation simulations on ABB equipment, eliminating the need for travel. These simulators facilitate a self-paced learning environment and offer valuable troubleshooting experiences.

Key benefits

- Improved expertise knowledge to achieve maximum performance
- Customized content to meet your specific training needs
- Learning new skills will become an asset to your organization



STANDARD
TRAINING

TAILORED
TRAINING

Training

REMOTE
SIMULATOR

Spare Parts Management & Parts Fingerprint

Ensure the proper and safe operation of all your excitation systems

Original spare parts and components with guaranteed functionality – the key element of reducing the mean time to repair (MTTR). Spare parts availability can significantly reduce the downtime associated with excitation maintenance, forced outages, as well as electrical and mechanical failures. As a minimum for operational reliability, it is essential to have critical spare parts and components readily available.

Spare Parts Management

Our service provides you with a recommended list of spare parts, keeps you informed about critical ageing processes of vital components, and takes care of testing, maintaining, and adjusting your stock.

Parts Fingerprint

ABB's Parts Fingerprint service prevents operational downtime stemming from the absence or obsolescence of essential spare parts. It offers tailored recommendations that identify deficiencies, bolster reliability, and enhance the cost-efficiency of procurement for essential components.

Key benefits

- ABB original spare parts
- Identifies inventory gaps
- Highlights the life cycle and assessment of the risks
- Enables customers to make the optimal purchasing decisions
- Optimizes inventory and identifies potential savings
- Enables your plant to be proactive
- Helps to avoid unnecessary production downtime costs
- Increases operational reliability



SPARE PARTS
MANAGEMENT

PARTS
FINGERPRINT

**Spare Parts Management
& Parts Fingerprint**

Field services and on-site support

World-class service for a quick, reliable response

ABB field services encompass a diverse range of site activities, from the installation and maintenance to troubleshooting and optimization of your excitation systems. Our highly experienced and certified field service engineers, linking directly to our Centers of Excellence, combine swift response, competence, and professionalism to guarantee professional startup, equipment adjustments, and maximum value in commissioning and troubleshooting. This integration of expertise and on-site support drives innovation and operational excellence.

Commissioning

Commissioning involves the meticulous testing, verification, and optimization of your excitation systems to ensure they meet design specifications and operate efficiently. Our skilled experts will identify and rectify issues on the spot and ensure the safety, reliability, and optimal performance of your systems.

Specialized testing

ABB offers support for specialized testing on synchronous machines for validation and compliance. Field assessments ensure safe and efficient operation, compliance with regulations, and enhanced performance, contributing to reliable power generation.

Troubleshooting

Customer issues are promptly addressed as a top priority, swiftly investigated, and resolved. Our field support team stands ready to provide a comprehensive range of services to meet your technical requirements.

Key benefits

- Access to an extensive global network of over 100 ABB-certified specialists
- Access to ABB-certified field experts
- Advanced diagnostic and repair practices



Connected services

Rapid customer care, from everywhere

ABB offers professional customer support for all UNITROL® / MEGATROL® systems. Connected Services offer real-time support, thus enhancing customer interactions with ABB-certified Service Experts. Benefits include improved assistance, reduced travel-associated costs thereby optimizing operations and minimizing environmental impact.

24/7/365 Emergency supportline

Our emergency supportline operates 24/7/365 days a year and ensures immediate assistance during crises. Benefit from rapid response, expert guidance, and timely interventions.

Augmented support

Our augmented support connects experts virtually to offer troubleshooting and maintenance assistance. Our ABB-certified Service Experts can remotely support your site personnel through specialized connectivity options designed for our Connected Services solutions.

Remote Access support

Our remote access support provides a secure platform for ABB-certified Service Experts to perform full performance reviews, commissioning and troubleshooting.

Remote Access Support (RAS) utilizes a secure platform to facilitate remote support for critical infrastructure, including Excitation Systems. It ensures troubleshooting, commissioning, and performance reviews can be performed even at power plants with limited on-site accessibility.

Key benefits

- Fast and effective connection to site
- Reduced downtime
- Faster Return on Investment (ROI)
- ABB-certified Service Expertise
- Reduced travel-associated cost and time, as well as environmental impact



AUGMENTED
SUPPORT

EMERGENCY
SUPPORT 24/7/365

Connected services

REMOTE ACCESS
SUPPORT

Cyber security

Protecting Energy Industries
essential services and infrastructure

Cyber security for Energy Industries

The energy sector heavily relies on interconnected digital systems and smart technologies to manage power grids, monitor operations, optimize the generation and facilitate distribution. This technological integration exposes the industry to potential cyber threats and vulnerabilities, ranging from malicious attacks to data breaches and pose substantial risks to public safety and national security.

Protecting these systems is paramount, necessitating robust cyber security measures to safeguard against potential intrusions and ensure the continuous, secure functioning of energy networks and services.

Cyber security bulletins

ABB's cyber security bulletins allow the customer to be up-to-date when it comes to actions to take on the UNITROL Human Machine Interface (HMI) in order to keep it cybersecured and mitigate cyber vulnerabilities.

Key benefits

- **Patch vulnerabilities:** regular updates for the UNITROL HMI Operating System (OS) address known security vulnerabilities, fixing loopholes and weaknesses that cyber attackers may exploit to gain unauthorized access or launch malicious attacks
- **Enhanced security features:** updates introduce new security features and improvements, reinforcing the system's defenses against evolving cyber threats, such as malware, ransomware, and phishing attempts
- **Protection against exploits:** keeping the HMI OS up to date helps prevent exploitation of software vulnerabilities by ensuring that security patches are applied promptly, reducing the risk of system compromise or data breaches
- **Maintaining compliance:** updated systems align with industry standards and compliance regulations, enabling businesses to meet security requirements and avoid penalties or legal issues arising from security breaches
- **Support and technical assistance:** updated UNITROL HMI OS receive ongoing support and technical assistance, including access to customer support and assistance for resolving security-related issues, ensuring a more secure computing environment



Grid Code Compliance packages

Providing simulations and validations required by the grid codes

While the energy demand continues to grow, and the transmission and distribution network becomes more unstable because of distributed renewable generation, operators and regulators need to ensure resilience and reliability of the grid. For this reason, they have defined the minimal technical requirements and processes to connect to it. They are known as Grid Codes.

Grid codes vary in each country, are highly complex, ABB serves as a single point of contact for the entire spectrum of services, encompassing everything from installation to compliance. Compliance is not trivial: many steps must be taken before obtaining a Final Operational Notification (FON), the green light to connect to the network.

Grid code compliance studies

State-of-the-art simulation studies based on detailed plant models to effortlessly achieve an Interim Operational Notification (ION).

Modeling validation services

Development of custom models in multiple simulation platforms and validations towards site measurements to achieve Final Operational Notification (FON).

Compliance testing & supervision

Performing required tests to verify compliance of voltage control, Power System Stabilizers (PSS) and reactive power capability as well as supervision of compliance tests throughout the complete certification process.

Key benefits

- Enhanced reliability and compliance to country-specific standards
- Optimized equipment performance by ABB-certified specialists
- Seamless integration utilizing equipment technology and grid compliance know-how
- Regulatory grid compliance confidence
- Optimized costs of studies and compliance



GRID CODE
COMPLIANCE
STUDIES

**Grid Code
Compliance packages**

MODEL
VALIDATION
SERVICES

COMPLIANCE TESTING
& SUPERVISION

Digital Twin

Ensuring accurate and reliable studies

Simulations

Considering the dynamic and evolving nature of the grid, development of models and the creation of comprehensive digital twins are increasingly vital components in advancing our mission for energy transition.

Efficient provision of dynamic simulation models is crucial for accurate grid modeling. These models, covering synchronous machines, transformers, voltage regulators, frequency controllers, wind turbines, PV inverters, etc., are vital for network operators' integration into larger grid models. Accuracy in simulation models is paramount for Transmission System Operators (TSOs) and Distribution System Operators (DSOs) to analyze critical conditions and plan developments.

Validation against on-site measurements under diverse operating conditions is imperative to ensure accurate representation of physical equipment behavior. Additionally, the format of dynamic models must align with the simulation software requirements of TSOs or DSOs.

Ready-made, certified models

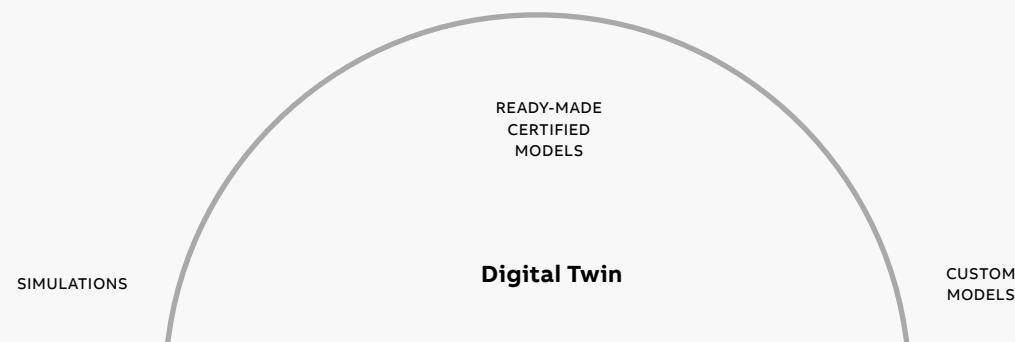
Unlock new levels of improving the efficiency and safety of your assets while reducing environmental impact and enhancing decision-making by utilizing ABB-certified excitation simulation models:

- UNITROL 1000, P, F, 5000 and 6000 simulation models for grid code compliance assessments
- MEGATROL model for simulating startup and braking sequences of gas turbines and synchronous condensers
- UNIREC H₂ model to perform harmonic, short circuit, load flow and EMT studies

Development of custom models

ABB also offers custom, user-defined simulation models for a variety of applications:

- Custom-modeling for hydrogen applications (electrolyzers, AC/DC converters)
- Custom-modeling for plant controls (On-Load Tap Changers, voltage regulators, wind turbines, PV inverters, frequency and power plant controllers)
- Custom-modeling for synchronous condensers (static frequency converters, pony motors, multi-masses models of the shaft system)





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