Providing Electrical and I&C installation in

nuclear power industry

elmont

Mission

Our principal mission is to meet all expectations and needs of our customers, to ensure their full satisfaction and to foster long-term partnerships.

Vision

We seek to consolidate our current position in the home, European and third markets and, with the help of highly qualified human resources, to become the most trustworthy and environmentally friendly business partner in the areas of electrical installation works and maintenance of nuclear installations, power generation facilities, paper mills and other industrial structures.

Goals

Future growth is essential to the fulfilment of our company's vision. We aim to maintain and improve the quality of service, to earn valuable references and to gain recognition both at home and abroad. We will continue to work hard to identify the needs of our customers, in order to be able to meet even the most complex of needs. Our main aims also include fostering long-term successful cooperation with our business partners.

What we do

All types of electrical installation work on new developments and maintenance work on electric power facilities.

A particularly important area of focus for us is the implementation of technological upgrades to nuclear installation systems.

Engineering

and project coordination

- Project management on complex structures, e.g. construction of new, and reconstruction of existing, electric power facilities,
- preparation of project documentation and installation packages,
- expert and technical support for developers in purchasing equipment, materials and services,
- development of installation and maintenance procedures,
- coordination and cooperation with equipment manufacturers,
- development of configuration testing and commissioning procedures,
- production of MARK-UP and AS-BUILT documentation.

Installation

and maintenance

Work on high-voltage (HV) systems:
- 400 kV collector substations,
- 400 kV switchyard bays – high-voltage and secondary equipment.

Work on medium-voltage (MV) systems:
- installation and maintenance of 6.3 kV–21 kV circuit breaker configurations, power transformers, motors and ancillary devices in switching substations.

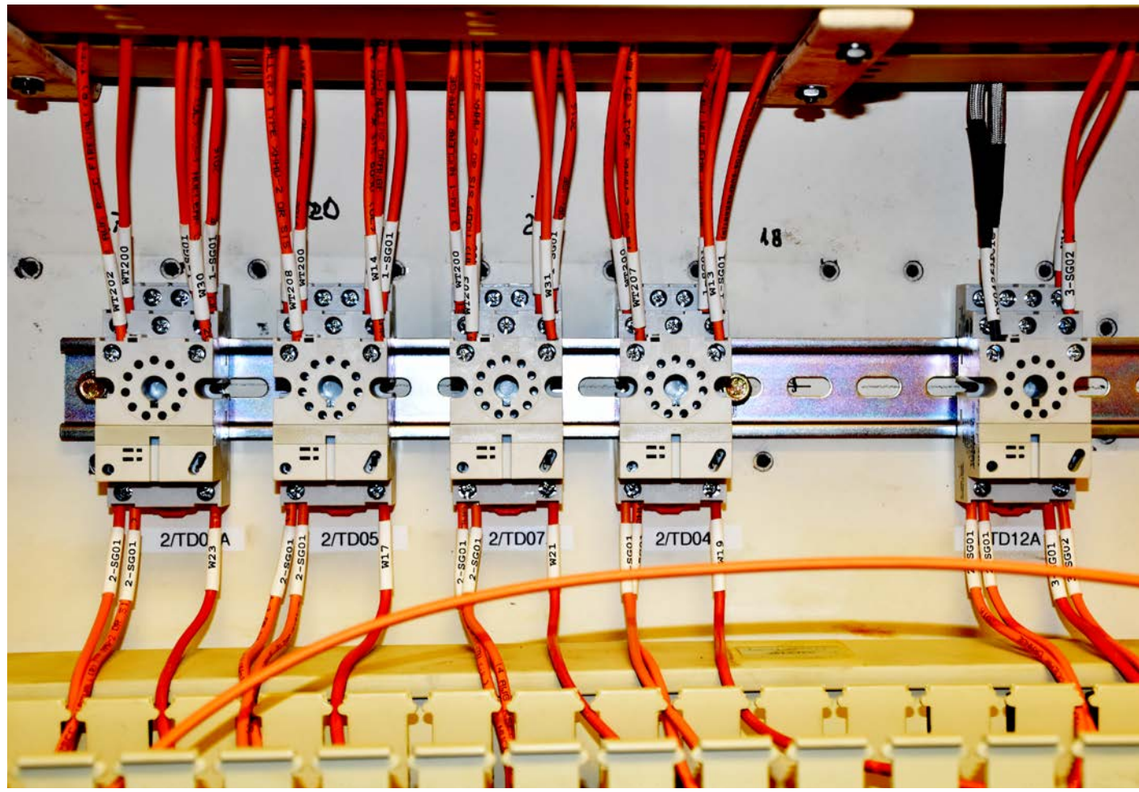
Work on low-voltage (LV) systems:
- setup and maintenance of electrical installations,
- setup, installation and maintenance of switch panels, distribution boxes and control panels,
- installation, connection and maintenance of energy consumers.

Work on instrumentation:
- installation and wiring of instrumentation equipment and configurations,
- wiring of process control boxes,
- instrumentation connections.

Work in telecommunications:
- assembly of telecommunication boxes and cabinets,
- setup of telecommunication networks (telephone, network computer, optical cable connections).

Security systems:
- installation and setup of video surveillance systems and connections,
- installation and setup of security alarms and fire sprinkler systems and connections.

Other electrical installation services:
- assembly and installation of electrical equipment holders and supports,
- installation of cable brackets and metal conduits,
- installation of electrical equipment,
- laying of cables (power, control, instrumentation and optical),
- welding of optical cable connections,
- installation of lightning conductor systems,
- laying of installations in potentially explosive environments.



Electrical measurements

and testing

- Cable and wire continuity testing,
- insulation resistance measurements of cables, motor windings, heaters and other electrical equipment,
- functional testing of circuits, protection switches and other electrical equipment,
- indoor light intensity metering,
- electrical installation measurements and checks,
- switch panel checks and testing,
- measurements of medium-voltage cables and equipment, diagnostic measurements and voltage endurance testing (dissipation factor – tangent delta and partial discharge),
- optical cable connection testing,
- performance of certified measurement up to class CAT-7.

Continued support

Regular maintenance

Our company provides ongoing support for the maintenance of electrical equipment. During regular operation, we engage in carrying out what is known as preventive maintenance, meaning predetermined maintenance work is completed according to schedule before any malfunction or shutdown occurs. The standard preventive activities carried out by Elmont d. o. o. include: preventive electrical equipment checks, maintenance work on outdoor and underground electrical installations and electrical installations in technical and non-process facilities, and other maintenance work as requested by the customer.

With our specific know-how and extensive experience, we are able to meet even the most complex customer needs.

Elmont d. o. o. Krško is primarily engaged in providing services to the nuclear industry. Our company performs ongoing maintenance work, cooperates in the implementation of technical upgrades and also places a strong focus on participating in refitting activities.

Technological upgrades

(modifications)

Technological upgrades
are critical to achieving high safety standards and long-term operation of electric power facilities. In the past and in recent years, Elmont d. o. o. took part in performing crucial technological upgrades:

- reconstruction of the 400 kV switching substation,
- replacement of the main generator stator,
- extension of the fire alarm system in the technical section,
- replacement of the Krško NPP alarm system,
- upgrade of the backup power supply system – installation of a new backup diesel generator,
- extension of the cooling tower system,
- replacement of the turbine control and protection system,
- replacement of the process water pretreatment and treatment technology,
- optimization of temperature measurement in the reactor coolant system,
- installation and connection of new main transformers,
- upgrade of the reactor coolant pump motor.

Professional and reliable support during maintenance outage. During scheduled maintenance outages of the Krško NPP, Elmont performs regular follow-up refitting work as part of the electrical maintenance division. This includes the following electrical installation and maintenance operations:

- electrical installation work on HV rotating machines,
- maintenance work on electrical installations of lighting systems,
- maintenance work on low-power branch circuits and electrical wiring,
- maintenance work on underwater and floating lighting systems and non-process electrical equipment,
- overhaul of electric control boxes and panels of backup diesel generators,
- maintenance work on main and unit power transformers,
- maintenance work on 6.3 kV electrical devices,
- maintenance work on 400/110 kV electrical devices,
- maintenance work on 21 kV electrical devices,
- maintenance work on 0.4 kV switchgear and motor control centres (SWG and MCC) and their components,
- maintenance work on heating devices and their components,
- maintenance work on electrical boxes and LV devices in various technological systems maintenance work on 118 VAC and 125/220 VDC systems and their components,
- work on relay protection devices used by the Krško NPP and on MCCs,
- cable aging management activities,
- electrical installation work on the equipment of LV rotating components.

The list of tasks also includes all other maintenance work carried out on electrical installations and equipment during scheduled maintenance outages.

Elmont d. o. o. Krško holds a valid Licence for carrying out radiation practices issued by the Slovenian Nuclear Safety Administration.

Our people

The people are what makes a company successful, which is why at ELMONT d. o. o. we are committed to providing a safe, positive and quality work environment. Highly qualified professionals, whose personal references enable them to effectively manage even the most complex of projects, have been with the company since day one. In addition, they pass their knowledge and experience down to their younger colleagues, who are full of fresh ideas and eager to learn.

Carefully selecting our future workforce.
At Elmont d. o. o., we seek to maintain a high level of human resource structure:

- by providing scholarships and, later on, jobs to promising secondary school and higher education students, through continuous training,
- by developing a sense of belonging to the company,
- by fostering good relations among employees and by creating a safe and constructive work environment, all of which contributes to zero employee turnover within the company,
- by providing incentives for our employees,
- through long-term human resource planning.

Our employees also possess some specific know-how, competences, skills and experience:

- certified electrical engineers,
- authorized works manager and authorized construction site manager,
- authorized supervisor for complex, less complex and simple developments,
- authorized project engineer for electrical installation, electrical equipment and telecommunication plans,
- authorization to perform low-voltage work,
- radiation protection level RZ-3 for performing work in a radiologically controlled area (RCA),
- radiation protection level RZ-2 for works managers who are in charge of work inside a radiologically protected area,
- qualification for controlling devices in potentially explosive atmospheres (EX equipment),
- qualification for conducting audits of nuclear quality assurance programs per ASME NQA-1,
- conducting internal audits based on ISO 9001, ISO 14001 and ISO 45001,
- national vocational qualification for checking electrical installations,
- national vocational qualification – safety officer,
- certified welders (AWS D1.1 – Track Welder Performance Qualification),
- visual weld inspections based on DIN EN 473 (Certificate for personnel engaged in non-destructive testing) and ANSI/ASNT CP-189,
- mentors for practical training and practical education in accordance with education programmes to obtain a formal qualification.

Management
systems

Care for the environment and the health and safety of employees is a constituent part of the company's business policy and organizational culture. The company's key strategic focuses also include quality of products and services and continual improvements to processes and procedures. The company management system is set out in the Management Systems Policy Manual. In pursuing the above focuses, we follow an integrated management system with standard-based certification.

ISO 9001
The quality management system based on the ISO 9001 standard was implemented in 1997. Once implemented, the system allowed us to effectively streamline process management and to significantly improve the quality of services, which in turn resulted in increased satisfaction among our business partners.

ISO 14001
We are mindful of the fact that keeping the environment safe and healthy is a basic precondition for successfully achieving our set goals. Environmental management system guidelines are set out in the ISO 14001 standard, which was implemented by our company in 2000. This certification made a substantial contribution to raising environmental awareness among all the company employees and all external collaborators. We make continuing efforts to prevent or mitigate negative impacts on the environment. In fulfilling our set goals and programmes and in managing the impacts of our operations on the environment, we adhere strictly to the law and seek to achieve continuous improvement.

ISO 45001
Certification based on the ISO 45001 international standard – Occupational Health and Safety Management System was awarded to our company in 2018. We make every effort to ensure that our employees perform their jobs safely and that the business process provides for their good health. The occupational health and safety system is planned systematically and incorporated into the company's business management system. It is supported and followed by all employees.

The company's work processes are in compliance with the quality assurance principles for nuclear installations as defined by the U.S. Regulation 10 CFR 50, App. B, and with the IAEA GSR Part 2 Safety Standard as set out by the International Atomic Energy Agency.

Of the few hundred projects we successfully completed over the last 25 years, the following deserve a special mention

Construction of emergency control room – remote shutdown capabilities

The main goal is the relocation of control loops for 1E equipment (pumps, fans, valves) from Shutdown Panels (SDP) to the new Emergency Control Room (ECR).
A complete Emergency Control Board was installed in the new location and connected to the main island with 130 km of cables.

Bunkered building (BB2 project) with support systems

The BB2 project, which was part of the third phase of the Krško NPP Safety Upgrade Programme (SUP), consists of the BB2 building project and the connection of various new systems to the existing NPP systems, buildings and components.
The BB2 Project consists of four modifications: "Alternate Safety Injection (ASI) system", "Alternate Auxiliary Feedwater (AAF) system", "BB2 building with support systems", "BB2 Emergency Electrical Power Supply".
The BB2 building was used for the installation of key technological systems and equipment: borated and demineralized water tanks, AAF and ASI pumps, valves, pipelines and other supporting (auxiliary) equipment.

RCS temperature measurement optimization

Resistance temperature detectors (RTDs) were installed directly in the primary coolant pipe. To accommodate for changes to the primary coolant temperature measurement system, protection boxes were also upgraded with new controller cards.

Reconstruction of the 400 kv switchyard of the Krško NPP

- Reconstruction of two 400 kV transformer bays (SYCA01 and SYCA02),
- reconstruction of 400 kV busbar system,
- reconstruction of three 400 kV transmission line bays (Maribor, Tumbri 1 and Tumbri 2).

Upgrade of technical security systems due to elevated water levels of the Sava river

Modification to adjust for the impacts of Brežice HEPP on technical security systems of the Krško NPP. Due to the elevated water level of the Sava river, which in normal conditions is 3 m higher than the current level upstream of the dam, it is necessary to adapt the technical protection systems to the new conditions. The new system covers the left and the right bank of the Sava river.

Reconstruction of the operation support centre – OSC

As the common areas of the shelter and the OSC in the basement of the AD2 administration building did not meet the requirements set out in DEC, a new facility was built within the Safety Programme Upgrade for the OSC function. It provides safe places for living and working of (up to) 200 members of the intervention team, who will remain at the Krško NPP site in the event of a serious accident or emergency to mitigate the effects of a nuclear accident on the local and wider environment. The facility allows fully autonomous operation and living for the first seven days after activation.

Spent fuel dry storage building (ongoing)

The modification consists of adding the HI-STORM (acronym for Holtec International Storage Module) FW system (system which has been specifically engineered to withstand sustained flood and wind) for storage of spent fuel and HI-STAR system for transport of spent fuel. The modification is classified as Important to Safety (ITS), Seismic Category I. The basic function of the Dry Storage Building (DSB) is to protect the cask from environmental conditions (flood, earthquake, etc.) and to reduce the dose rate outside the DSB as well as to reduce the dose in the Cask Handling Area, CTF and Technical Area.

Fire detection system upgrade

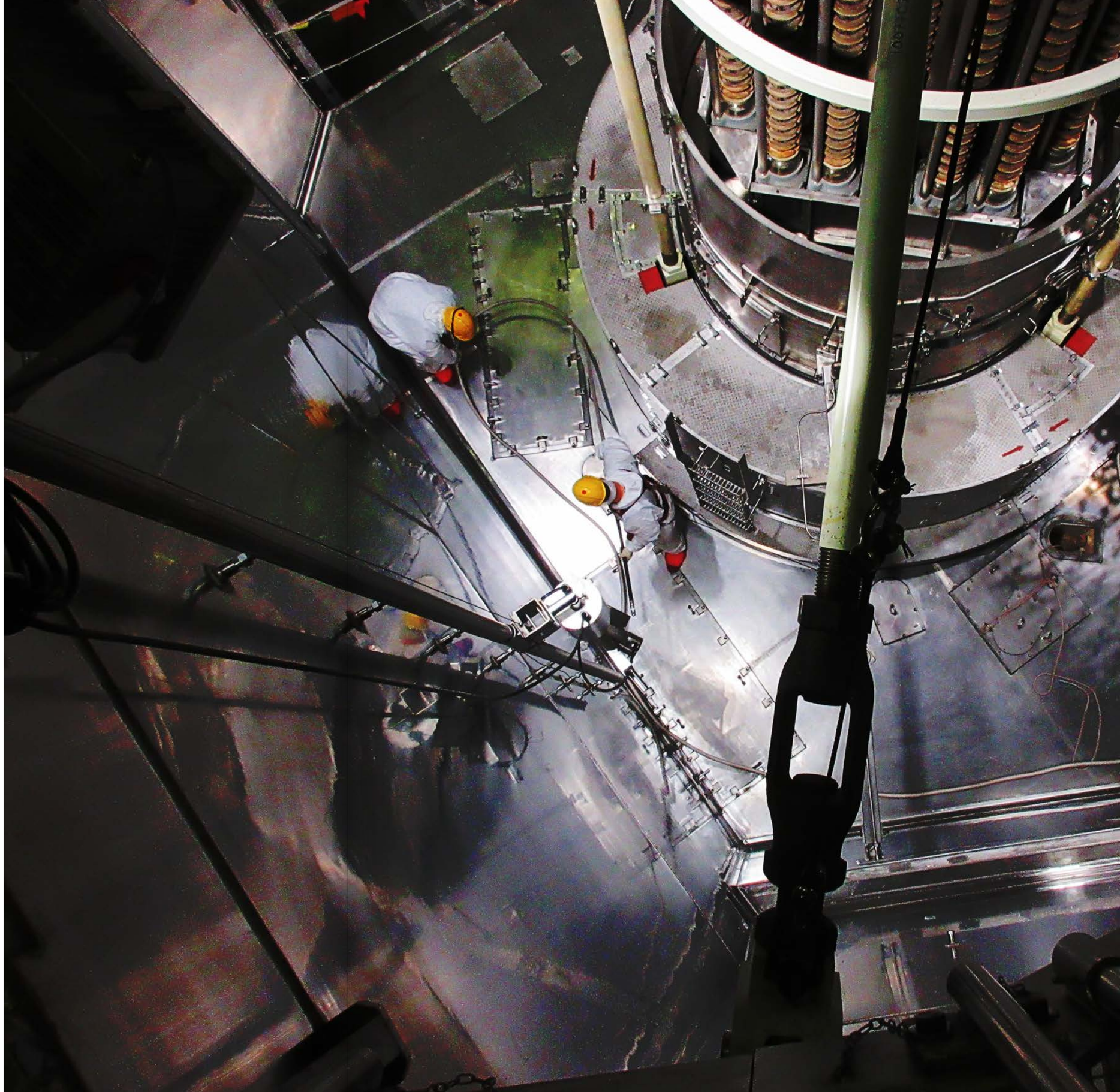
The existing fire alarm system was replaced and upgraded to enable more accurate ways of determining the location of fires. The existing fire alarm system has been extended to locations that have not been covered by the originally built-in system. Work was carried out during the power plant's regular operation and during scheduled maintenance outages in 2011, 2012 and 2013.

Replacement of the DEH turbine control system, turbine emergency trip system and MSR (moisture separator reheater) control

The old digital electrohydraulic (DEH) system of the turbine control system was replaced by a new programmable digital electrohydraulic (PDEH) system.

Replacement of 125V DC and 220V DC chargers

The modification includes the replacement of old chargers with three 125V DC chargers and one 220V DC charger, as the lifespan of existing chargers has expired and spare parts for old chargers are no longer available.



Enhancement of the emergency power supply

Providing an alternative power source in the event of a system-wide AC power outage, the system upgrade is an improvement to the power plant's backup power supply system. For this purpose, a diesel generator with a corresponding control system was installed in the new building.

Pressurizer PORV bypass

Modification "Pressurizer PORV Bypass" is the one from Krško Safety Upgrade Programme (SUP)
The pressurizer PORV bypass system consists of two motor operated gate valves and two electrical penetration assemblies (EPA) installed in the existing spare containment penetrations.

Upgrade of BB1 electrical power supply

Part 1 and 2: Purpose of implementation of Bunkered Building Electrical Power Supply is to support the installation of the Remote Shutdown Capabilities (RSC) and to enable electrical power supply for the Safety Upgrade Programme (SUP) Phase 2 and Phase 3 modifications. Due to an increased number of electrical loads and demands from SUP, the BB1 Electrical Power Supply needs to be adapted for the incorporation of new equipment. This Safety Upgrade Programme is being implemented in response to the Fukushima accident.

Installation and connection of new main transformers

The two existing main transformers were replaced in order to reach full capacity. Also installed was a continuous gas and transformer monitoring system.

Krško NPP alarm system-project

The dated alarm system in the main control room was replaced by a fully redundant, state-of-the-art digital alarm system.

Preparation of interfaces for new rcp motor installation on RCPCPC01-MTR location

The electric motor of the reactor coolant pump was reconditioned and upgraded. BIS screens (monitoring instrumentation) for monitoring bearing temperature, bearing oil levels and motor vibration were upgraded.

IPB cooling unit supply and replacement

Modification provides the redesign and replacement of the original IPB cooling unit (CU). It is needed for unrestricted service and energy transmission at max. (880 MVA) power level. The new IPB cooling system design will provide uninterrupted forced-air cooling to the bus duct.

Krško NPP river dam accommodation due to Brežice hydroelectric power plant construction

Krško NPP River Dam Accommodation due to Brežice Hydroelectric Power Plant Construction; RD process control system with new redundant PLC controlled system. The basic function of the new system is identical; however, some additional new features have been included in the system.
The main functions of the RD control system are:

- maintaining the desired level of the Sava river, by controlling the river gates,
- measuring of all required parameters related to the operation of the RD DAM,
- monitoring and calculation of all required parameters (ΔT, river T, river H and Q),
- alarming the MCR staff in the case of malfunction of the system and/or deviation of the control parameters.

Generator load break switch supply and replacement

The scope of the modification is the replacement of the existing Generator Load Break Switch (GLBS) manufactured in 1977 by Brown, Boveri & Co (BBC), and its auxiliary equipment, with a new ABB Generator Load Break Switch (GLBS), type HEC 7C, having its power transfer capability consistent with the generator output rating following generator upgrade.

Generator excitation system supply and replacement

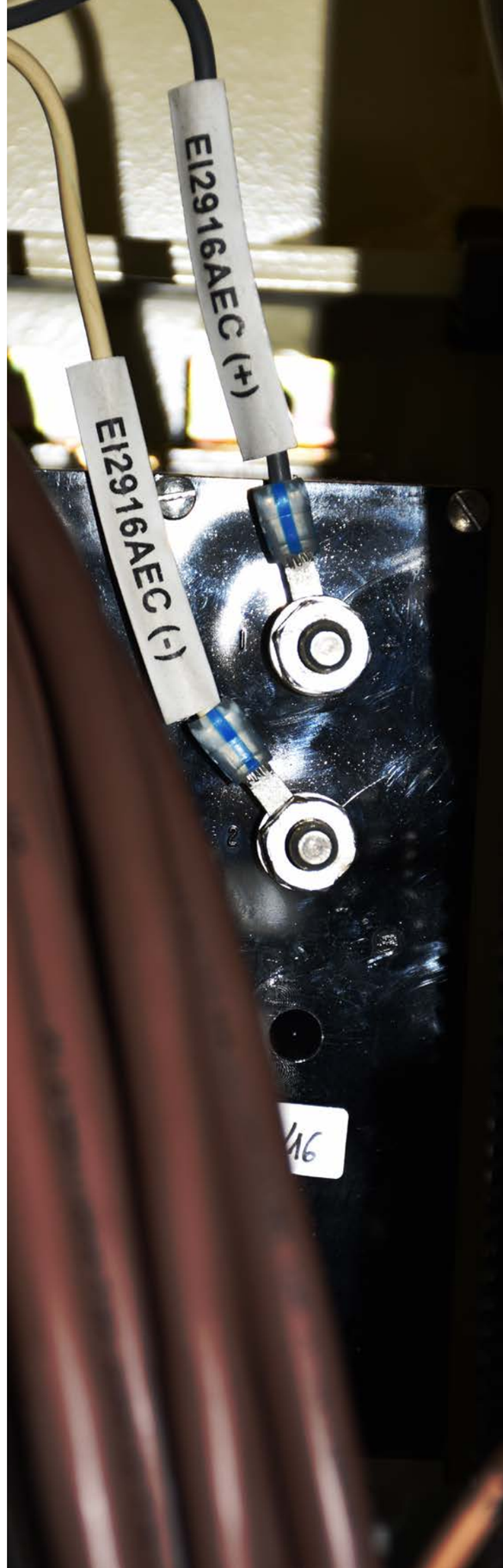
The objective of the modification is to replace the existing Automatic Voltage Regulator (AVR) of the WTA (Westinghouse Trinistat Power Amplifier) type. The two existing AVR cabinets will be completely demolished and in their place, three whole new cabinets will be installed. The functionality of the new system will remain the same or be even better. The new excitation system digital voltage regulator (DVR) is based on the Končar-INEM digital, fully redundant, regulation and control system for electric machines, DIREMK (Digital Regulation of Electric Machines Končar). A powerful programmable microprocessor unit is the essence of the system. It enables performance of the complicated control and regulation tasks in real time with high accuracy, reliability and speed.

Replacement of the ICCMS control cabinets

This modification proposes the replacement of existing ICCMS cabinets at the Krško NPP with new cabinets. Direct indication of the vital ICCMS channels will also be wired to the Emergency Control Room as well as to the MCR MCB. The new ICCMS will have the same functionality as the original ICCMS with the added feature of transmitting selected duplicate signals to the new Emergency Control Board (EMCB) to be set up in the Emergency Control Room (ECR). The ICCMS will be qualified for the Design-basis Accident as a part of the Post Accident Monitoring System.

Replacement of FP system electrical panels

The objective of the modification was the replacement of the 11 Grinnell fire protection control panels installed in different locations across the power plant.
The existing electrical panels, based on relay logic, were replaced with new ones with microprocessor units. Similar Viking VFR-400 panels have already been installed for DG3. The purpose was to maintain the existing functionality of the existing control panels.



RCS and CNT alternative cooling design

Krško Nuclear Power Plant (NPP) has decided to take steps for the upgrade of safety measures to prevent severe accidents and to improve the means to successfully mitigate their consequences.
One of the Safety Upgrade Programme (SUP) – Phase 2 projects was the RCS and CNT Alternative Cooling Design project.
The RCS and CNT alternative cooling system with all its SSC was designed and structured in accordance with the design extension conditions (DEC) requirements specific for the Krško NPP design and site location. The RCS and CNT alternative cooling design, in combination with mobile equipment (pump, flex hoses), is considered for severe accidents. The new ARHR system meets the requirements for RCS cooling performance as the current RHR system.

ECR/TSC HVAC and habitability systems

The existing BB1 Building is a Safety Related, Seismic Category I reinforced concrete structure, which consists of the ground floor and the first floor. An unoccupied room, i.e. Spare Room 2, as well as existing toilets and stairs were used for the construction of the new ECR/TSC.
Spare Room 2 on the first floor was used as the new ECR/TSC. The existing toilets were partly reconstructed into a decontamination room. The stairs were reconstructed into an access control point into the ECR/TSC. A new machinery room was constructed at the roof of the BB1 Building, where ECR/TSC HVAC equipment, including electrical cabinets, panels and necessary cable distribution were installed. A part of HVAC equipment was also installed on the roof of the BB1 Building and on the roof of the machinery room.

Registered name	DD Elmont Trading, engineering and manufacture of electrical devices and installations d. o. o. Krsko
Registered name (abbreviated)	Elmont d. o. o. Krško
Address	Cesta krških žrtev 135/e, Krško, Slovenia, Europe
Telephone	+386 7 49 125 00
Email	info@elmont-kk.si
Web	www.elmont-kk.si
General manager	Metod Pirc
Procurators	Robert Seme, Ivan Čolak
VAT identification number	SI78402930
Registration number	5829119

elmont