Automation Solutions Designed for Power
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About Emerson

Our business focus

Emerson has been in business since 1890 and is a global leader in bringing technology and engineering together to create innovative solutions for customers through its network power, process management, industrial automation, climate technologies, and appliance and tools businesses.

Drawing on a disciplined management process, deep customer relationships and vast experience in a wide range of industries and markets, Emerson is able to see tomorrow’s global business challenges.

Our approach to innovation

Solving our customers’ problems is our passion. As a technology leader, we recognise that the key to customer satisfaction and our long-term success is to anticipate customer needs and develop new technologies and innovative solutions that provide our customers with a distinct competitive advantage.

In many cases, our new technologies and expertise result in first-of-their-kind solutions. When Emerson takes up the challenge; It’s Never Been Done Before simply becomes Consider It Solved.

Sustainable results

With 240 manufacturing locations worldwide and sales offices in more than 150 countries, our products and services are marketed throughout the world. We have over 127,000 employees and sales of $21 billion in the 2010 financial year.
About Emerson Process Management

The power to predict results

Our aim is to help process industries better manage their plants through intelligent control systems and software, measurement instruments, valves and industry solutions. In industries where a single day of downtime can mean millions of Euros in lost production and even more in lost reputation, our customers must be able to predict problems before they happen.

To stay competitive, they must operate as efficiently as possible, reducing downtime and improving results. Emerson systems, solutions and process instrumentation deliver precision control and asset management that optimise plant capabilities and provide predictability in industries ranging from power to petrochemicals to pharmaceutical.

Smart Wireless extends the benefits

Emerson’s Smart Wireless extends PlantWeb predictive intelligence still further into areas that were previously out of physical or economic reach. Technological and cost barriers for monitoring water pumping in remote stations, temperatures on the pre-combustion chamber or on cooling towers, for example, do not exist any more.

Superior technologies

We have the most comprehensive array of superior technologies including the Ovation™ digital automation system, Rosemount® and Micro Motion® intelligent field devices, Fisher® valves and AMS Suite software, all connected through our PlantWeb™ digital plant architecture. The PlantWeb network of predictive intelligence enables you to detect process and equipment problems even before they occur.

Expand to electrical smart devices

PlantWeb – through the Ovation system – also integrates electrical equipment and increases the advantage of smart devices with efficient operation and extended diagnostics.
A dedicated division for the power industry

A brief history

The history of the Power & Water Solutions division can be traced back to Westinghouse Electric Company, a widely respected engineering company. As Westinghouse Process Control, we helped to revolutionise the process control industry.

Not only were we the first company to apply digital computers for gas turbine control, steam turbine control and utility boiler control, but we were also the first to create an entirely distributed computing system for data acquisition and control functions utilising a common hardware and software platform.

In early 1997, we again redefined process control with the Ovation system, a powerful, evolutionary technology that utilised open standards and commercial off-the-shelf (COTS) components. Emerson Electric then recognised the potential of Westinghouse Process Control and acquired the company as a critical element of Emerson Process Management.

Supporting 725 GW of the world’s capacity

Today, our world-class automation solutions provided by the Power & Water Solutions division of Emerson Process Management support 725 GW of the world’s capacity. Using the world’s most advanced technology, we help customers to control critical power generation processes, increase plant efficiencies and megawatt production, and realise their long term operation & maintenance savings.

We understand the changing dynamics of the industry and are able to apply our wide portfolio of solutions to help you achieve your business objectives. These include the capability to implement total I&C solutions – for a single unit, or your entire generating fleet.

Nuclear capabilities

In the nuclear industry, under a 10-year extension of an existing agreement with Westinghouse Electric, we also provide key technology for the automation of nuclear power plants that utilise the Westinghouse AP1000™ design.

We lead Emerson’s business in the power generation sector by delivering the widest array of advanced instrumentation, control, and automation technologies available from any supplier.
Serving the unique needs of Europe

Expansion in the 21st Century

Our performance and expertise have helped us to become a trusted business partner of some of the largest power producers in Europe, such as EDF, GDF SUEZ, ENEL, E.ON, Iberdrola, RWE, Vattenfall, CEZ, PGE, Mosenergo, OGK 2, OGK 5, Fortum, RusHydro and UkrHydroEnergo.

We focus on building committed, long-term relationships. The success of our customers is our prime motivating factor. We strive to help customers to expand through Europe, including Russia, and meet their long-term objectives in a constantly changing business environment.

Global presence

Our expanding global presence now includes offices in many European countries, all of which are supported by full-service centres of excellence for the power & water industries in Warsaw (Poland), St. Petersburg (Russia) and Prague (Czech Republic).

All our European offices have the resources to engineer and support automation solutions. This allows us to provide customised services that address the unique needs of our customers whilst understanding the many regulations and requirements of power generation.

With an experienced staff of highly skilled engineers, we offer comprehensive support services including key account management, project management, design, procurement, engineering, training, field installations service and maintenance contracts.

We provide main automation contractor (MAC) services, where we act as the prime contractor for all suppliers, ensuring a unified, consistent team working towards a successful project.
Emerson provides flexible, reliable automation systems for plants across Europe. We specialise in control and fleet management, including remote monitoring, despatching and resource management capabilities.

Fossil – Hydroelectric – Renewable
Power plant retrofits

Listening to our customers

For existing plants, Emerson’s retrofit strategies are custom-developed for each individual project, with a kick-off meeting to ensure that customer expectations, such as intended outage time frame and level of customer involvement, are fully understood.

No one knows a power plant like the plant staff and we take time to listen to our customers to learn what they already know about their operations.

Emerson replaces the existing vintage control technology, such as controllers, cabling, I/O, workstations and various subsystems, with the latest Emerson hardware and software.

Turbine control modernisation

Our experts in steam, gas and hydroelectric turbines, engineer control solutions for turbines from all major manufacturers, including General Electric, Westinghouse, Siemens, Alstom, LMZ and Skoda. They have experience in designing a complete, integrated solution to replace vintage turbine governor controllers and mechanical components of the hydraulic system.

Whatever our customers decide to include – electro-hydraulic converters, electric linear actuators or high pressure individual actuators, the selected solution is always tailored to the turbine design.

Our solution applies the same state-of-the-art controller utilised throughout the plant and includes automatic turbine start-up and sequencing, as well as speed and load control. We also improve safety by installing our overspeed protection system.

E.ON Karlshamn oil-fired Power Plant

An Ovation retrofit extends the life of the largest oil-fired plant in Scandinavia.

- PlantWeb digital plant architecture.
- Ovation system for monitoring and automatic sequence control for the boiler, main turbine and feed pump turbine.
- Comprehensive upgrade for sootblower controls, burner management system, hydraulic equipment, vibration monitoring system, turbine governor and protection system.
Dynamic optimisation improves unit flexibility

There are many challenges facing the power generation industry. These include complying with environmental regulations, optimising performance and unit flexibility, minimising project risk, scheduling overruns, and maximising reliability.

We recognise the need to develop tools that will help utilities achieve these challenges.

For example, Emerson’s SmartProcess® combustion optimisation increases boiler efficiency while maintaining emissions, decreasing loss on ignition and reducing a number of other plant operating costs. Other tools model plant equipment and overall heat balance, adapting to the plant’s changing conditions and determining the most efficient operating modes.

From base load to on-demand mode

The increasing use of intermittent renewable sources of energy in European production has a global impact on grid stability. Automation system design is crucial for improving primary and secondary controls and therefore to enable power utilities to satisfy the manoeuvrability demand.

Analysing your operation

Our Premier Services experts can carry out on-site study and performance evaluation, through personnel interviews, data review and other pertinent methods to provide analysis of the operations, at their existing generating unit or fleet.

Significant operational efficiency gains for modernised major coal/biomass power plant in Poland.

- SmartProcess® Combustion Optimizer and Steam Temperature Optimizer installed with new Ovation systems.
- NOx emissions reduced by 10-17% when combined with heat improvements of 0.5% - 1.2%.
- Full return on SmartProcess investment within two years.

Benchmarking is made using “Best Practices” in the industry and recommendations are proposed.
New generation plants

Benefits of working with Emerson

Emerson offers the broadest range of plant automation with a full range of intelligent field instrumentation specifically designed for power applications. The unique PlantWeb digital plant architecture integrates such field automation and uses the power of predictive intelligence to improve plant performance. While PlantWeb lowers capital and engineering costs compared to traditional architecture, it provides even greater benefits during operation.

Whether a new generation power plant is Combined Cycle Gas Turbine (CCGT) or a supercritical unit, an Ovation system combined with digital I/O bus protocols offers a tremendous economic impact in engineering, construction, and start-up. When needed, the Ovation system can seamlessly link to third party control systems provided by turbine OEM’s, like GE or Siemens, so that all equipment, can be managed from a single Ovation workstation.

The Ovation system supports direct interface to the General Electric Mark V, VI or Vle Turbine Control system and allows easy and reliable data exchange between the two systems.

We can control boilers, turbines, scrubbers, burner management systems and all the other plant equipment with Ovation to create a unified architecture.

With new generation plants, utilities can realise substantial cost and time savings by involving Emerson early in the design process. We partner closely with all parties involved in the construction and successful completion of the project.

EDF Blénod-lès-Pont-à-Mousson CCGT Plant

New CCGT units for EDF satisfy future energy supply needs and meet climate commitments.

- Comprehensive PlantWeb solution will include monitoring and control of the heat recovery steam generator and balance-of-plant processes.
- Ovation system will also integrate the turbine control system and perform data acquisition.
For many power utilities, the balancing of production between supply and demand during periods of high consumption is critical. For those operating fossil power units, an additional challenge occurs when fossil production can only run for a limited number of days each year. By focusing on regulating the speed and power of the turbine, pumps and boiler, the performance of fossil units can be greatly improved. The Ovation system also provides improved diagnostic information to further improve the crucial performance.

For supercritical units, the accuracy and resolution of the automation system is even more important than in subcritical units. In these cases, use of the very latest automation systems is crucial to maximise the availability and efficiency of these units whilst maintaining high environmental standards.

Emerson employs technologies to increase efficiencies and reduce emissions from fossil plants. We provide flexible, reliable and cost effective automation solutions to control drum, once-through supercritical, ultra-supercritical, and fluidised bed boilers from every manufacturer.

Our experience in Europe with power plant retrofits, as well as new units, remains unmatched, including several references in supercritical applications. Whether your requirement relates to supercritical, CCGT, cogeneration or IGCC, the proven solutions offered by Emerson show that automation is more than just control.

GDF SUEZ Kraftwerk Wilhelmshaven & Co. KG

New 800 MW power plant in Germany

- Ovation system will control the boiler, including safety functions: boiler protection, burner management system, water, air and fuel, as well as controlling turbine and generator auxiliaries.
- The project will follow VGB guidelines and make intensive use of automatic documentation tools.
Automation solutions for hydropower

A complete solution for hydroelectric power plants, operation centres and water management

For over 40 years Emerson has provided unparalleled levels of control for a variety of energy generating assets. Over the last two decades, Emerson Process Management has applied this expertise to renewable energy, including providing automation solutions specifically for hydroelectric power generation.

Emerson’s Ovation system with SCADA technology provides supervisory management of hydro plant and cascade, enabling efficient operation of a complete water system. The Ovation system provides a unified platform that monitors and controls both mechanical and electrical parts.

The Ovation multi-network infrastructure and water optimisation solutions allow complex cascade management.

Through embedded applications for turbine control, pond control, energy management and equipment protection, the Ovation system ensures fewer shutdowns, faster start-ups, and efficient load dispatch. The Ovation system provides a unified platform that integrates data, regardless of the method of transmission, for both mechanical and electrical operation, to centralise your operations for each turbine generator, ICCP and electrical substation.

RusHydro Volzhskaya GES Hydroelectric Plant

Ovation control technology used for the largest hydro power plant in Europe.

- Ovation merged the hydroelectric generation processes into a single unified system for efficient plant monitoring and control.
- System designed by Emerson to use two independent operational steps with high and low pressure oil which helped Volzhskaya Unit 8 reach UCTE requirements without causing degradation of mechanical equipment.
A unified platform for protection and control of hydroelectric power plants

The Ovation system communicates to a full range of protocols to centralise operations for each hydro turbine generator, grid operator interface and electrical substation. To achieve this, Ovation is equipped with native modules that support various protocols, including Modbus, IEC 61850 and IEC 60870 etc. Hydro plant operators have access to a clear, concise view of key turbine parameters. Start/stop sequences include built-in automatic megawatt loading and unloading functions.

Turbine governor and hydraulic system retrofit

Emerson’s Hydro Expertise Centres have the capability to design hydraulic systems in order to replace the original mechanical solutions and increase valve positioning precision. The oil pressure system is redesigned and replaced by a high pressure unit. Valves and servomotors are also replaced to allow better static and dynamic characteristics.

Turbine protection

Ovation controllers and/or Ovation SIS logic solvers (SIL3 certified) manage system faults and process limits – either directly or through the CSI 6500 monitoring system – and achieve protection of the turbine by using a 2oo3 (2 out-of-3) voting trip block.

Water management

Emerson’s solution is designed to optimise and schedule hydro power plant generation within a complex scheme. The system balances synchronisation between grid requirements and other power demands. The Ovation system enables utility-wide time synchronisation.

Modernisation of 100 Hydroelectric Turbine Generators in Ukraine

- Ovation systems will manage and control 100 turbine generators in nine hydroelectric power plants.
- Ovation supervisory control and data acquisition (SCADA) technology will integrate and communicate information between generating sites, UkrHydroEnergo and national despatch centres.
Renewable energy automation solutions

A single platform for your entire generation portfolio

For the past 20 years, we have built upon our successful fossil-fuel foundation to develop automation strategies for green energy sites: solar field, wind farms, hydroelectric, geothermal and biomass units. When implementing a management system that incorporates you with a single source of operational data and key performance indicators.

Emerson is the logical choice for a low-risk automation provider.

The Ovation SCADA capabilities allow easy integration to a main centre and better management of remote sites, such as wind farms, solar farms or hydroelectric plants. The Ovation SCADA solution expands your control boundaries beyond each generating site by providing tools to transfer information between these sites and despatch centres.

Ovation controllers or Remote Terminal Units (RTU) communicate to a full range of protocols to centralise your operations for each turbine generator, ICCP, and electrical substation.

large IT infrastructures, Emerson can help you meet the goal of harmonising and optimising the control and performance of your energy portfolio.

Emerson’s automation solution centralises management of all your assets into a single unified system. That solution includes full integration of the Ovation real-time monitoring and control system, with a powerful historical data analysis, reporting, and storage system to provide Acciona La Risca and Iberdrola Puertollano: Solar power plants – Spain

Ovation control technology for the world leaders in renewables.

- Ovation expert system controls and monitors the balance-of-plant for 50 MW solar power generation plants.
- Real time process graphic monitoring provided with intelligent management of alarms, set points, start-up and shut down sequences.

Image courtesy of ACCIONA.
Ensuring efficient integration of your green energy assets

Wind

Emerson’s Ovation system with SCADA technology provides supervisory management of wind farms at different locations, enabling more efficient operation of entire fleets from remote main operations centres. The Ovation system provides a unified platform that integrates data from the OEM SCADA subsystems as well as meteorological towers, and substation switchgear.

Concentrated Solar Power

Ovation provides a coordinated front end control strategy that ties the power island, steam turbine, balance-of-plant, and mirror controls together to operate the plant as a collective unit.

Solar Photovoltaic

Our solar control experience has also been proven with installations at photovoltaic plants. Our portfolio spans from individual unit control to fleet management between geographically dispersed sites.

Waste-to-energy

With the Ovation system, operators can monitor and control the waste-to-energy process from a single, completely integrated control system for the entire facility.

Biomass

While some biomass generating facilities are built new, some are existing coal-fired units that are converted to co-fire biomass and coal. Modifying a power generating unit to burn biomass could impact equipment efficiency and reliability. Ovation contributes to improved unit stability, responsiveness and thermal efficiencies.

Elektrownia Stalowa Wola S.A. – Poland

40 MW Biomass unit

- Burning of wooden chips, with additional (up to 20%) “agrobiomass” like straw, waste biomass etc.
- Ovation control system for balance-of-plant, turbine and boiler.
- Optimisation of boiler control and combustion process with biomass carbonisation and coburning.
- Wireless field instrumentation.
- Project management, engineering, commissioning.
Power generation & desalination on a single platform

Based on a well-proven platform

As experts in both power generation and water treatment, Emerson offers control solutions that meet the unique needs of desalination plants. Whether it is a distillation process such as multi-stage flash (MSF) or a membrane process such as reverse osmosis, the Ovation system ensures efficient operation. The system controls pressure, temperature and brine concentrations so as to optimise the water extraction efficiency. The system also provides superior process control solutions to minimise excess energy consumption – the most costly component of the desalination process.

For those desalination plants that integrate with a power station on site, Ovation offers specific power generation applications such as boiler and turbine control and can connect the desalination plant on to the same network, or connect multiple Ovation networks. Control strategies unify control of both the power station and the desalination from a single control station. Significantly, the Ovation controller is powerful and flexible enough to control both the fastest turbine logic and the relatively slow desalination processes.

Overall, Emerson can provide the project management, functional design, system software design, start-up, commissioning and engineering services for an optimised plant operation.

FISIA, Italy for Ras Laffan Power & Water Plant, Qatar

Successful integration of 800 MW combined cycle power plant and 227 MLD* desalination plant.

- Run on a common Ovation control system, chosen because of the proven capability to integrate large amounts of I/O.
- Emerson provided project management, functional design, system software design, start-up, commissioning and engineering services.

* MLD = million litres per day
At Emerson, we believe that outstanding solutions and services enable our customers to achieve continuous process improvement.

Service capabilities throughout Europe.
Power industry expertise

For project execution and services throughout Europe

We believe that our solutions and services enable our customers to benefit from continuous process improvement.

By partnering with Emerson, you can rely on us to deliver the best solutions and expertise, wherever it is needed. To ensure that you receive the highest levels of responsiveness, we have developed an ever-expanding network of local service capabilities connected to the main expertise centres in Europe. These resources have direct online access to system developers and applications experts at our global and regional headquarters and at our specialised industry centres.

From expert consulting services to world-class technologies, to comprehensive project management, field services and technical support, Emerson can provide total solutions for a single unit, or your entire generating fleet.

Highly qualified staff to support any power application

In all main European countries, our specialist teams, including a project manager, lead engineers and field services engineers, address your needs whatever your application – fossil, hydroelectric or renewable. You can rely on our knowledgeable process start-up experts to tune your turbine and get full performance from your unit.

With a European team of more than 1,000 engineers, including 300 specialists dedicated to the power industry, you can be sure of consistent support wherever you are.

Our skill set is notable, with the vast majority of our staff having qualifications relevant to providing you with skilled support.

Efficient tools and processes for collaborative work

Throughout Europe, we employ consistent methodology and tools that allow us to work, in a ‘virtual’ environment, as an expert team anywhere in Europe. Our secure electronic data management system (EDMS) enables document and information sharing over the internet and has proved to be an invaluable aid for project collaboration.
Smart documentation

The Ovation Documentation Builder tool allows automatic generation of project documentation, including system cabinet, I/O card arrangement, marshalling cabinet drawings, loop and wiring diagrams. Ovation Documentation Builder leverages the use of typicals and thus enables fast and efficient implementation for generating. The tight integration within the Ovation system and its synchronisation features guarantee the quality and consistency of project documentation, over years.

With Emerson’s proven front-end engineering and design (FEED) process, customers have a single point of accountability for their projects.

Control room design

To further underline our MAC capabilities, we also undertake the complete design and manufacture of your control room. We understand the importance of perfectly harmonised workstations, because ergonomic, stress-free working makes a critical contribution to successful operations.

Strategic flexibility

Our project management capabilities include engineering, procurement and construction (EPC) services from consulting to system design, to installation, start-up and post-operation services. Our flexible approach has led us to provide project management and execution services for thousands of power applications of all sizes, including the most complex projects where we have acted as both main automation contractor (MAC) and main electrical contractor (MEC).

Electrical design capabilities

Our strong experience in large projects has allowed us to consolidate in-house knowledge to manage applications with electrical components and services, including power distribution, medium and low voltage protections, excitation and voltage regulation.

Unparalleled experience and advanced engineering capabilities for on-time and on-budget delivery.
Ovation customer support programmes

SureService™ support

SureService is a programme designed to help you achieve your business objectives whilst reducing or containing your operating and service costs. It keeps your Ovation systems running at peak performance.

Our web-enabled SureService modules include online diagnostics, tutoring and archiving plus a host of other functions to maximise the performance of your control system and your plant. You can choose any or all of our service offerings so as to meet your specific operational needs and budgetary requirements leaving you to focus resources on achieving key business objectives. These include:

- expert telephone support (24/7)
- remote system diagnostics
- scheduled on-site services
- emergency on-site services
- parts exchange services

Our expert telephone support is available 24 hours a day, 7 days a week, through a single number, wherever you are, from Spain to Russia. Simply call the number above.*

The Ovation Guardian support module is part of SureService and displays system-specific data of your Ovation system through a secure web site connection. It is designed to provide information for better decision making.

Customised training programmes

We provide our customers with an exceptional level of education that spans our product portfolio. In addition to our standard courses, we are happy to develop on-site training solutions which are tailored to specific engineering, technical or operator requirements, as well as process training on turbine, unit and plant.

*Number may vary in a few specific countries
The Ovation expert control system, with SCADA capabilities, is a product of four decades of experience in process control for the power generation industry. It is now the world’s most powerful technology for secure operations and best-in-class performance.

*Technologies designed for power.*
Ovation system designed for power

The Ovation expert system: optimised to meet your unique needs

A key component of Emerson’s PlantWeb digital plant architecture, the Ovation expert control system is optimised for the global power generation industry. The system is equipped with special-purpose I/O modules to handle the unique control requirements associated with steam turbine, gas turbine, and boiler feed pump turbine controls. These include: speed detector module, valve positioner module, servo driver module, sequence-of-event with 0.125 ms resolution and wire break detection. The Ovation controller is designed for critical applications, can execute tasks at 10 milliseconds speed rate and is a truly distributed system. The robust and fault tolerant network has a 200,000 point capacity.

Unit co-ordinated control and advanced sequencing

The Ovation system offers unit co-ordinated control (UCC) that provides a co-ordinated front end control strategy that ties the boiler and turbine controls together. The UCC generates and regulates the set point for unit load (MW). The unit load set point or UCC MW demand may be generated from local operator entry, remote increase/decrease contact inputs, or internally generated contingencies such as runbacks and rundown.

Safety first

The Emerson approach to safety involves continuous diagnosis of sensors, logic solvers and final elements. The Ovation SIS solution, certified for SIL3 applications, implements safety functions with dedicated hardware, and provides both integration to the basic control system and separation required by IEC 61508 and IEC 61511 standards.

Ovation also features fully automatic start-up/shutdown sequencing. The operator, through ergonomic graphics, can easily monitor missing criteria and efficiently start-up units.
Maximising the benefits of your fleet

Generating real world, bottom line results

Ovation integrates plant control systems with corporate networks, providing and receiving accurate process data when and where it is most needed. By using connectivity tools, the Ovation system can transfer specific types of process information to and from third-party desktop applications.

Information management refined

Remote visualisation is easy to implement. The customised web-portal allows users to view system graphics and generate reports from any location. The Ovation system includes a native, bi-directional communication interface to OSI-PI software.

Enhance and manage your cyber security

The Ovation Security Center - a suite of security management tools and services - assists Ovation users to protect their power generation assets from cyber attacks. It allows users to reduce the cost of complying with Critical Infrastructure Protection (CIP) standards developed by the North American Electric Reliability Corporation (NERC), and adopted by most European companies.

Ovation SCADA capabilities for remote assets

The SCADA server allows for configurable polling and so optimises bandwidth. It supports connections through multiple communication network types to a variety of equipment used in renewable energy sites, including wind turbine controllers, mirror assemblies, substation controls and water level controls.

Worldwide platform complies with local regulations

Emerson is a global supplier. The Ovation expert control system is a worldwide platform and Emerson is committed to meet both international and local norms and regulations in the power industry.

This includes international standards such as IEC61131-2, IEC61131-3, American ASME codes & standards, GOST certification for Russia, European norms and directives like EMC, as well as KKS coding and VGB R170C guidelines for documentation.
Complete turbine control solutions

For every manufacturer

Over the years we have supplied thousands of steam, gas, and hydro turbine control solutions around the world. We have provided complete retrofits to some of the largest names in the industry including GE, ABB, Alstom, Westinghouse, Siemens, Mitsubishi, Zamech, LMZ, Skoda, Toshiba, BBC, FIAT and more. Emerson’s turbine control solutions offer control system retrofits, mechanical upgrades and associated services.

Precise control of steam, gas and hydro turbines

The Ovation turbine control system is engineered to accommodate the speed sensing requirements and hydraulic interfaces needed for expert controls. Whether your turbine is powered by steam, gas or water, the Ovation system offers a reliable cost-effective solution.

Through years of experience and recent acquisition, we have developed gas turbine solutions that incorporate all the design and operational knowledge proven in previous systems, while adding improved reliability and availability.

Hydraulic design capabilities

Throughout Europe, we have dedicated turbine control specialists who understand the impact of efficient turbine control on your ability to achieve maximum levels of reliability and availability. These specialists have experience in designing a complex, integrated solution including the electronic governor and the critical mechanical equipment used by a typical modern turbine.

Emerson provided the hydraulic components for 1,300 MW Brown Boveri steam turbines; the largest fossil turbines in the world.

Ovation uses the same base hardware and software for turbine control as it uses for the burner management system, combustion controls, balance-of-plant controls and SCR controls.

Ovation offers specialised I/O cards to meet the control requirements. Start-up and loading programs provide a smooth, efficient automated start-up of the turbine.

Cabinet for GE Mark V replacement.
Integration of all equipment

Mechanical & electrical equipment controlled by a common platform

The Ovation expert system integrates all processes. Not only the control of mechanical equipment such as turbines, boilers, pumps and mills, but also the control of electrical equipment - all performed from a common platform.

The Ovation controller combines Profibus DP V2, IEC 61850 technologies and Ethernet networking so as to interface with multivendor equipment in the low voltage and medium voltage arenas. It includes capabilities for the automation, monitoring and control of actuators, variable speed drives, automatic voltage regulation, transformers and generator protection.

Ovation also supports specific protocols designed for the power industry, such as DNP3.0, IEC60870-5-101/104 or ICCP for data exchange between generating facilities and despatch centres.

Voltage Regulator and Excitation System retrofits

The Emerson solution for voltage regulation and excitation is based on a fully redundant system that offers precise control for a broad range of synchronous generators. The solution is designed to provide a highly reliable retrofit solution for a number of OEM excitation systems and can replace most rotating, brushless or static excitation systems. This solution has the flexibility to be installed in new or existing enclosures to accommodate various environmental conditions and to fit the exact needs.

Machinery protection and prediction

Missed trips, false trips, and running blind are not acceptable in your plant. The CSI 6500 Machinery Health Monitor combines protection and prediction, with real-time performance monitoring and process automation. Integrated to Ovation, it provides the enterprise-wide information needed for real-time decision making.

Emerson demonstrated its technology leadership, vast experience and excellent service and support

Ian MacDonald
Barking Power, UK
SmartProcess optimisation solutions

Improve performance and profitability of power plants

SmartProcess plant optimisation software helps utilities to achieve optimised equipment performance for emissions compliance, temperature control, efficiency and overall continuous operational improvement.

By incorporating fuzzy logic, neural networks, predictive control and other tools developed specifically for the needs of our customers, SmartProcess has become the most advanced suite of optimisation tools available in this industry.

Plant-specific models simulate process variation and changing load levels, so SmartProcess identifies the precise control settings for continuous best performance. The plant model incorporates self-learning features that allow adaptation to long-term changes in the plant.

Each module of SmartProcess improves efficiencies throughout the process. Typical examples are:

- Improving unit responsiveness by increasing ramp rates and decreasing start-up times
- Reducing heat rate through boiler efficiency and spray flow reduction
- Reducing NOx, SO2, CO2 and opacity emissions
- Improving fleet management capabilities
- Monitoring and tracking of equipment performance against design specifications

Moreover, with SmartProcess solutions, Emerson provides consultancy services to audit the performance of your unit/plant and recommend potential ways of improvement, e.g. reducing throttling losses and optimising the combustion air, or the steam temperatures.
Scenario® simulation solutions

Transitioning personnel and technology during times of change

With Scenario, the complete understanding of complex operations and unique plant characteristics gained through years of on-the-job experience can be easily transferred from your current operations experts to the new generation.

With a choice of low-, medium-, and high-fidelity simulation options, based on state-of-the-art technologies, simulation is matched to the needs of each customer. The high-fidelity option combines Ovation workstations and customised plant models to create a real-time dynamic representation of all plant processes and relevant components. In this way, an environment is provided that precisely duplicates the actual control system.

Real-life scenarios

When used as a training tool, the real-life scenarios provided increase the skill level of operators so they can be confident at handling any event. Scenario can also satisfy the need to provide periodic refresher training and qualification for more experienced operators.

Scenario allows instructors to cover normal operations as well as possible malfunctions. Plant conditions can be preset and fault conditions injected. Instructors have the option to go backwards and review registered events and data. Such training can also be used to update experienced operators who can practice infrequent evolutions and faulted conditions on the unit.

Virtual controller technology

Scenario solutions offer a virtual architecture – applications developed for actual Ovation controllers run in Windows-based PC. In addition to being a cost-effective simulation strategy, the virtual controller technology offers ease of application transfer to and from the actual plant control system, as well as simplified DCS application upgrades.

By training operators how to start the unit faster to meet peak demand, we have the opportunity to not only enhance the plant’s operational performance, but our financial performance, as well.

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