

Solutions for Thermal Power Plants

- Automation & Controls
- Power Distribution
- Boiler Control
- Generator Control
- Steam Turbine Control
- Coal Handling
- Emissions Control Systems
- Auxiliary Systems
- Facility Management

Solutions in Energy!



Automation & Controls

Distributed Control System
SCADA & Telemetry

Power Distribution

LV and MV Power Distribution
Electrical Substations

Boiler Control

Burner Control System
WSC Regulation
Combustion air and flue gas
Sootblowing System

Generator Control

Excitation (AVR),
Synchronization
Protection
Generator Monitoring

Steam Turbine

Steam Turbine Controller
Special Turbine Measurements

Coal Handling

Coal Transport and Distribution
Stacker – Reclaimer Machines
Wagon Tippers

Emissions Control Systems

Electrostatic Precipitator
Slag and Ash Handling
Emission Measurement Solutions

Auxiliary Systems

Water Treatment Plant
Pumps and Drives
Instrumentation Solutions

Facility Management

Electrical Power Systems
HVAC
Security
Central plant
Facility Management System

Services and Support

Solutions for Thermal Power Plants

ELCOM is a **System Integrator** and our solutions for Thermal Power Plants, from fuel supply and plant performance to emission monitoring and grid automation are there to provide maximum flexibility and efficiency.

We offer comprehensive operation and maintenance services including:

- Engineering
- Manufacturing
- Delivery
- Integration and tests
- Full commissioning
- Training
- Support
- Lifecycle extension

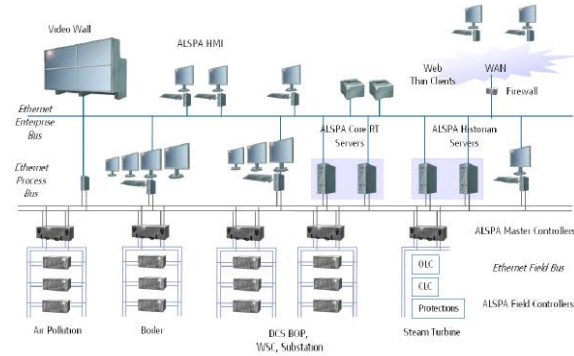
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Distributed Control System (DCS)

ALSTOM ALSPA® CONTROPLANT™

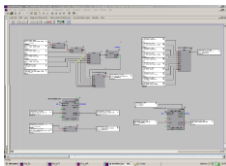
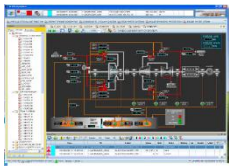
Distributed Control System for thermal power plants designed to improve plant efficiency, availability and power quality.

The ALSPA® CONTROPLANT™ DCS is a complete and powerful Distributed Control System designed to cover all needs during the entire power plant life-cycle. Adapted to projects with high requirements in term of redundancy and performance it suits large or complex control systems. Its modular architecture offers flexible solutions and fits projects requirements in term of performance, capacity and fast response time.



ALSPA 6 HMI

Controcad



Process Controller
MFC 3000



Field Controller
CE 3000



Safety Controller
CE 3500



SCADA & Telemetry

Our SCADA & Telemetry system offers maximum functionality and a user-friendly user interface. With this configurable and scalable system, you have the advantage of absolute openness to both the office environment and to production. An integrated process database and Plant Intelligence, for example, ensure transparency in production. Numerous options and add-ons extend and expand the scope of performance.

We offer SCADA systems on different platforms of different manufacturers such as Siemens, ABB, Schneider-Electric...It is up to customer or us to decide which platform is the best for each specific case.



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Low and Medium Voltage Systems and Solutions

ELCOM offers complete engineering, supply, manufacture, delivery to site, installation, commissioning, testing, and ensure the quality of the complete control and electrical system of your power facility is at the highest level.

We offer complete Low and Medium voltage solution compiled with IEC standards with instrumentation, control and electrical system integration for power plants. We use innovative brand name products in low and medium voltage electrical range of equipment for producing a reliable and safe system for distribution of electrical power.

Low Voltage Systems & UPS

ELCOM low voltage switchgear provides centralized control and protection of low voltage power equipment and circuits in industrial, commercial, and utility installations involving generators, motors, feeder circuits, and transmission and distribution lines. In the range of Low Voltage and UPS we offer by compiling the (IEC) standard for supply system in the range of 50–1000 V AC or 120–1500 V DC and extra low voltage for AC < 50 Vrms and DC < 120 V with turn-key solution.



Medium Voltage Systems

Medium voltage systems are custom engineered for distribution over wide range of medium voltage switchgear as for starting, synchronizing and paralleling power sources and motor control. Compact and quiet modular design assures easy application for any needs. Our systems are available for Medium Voltage applications from 1 KV up to 35 KV.



Substations with Automation & Control

Our prefabricated substations and automation system ensures grid stability and protects and controls substations with IEC 61850 protocol. We use brand name protection relays and measurement devices for integration into complete substation Power Control System (PCS).



ELCOM solutions for **Electrical Systems** and **Power Distribution** are precisely tailored to your requirements. We offer individual services and complete range of Power Management Solutions for LV and MV distribution systems.

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ELCOM offers Boiler Control from which the balance in mass & energy of in and out of the boiler is achieved. Inputs are fuel, combustion air or steam & feed water. Of these, fuel is the major energy input. Combustion air is the major mass input, outputs are steam, flue gas, radiation & soot blowing.

There are three general types of coal & oil combustion control schemes used:

- Control in series, parallel & series-parallel.

In series control, variations in steam header pressure cause a change in combustion air flow which in turn results in a sequential change in fuel flow.

In parallel control, variation in steam pressure simultaneously adjusts both fuel & air flows.

In series-parallel, variation in steam pressure set points are used to adjust the fuel.

Because no combustion system is like another, **ELCOM** considers each plant individually with full control and monitoring of the coal mills and coal feeders for and complete overview of the Boiler with all required measurements and data for overall better performance.

Soot blowing System

ELCOM offers Soot blowing system with local and remote control and automation for removing of the soot that is deposited on the furnace tubes and walls of a boiler during combustion.

Types of soot blowers: Wall Blower, Long Retractable Soot Blower (LRSB) and Air Heater Blower.

Depending of the location and the purpose a blowing medium can be:

Water, Steam or Air.



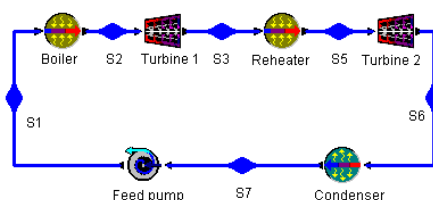
Burner Management System

ELCOM is a System Integrator and our overall Burner Management System (BMS) is a safety solution for power generation facilities that enables the safe start-up, operation, and shut down of the multiple-burner furnace section of a boiler. Despite the differing range of functionality, ELCOM burner management systems are suitable for each burner.



Water Steam Cycle Regulation

Boiler Feedwater and Condensate systems are critical to overall power plant performance, but can be one of the single largest energy consumers in the plant. **ELCOM** offers reduction of energy consumption and lower maintenance cost by controlling boiler feedwater and condensate flow with a variable speed drive rather than a throttling valve.



Combustion air and flue gas regulation

Reduce your energy consumption and improve operational performance with solutions from ELCOM.

Boiler fresh air and flue gas fans can be controlled by varying the speed of the electric motor that controls the speed of the fan. With this solution a better regulation of the air flow to the boiler is achieved.



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Excitation (AVR), Synchronization and Protection Systems

ELCOM offers Generator Control solution which features a standardized modular combination of the generator systems excitation (AVR), protection and synchronization. Generator Control is highly modular and can be easily adapted to meet various customer requirements.



Excitation System (AVR)

- Voltage regulator
- Power factor (cos) regulator
- Reactive power regulator
- Manual control (excl. current):
- Wide input power supply range
- All required software features
- Standard reference applications
- International certifications
- Variety of functions – limiters for excitation current, V / Hz, reactive current, stator voltage and stator current, etc

Synchronization System

It includes the functions of generator synchronization control, automatically synchronizing and paralleling synchronous generators with transmission lines and bus bars and bringing automatically the speed and voltage of the generator into a preset tolerance range before connecting safely both systems.

Protection System

Our Protection System with fast detection capabilities make it ideal for generator differential protection applications.

The detection parameters can be adjusted to create intelligent, application-specific functions that enhance the protection system and meet very specific requirements. Users will greatly value the savings achievable made possible by the common hardware platform.

Generator monitoring

Our generator monitoring is a fully automated temperature monitoring system. The system collects, archives, and analyzes the data for the operator, and generates reports defined by the operator. Hardware, software, and data configurations are tailored for each specific case.

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Steam Turbine Controller

ELCOM in cooperation with ALSTOM supports and provides services for ALSTOM ALSPA® CONTROSTEAM™ turbine control system which is capable of performing a large number of additional functions compared to standard systems in order to optimize plant operating, increase safety and simplify maintenance. We are offering:

- Turbine controller (Closed and Open Loop Control, sequencer)
- Protection system
- Monitoring system (Turbine Supervisory Instrumentation, Operating Data Counters)
- Intuitive and user friendly web based Human Machine Interface (HMI)

Main features are:

- Communication backbone based on remote I/O's (compact, hot swap COTS proven technology)
- High performance, deterministic fieldbus (Ethernet Power Link open standard)
- Reinforced safety through fail-safe design together with SIL3 dedicated CE3500 TMR protection systems.
- Open platform allowing integration of networks standards and protocols to third party systems communication and smart devices
- Fully automated start up and shut down
- Fully automated control of all turbine parameters: speed, load, frequency, temperature
- High plant availability thanks to its fault tolerant architecture

Special Turbine Measurements

When generating power, relies are on critical machinery every hour of every day. In these settings, machinery failure isn't just inconvenient, it can be catastrophic. Continuously monitoring critical asset parameters such as vibration, temperature, speed, and numerous other condition indicators is a proven method for anticipating and preventing mechanical failures and by delivering tangible benefits such as:

- Improved protection from catastrophic failures
- Better machinery reliability/availability
- Fewer process interruptions
- Enhanced maintenance/outage planning
- Lower maintenance and repair costs
- Longer intervals between outages
- Reduced insurance premiums

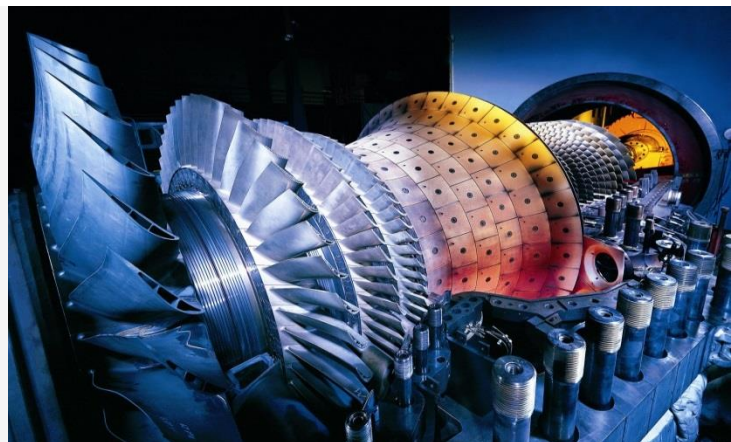


Certified

American Petroleum Institute's Standard API 670 and API
Canadian Standards Association (CSA),
Factory Mutual (FM),
GOST, ATEX, and CE requirements

ELCOM offers Bently Nevada* from GE Energy. The Bently Nevada 3500 Monitoring System provides continuous, on-line monitoring suitable for machinery protection and asset condition monitoring applications.

It represents most capable and flexible system in a traditional rack-based design and offers numerous features and advantages not provided in other systems. With ELCOM engineering team and our experience we offer full service and setting into motion of a system which improves overall safety of critical equipment.



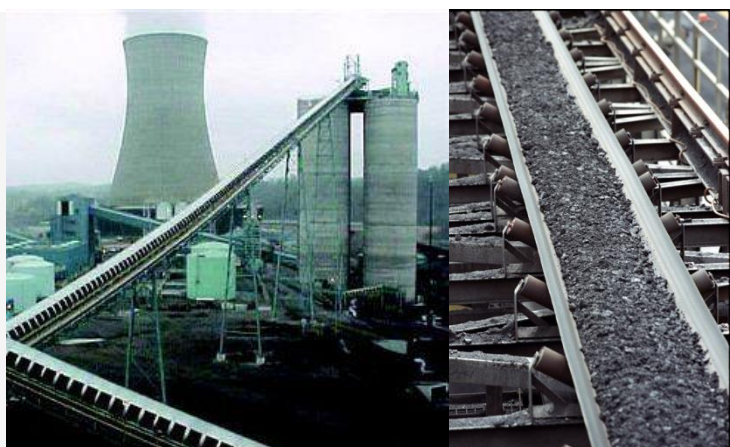
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Solutions in Energy!

ELCOM supplies complete **Coal Handling Systems** for coal fired boilers. We offer complete scope, from mechanical, hydraulical and electrical systems to full coal handling automation system. Coal handling systems are an integral part of a complete material flow and quality management system. Coal handling at utilities requires specialized technology and equipment from unloading to crushing and dust control to fire protection.

Coal Transport and Distribution

Fully automated operation from a central control room where operator knows at any time how much coal, in real time, is going to stockpile and by tracking tonnage and quality he has a complete overview of the process. By controlling transporter speed and knowing the state of the conveyor belts with measurements and sensors which send a feedback to the control system with closed control circuit a complete system gives outstanding performance.



Stacker – Reclaimer Machines

The coal can be stacked and reclaimed by various methods in order to provide an adequate treatment of the material and perform the necessary mixing and blending. One of the methods is Stacker-Reclaimer, process machines which are running with or without any local operator and are supervised by an operator in the central control room. This operation mode advantages, such as: Constant and optimised belt load and thus optimised material throughput, less equipment wear due to less stress factors, less faults and damages triggered by operator failures, reduced labour costs, and energy savings by smooth and continuous operation.



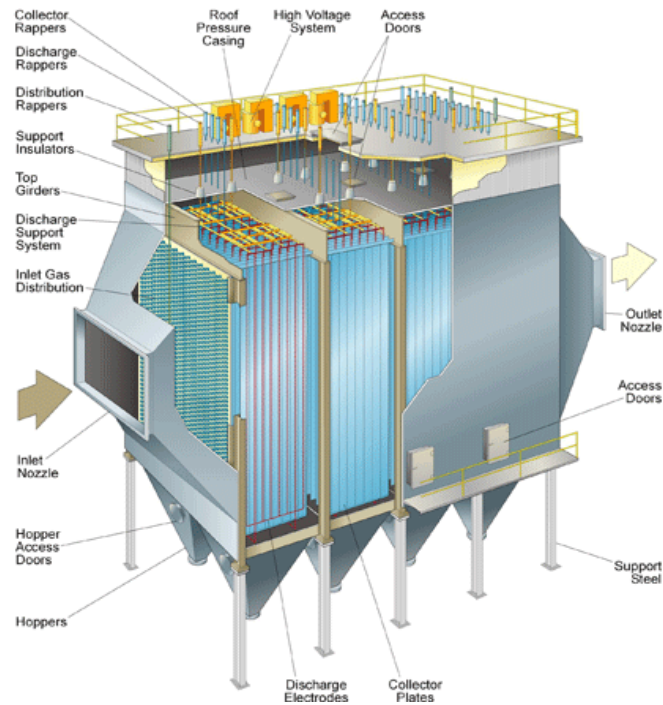
Wagon Tippers

We can deliver wagon tippler on turnkey basis to meet demanding requirements of our customer both in quality and price as well as lead time. The main frame of wagon tippler system is car dumper, and can be equipped with various kinds of dispatch vehicle arrangement and safeguards equipment to constitute the unload line. In the electric power plants the single wagon tippler system is the most popular one. We offer complete Wagon Tippler solution with full automation to meet dumping requirements. The process is monitored from the control room by one operator.



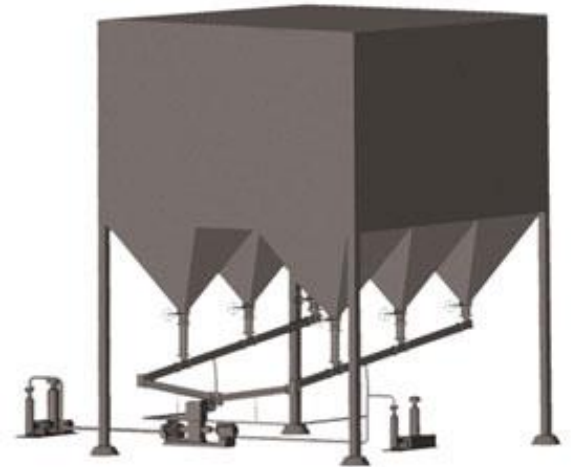
Electrostatic Precipitator

Electrostatic precipitation is a method of dust collection that uses electrostatic forces, and consists of discharge wires and collecting plates. A high voltage is applied to the discharge wires to form an electrical field between the wires and the collecting plates, and also ionizes the gas around the discharge wires to supply ions. When gas that contains an aerosol (dust, mist) flows between the collecting plates and the discharge wires, the aerosol particles in the gas are charged by the ions. The Coulomb force caused by the electric field causes the charged particles to be collected on the collecting plates, and the gas is purified. ELCOM with highly driven technical expertise and experience, we offer full system solution which comply with the harsh industrial standards. With our tailored system solutions users achieve higher benefits including better productivity, reliability and higher performance using top of the class control systems.



Slag and Ash Handling

Fly ash, also known as flue-ash, is one of the residues generated in combustion of coal, and comprises the fine particles that rise with the flue gases. Ash which does not rise is termed bottom ash. Fly ash is generally captured by electrostatic precipitators or other particle filtration equipment before the flue gases reach the chimneys of coal-fired power plants, and together with bottom ash removed from the bottom of the furnace is in this case jointly known as coal ash. ELCOM offers complete system solution for removal and pneumatic transport of fly ash from electric precipitator hoppers with monitoring and control of the process from a control room.



ELCOM offers complete range of Emission Measurement Solutions for analyzing and monitoring of flue gases arising from the combustion contain CO₂, oxide or soot particles.

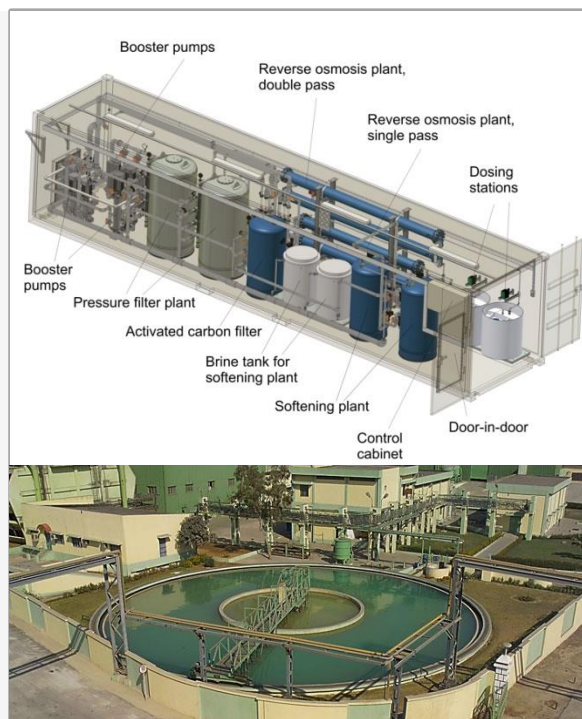
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Water Treatment Plant

Hardness, salt and all minerals which are a threat for the mechanical parts of the plant need to be removed from the water which is going to the boiler and that is done by a water demineralizing treatment plant (DM).

A DM plant generally consists of cation, anion, and mixed bed exchangers. Any ions in the final water from this process consist essentially of hydrogen ions and hydroxide ions, which recombine to form pure water. The capacity of the DM plant is dictated by the type and quantity of salts in the raw water input. Some storage is essential as the DM plant may be down for maintenance. For this purpose, a storage tank is installed from which DM water is continuously withdrawn for boiler make-up. The storage tank for DM water is made from materials not affected by corrosive water, such as PVC. The piping and valves are generally of stainless steel. Sometimes, a steam blanketing arrangement or stainless steel doughnut float is provided on top of the water in the tank to avoid contact with air. ELCOM offers complete system solution for demineralizing treatment plant.



Pumps and Drives

We deliver Pumping Solutions for Water Applications from brand name manufacturers. Based on our experience, we help you to transport and treat water and wastewater according to most stringent requirements. Pumping solutions for water transport and supply, desalination, water reuse and waste water treatment.

Everywhere where large drives and electric actuators are required in industry and infrastructure, ELCOM offers the ideal solution with precise calculations and experience that are combined to offer an optimal drives system.



Instrumentation Solutions

ELCOM offers wide portfolio of measurements, including standalone instruments, smart sensors and integrated measuring and analyzing systems from brand name manufacturers.

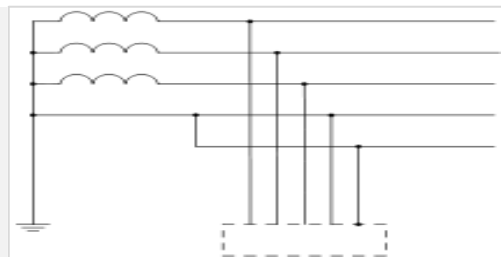
Analytical Instruments and Sensors, Field Instruments Configuration Tools and Accessories, Flow Meters, Pressure Transmitters, Process Level Sensors Recorders and Data Acquisition, Temperature Transmitters & Sensors.



Facility Management is a system designed to monitor and control the Electrical Power Systems, security, fire and flood safety, lighting (especially emergency lighting), HVAC control and ventilation systems in a facility.

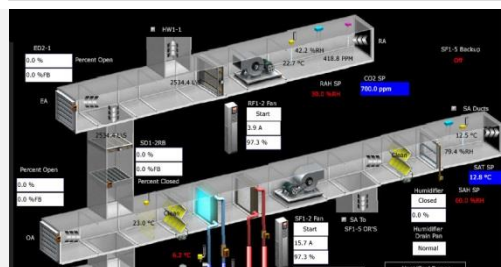
Electrical Power Systems

Power Distribution in Facility
Lighting
Cable and cable trays
Communication and telephones
Paging and loudspeakers



HVAC

HVAC Units
Air handlers
Constant volume air-handling units
Variable volume air-handling units
VAV hybrid systems



Security

Video surveillance
Access control
Security alarms
Fire safety system



Central plant

Chilled water system
Condenser water system
Hot water system



Facility Management System

Centralized control center
for management of the facility



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Solutions in Energy!

ELCOM is a **System Integrator** and our solutions for Thermal Power Plants, from fuel supply and plant performance to emission monitoring and grid automation are there to provide maximum flexibility and efficiency.

Services

Our scope extends across the entire chain. It begins with base and detailed design, engineering, project management, installation and commissioning. This incorporates all the electrical, control and instrumentation equipment, from the electrical balance of plant to the substation and grid connection, and from the instrumentation and field devices to the distributed control system. Our unique engineering combines the understanding of process properties with a detailed knowledge of materials and equipment. These services help our clients minimize costs, improve efficiency, meet safety standards, and ensure that installations conform to operational and design parameters. We have carried out a wide range of projects, building large scale systems and using the best brands and the latest equipment for the Power Generation Industries.

We offer complete **Turn-Key System Solutions** with advanced and integrated technical solutions in the field of electrical, hydraulic, pneumatic and mechanical drive systems and controls.

One of the specialties of ELCOM is engineering and realization of complete process control systems.

ELCOM expertise and system products are offered in next segments:

- Automation & Controls
- Power Distribution
- Boiler Control
- Generator Control
- Steam Turbine
- Coal Handling
- Emissions Control Systems
- Auxiliary Systems
- Facility Management

We offer comprehensive operation and maintenance services including:

- Engineering
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- Integration and tests
- Full commissioning
- Training
- Support
- Lifecycle extension

Support

All of our support services can be combined into a tailor-made contract with a fixed-fee to help you meet your specific budget and service requirements.

We ensure the support you need when you need it.

Online support

- 24/7/365 Phone intervention for guidance and technical information.
- Remote desktop connection for urgent actions.

On-site support

With our On-site Services, ELCOM engineers can assist your maintenance staff with preventative and reactive tasks. Our team of experts is available as needed, regularly scheduled, or on a full-time basis to meet your specific needs and maintenance strategy.



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