providing services and support throughout the lifecycle of our products. operational costs and increase productivity with the aim of maximising profit. At Ingeteam, we offer our commitment to maintenance, thus optimising the installation's active time. The main objective of our services and maintenance is to reduce as well remote monitoring and tele-diagnostics technology reduce stoppage times induced by preventive and corrective focus on service. Our dedicated 24/7 telephone technical support, 365 days a year and on-site technical support in 48 hours in over 70 years, Ingeteam has built up a solid portfolio of multi-sector know-how based on our capacity for innovation and our consultancy services. Given the importance of processes in which protection and control packages are installed, especially with system integration projects, consultancy becomes significant in terms of sizing and selecting all of the components reliability and safety. Consulting includes: calculating design efficiency, electromagnetic compatibility, optimal calculations, optimised calculations, grid codes, standards, and harmonised calculations. Furthermore, our employees are constantly looking for new challenges and encourage to participate in designing the resulting solution. Joint participation is part of our company's philosophy with personalised service forming the basis of our relationship with our clients. This collaboration extends beyond supplying our equipment, covering additional services that complement the scope of supply of each individual project.

ENGINEERING.

Electrical engineering includes basic and detailed design as well as choosing key components such as cabling, connection switchgear, etc. Furthermore, the high adaptability of the protection and automation systems and their built-in logic make it possible to configure and program software functions in accordance with project specifications.

MULTI-CONTINENTAL MANUFACTURING.

Ingeteam has production factories in Europe and Brazil, enabling us to optimise manufacturing costs and streamline our after-sales service. COMMISSIONING.

Commissioning includes starting up delivered systems, checking that both the equipment and its functional features are working optimally, and making sure that they meet the requirements defined in the project. TRAINING.

During training, besides familiarising the user with how the equipment works, the maintenance staff will be able to increase their knowledge of installation automation systems and power electronics so that they are able to perform preventive and corrective maintenance unaided during the useful life of the installation.

SERVICE & MAINTENANCE.

In over 70 years, Ingeteam has built up a solid portfolio of multi-sector know-how based on our capacity for innovation and our focus on service. Our dedicated 24/7 telephone technical support, 365 days a year and on-site technical support in 48 hours as well remote monitoring and tele-diagnostic technology reduce stoppage times induced by preventive and corrective maintenance, thus optimising the installer’s active time. The main objective of our services and maintenance is to reduce operational costs and increase productivity with the aim of maximising profit. At Ingeteam, we offer our commitment to providing services and support throughout the lifecycle of our products.
Power Grid Automation

Substation Automation

Ingeteam offers a broad range of products, solutions and software for substation automation fulfilling the diverse needs of the industry. With over 20 years of experience and more than 6,000 substation automation systems in service, Ingeteam’s solution provides a high level of availability, embedded control and easy scalability to meet any installation and substation automation needs. Ingeteam’s range includes key Control & Busbar Protection, Protection Relay, Substation RTU & Gateway, Substation HMIs and their corresponding software tools.

- **INGEPAC-CD**: The INGEPAC™ EF CD (ESS), transmission and distribution line protection and control. INGEPAC™ EF CD is designed to create high-performance protection and control for protection systems, allowing for the complete automation of protection and control for various elements of power systems, including transmission lines and distribution networks. INGEPAC™ EF CD meets the requirements for users who want to integrate protection and full bay HMI/Mimic display, programmable push buttons and bay control numerical technology:
  - Alarm definition (including priority level), management, display and acknowledgement.

- **INGEPAC-RIO**: INGEPAC™ RIO is a Bay Control Unit/uniCapacitor Bank Protection and Control. It is a modular solution designed to be integrated into any substation automation system, providing comprehensive protection and control functionalities for various elements of the power system, including transmission lines and distribution networks.
  - Implements substation control logic with IEC61131-3 compliant programming.
  - Receives commands and set points from control rooms, SCADA systems, or other substation automation devices.
  - Supports time-of-use (TOU) management, self-consumption (partial generation), and other functionalities.

Substation RTU & Gateway

INGEPAC™ EF CD and Gateway functional features, allowing the implementation of redundant control logic as well as communication with upper SCADA levels. The INGEPAC™ EF CD is designed to be integrated into any substation automation system, providing comprehensive protection and control functionalities for various elements of the power system, including transmission lines and distribution networks.

**Software Features**
- Gateway: IT processes the complete set of data collected by INGEPAC™ EF CD, a high-performance modular system designed for substation automation. It provides a high level of reliability and availability by connecting to the reliability-enhanced redundant power supplies, FRM-M controllers, risk boundary models, etc.
- **Substation Automation Solution INGESAS™ IC3**
  - Gateway with 7” Touchscreen HMI.
  - INGESAS™ IC3 is a modular solution designed to be integrated into any substation automation system, providing comprehensive protection and control functionalities for various elements of the power system, including transmission lines and distribution networks.

- **INGEPAC™ EF TD**: This module is designed to be integrated into any substation automation system, providing comprehensive protection and control functionalities for various elements of the power system, including transmission lines and distribution networks.
  - Time of use (TOU) management, Self-consumption (partial or full) for enhancing reliability for emergency back-up, T&D lines congestion relief, Smart shifting, power factor compensation, blind power control, power flow control, etc.

- **INGEPAC™ EF CD**: This module is designed to be integrated into any substation automation system, providing comprehensive protection and control functionalities for various elements of the power system, including transmission lines and distribution networks.
  - Time of use (TOU) management, Self-consumption (partial or full) for enhancing reliability for emergency back-up, T&D lines congestion relief, Smart shifting, power factor compensation, blind power control, power flow control, etc.