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“Partners Engineering” Ltd has been founded in 2009 r. and strives to conduct policy, aimed at:

- Continuously expanding contacts and business relations with customers , consumers and partners nationality and internationality to achieve a substantial presence in the field of energy projects.
- Achieving a smooth economic growth by increasing volume and variety of quality products offered by us.
- Implement a system for continuous optimization of organizational infrastructure.
- Effective management of all processes.
- Prevention of the prerequisites for claims and objections from customers related to our business.
- Providing and maintaining a high level of qualifications of all employees and associates.
- Enabling the full realization of each employee under its jurisdiction and powers.
- Maintaining trust and loyalty throughout the team.

“Partners Engineering” Ltd is specialized in the following fields of expertise:

- ✓ Lifting transport equipment – cranes, elevators, conveyers and specialized equipment.
- ✓ Automated systems for process optimizations in storehouses.
- ✓ Hoist and drive components: electrical drives, load-holding devices, winches, crane trolleys, drive units and mechanisms.
- ✓ Mechanized units in energy, cement and chemical industry.
- ✓ Renewable energy sources.
- ✓ Automated control systems.
- ✓ Radiation and emission control.
- ✓ Software development.
- ✓ Electrical equipment and installations.
- ✓ Non-standart equipment.
- ✓ Analysis and design.
- ✓ Subscription servicing and maintenance.

Partners

“Partners Engineering” Ltd has partnership with the following companies:

- **Rockwell Automation Inc** – RcSI recognized system integrator



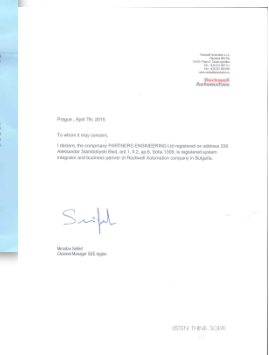
- **Stroina Transmissions d.o.o. – Slovenia** – sales agent: motor gears, motor boxes and transmissions



Certificates



- The company has implemented Integrated management system (IMS), including:
 - * EN ISO 9001:2008 Quality system.
 - * BS OHSAS 18001:2007 Occupational health and safety assessment series standart.
 certified by BUREAU VERITAS CERTIFICATION
- “Partners Engineering” Ltd is certified with:
 - Certificates for modernization, reconstruction and maintenance of lifting equipment , elevators and high-risk facilities.
 - Certificate for recognized system integrator RcSI of Rockwell Automation Inc products.



Lifting transport equipment

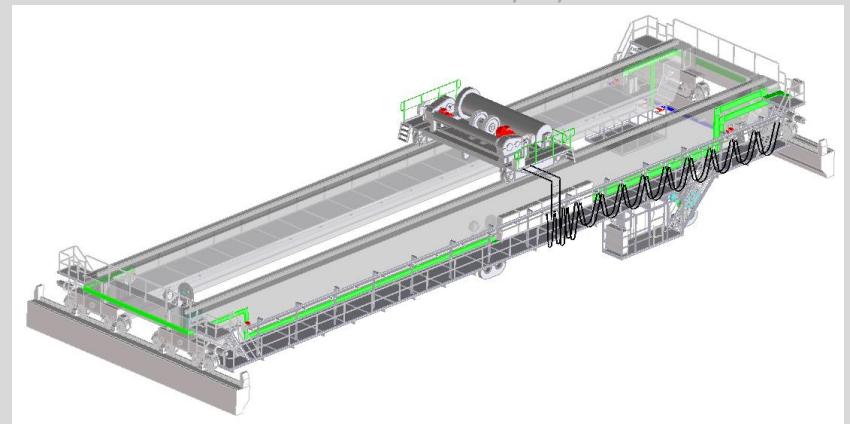
“Partners Engineering” Ltd

is specialized in design, installation, modernization and reconstruction, legalization of documents, service and maintenance of:

- **Bridge cranes (single and double girder).**
 - **Gantry cranes.**
 - **Jib cranes.**
 - **Passenger and freight elevators.**
 - **Specialized cranes and hoist units.**
 - **Transport machines for continuous processes.**
 - **Conveyors.**
 - **Hoists, winches, crane trolleys and components.**
 - **Drive units, rail roads and metal bearing constructions.**
- covering whole range of services.



Main beam and cabin of 200/32/5 tone crane

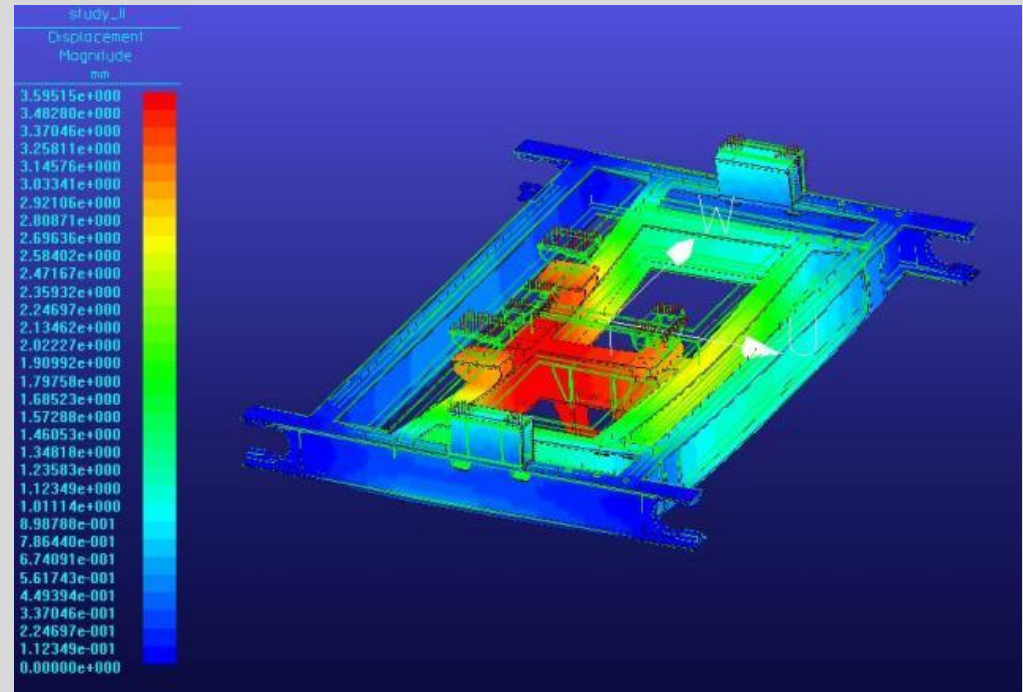


3D model of 200/32/5 tone crane

Lifting transport equipment

Engineering:

- Analysis
- Aging determination
- Expert evaluation
- Feasibility studies
- Planning and design
- Construction
- Functional testing
- Documentation for legalization
- Commissioning
- Service and maintenance



Testing of the crane beams and all the basic mechanisms by using specialized software

Lifting transport equipment

CRANES

Drive units:

- smooth movements, rotations and manipulations with step and stepless driven gear motors complete units.
- drive control with 2-speed motors and with frequency invertors with network communication.
- hoist control with specialized frequency invertors (with Flux vector control and Torque proving function) in heavy duty conditions and continuous load monitoring.

Control:

- classical control with relays / contactors (ladder diagrams).
- automated control with PLC s and displays.
- operator cabin equipment, seats and control units with buttons / joysticks, pendant control stations and radio - / infrared remote control units.
- remote monitoring and visualization; SCADA; data archivation (log files).

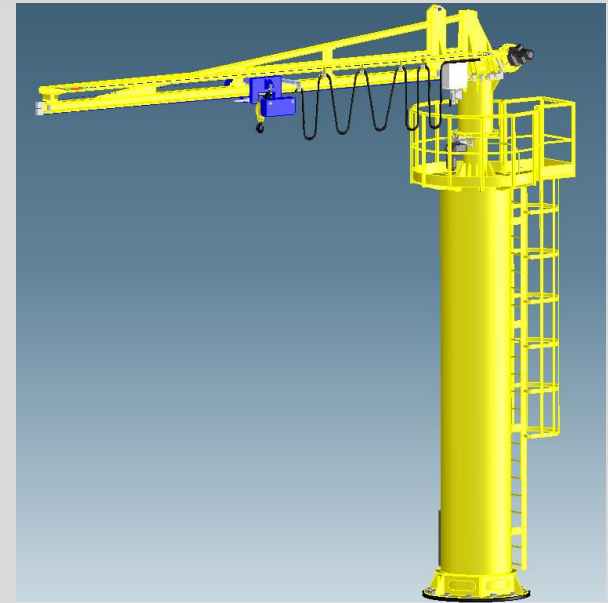
Electrical panels:

- power supply, control, distribution, explosion-proof (Ex).

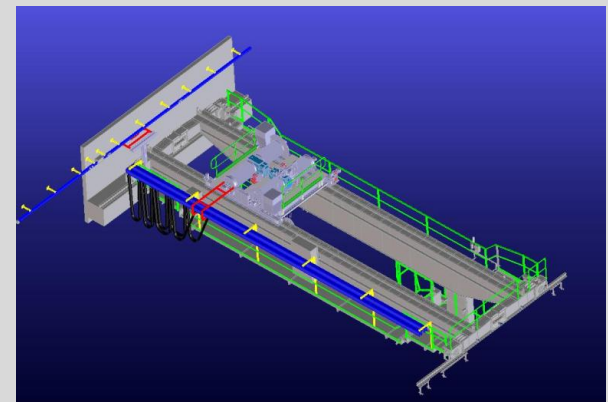
Power supply and control of moving parts:

- festoon supply (with flexible cables).
- cable rolls supply (with rotation pantographs).
- trolley supply (with linear pantographs).

Safety circuits



3D model of jib crane



3D model of bridge crane

Lifting transport equipment

ELEVATORS

Drive units:

- classical drive control with 2-speed motors.
- smooth drive control with frequency invertors.
- hydraulic drive control.

Control:

- automated control with PLC and visualization displays.
- remote monitoring and SMS alarm.

Safety circuits:

- load weight control.
- overspeed governor control.
- control of the bearing ropes: monitoring and detection of loosed / interrupted rope.
- control for unintended car movements (abnormal cabin status) with safety lock system.
- alarm and control voice duplex connection with service person and centralized information system.

Access control

Video surveillance

Service and maintenance.



Passengers elevator cabin

Lifting transport equipment

HOIST AND DRIVE COMPONENTS

- “Partners Engineering” Ltd is sales agent of **Stroina Transmissions d.o.o – Slovenia**: gear motors, gear boxes and transmissions

Electrical drives:

- Drive units sets:
 - * gear motors.
 - * motors – DC / AC (1- and 2-speed); 0.18 – 500kW.
 - * starters – star / triangle contactors, soft-starters, frequency invertors.
- Specialized drive control with frequency invertors with Flux vector control and Torque proving function, for light and heavy duty conditions.

Load-holding devices:

- clippers, traverses, grapples.
- equipment for manipulation of rolls, rolled metal, pipes, etc.

Winches

- Hoist lifting winches with carrying capacity 1 -- 500t.
- Drag horizontal winches with power 0.12 -- 120kW.

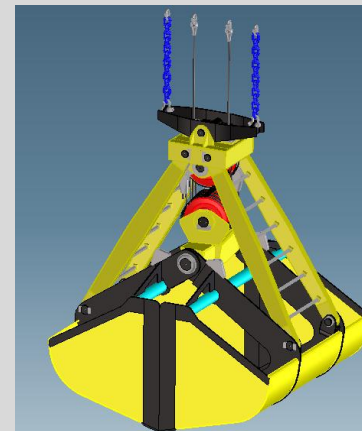
Crane trolleys with carrying capacity up to 500t.

Drive units and mechanisms:

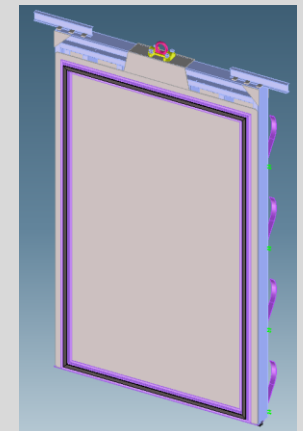
- leading (driving) and for free movements.
- for horizontal and rotational movements.
- for cranes, crane trolleys, etc.



Hoist mechanism of 200/32/5 tone crane



3D model of grapple grab



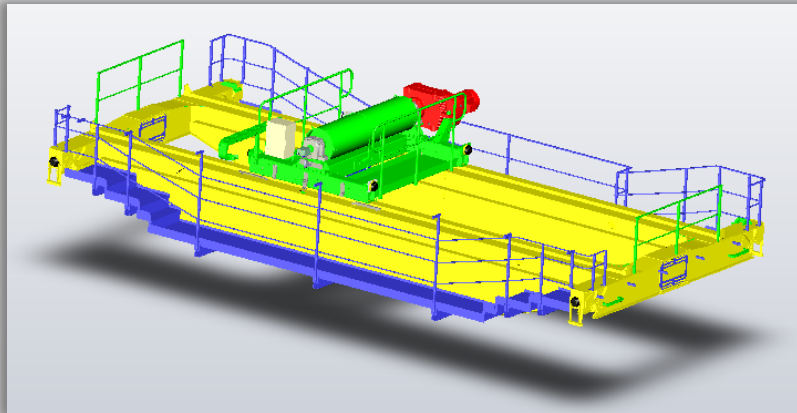
3D model of floodgate

Lifting transport equipment

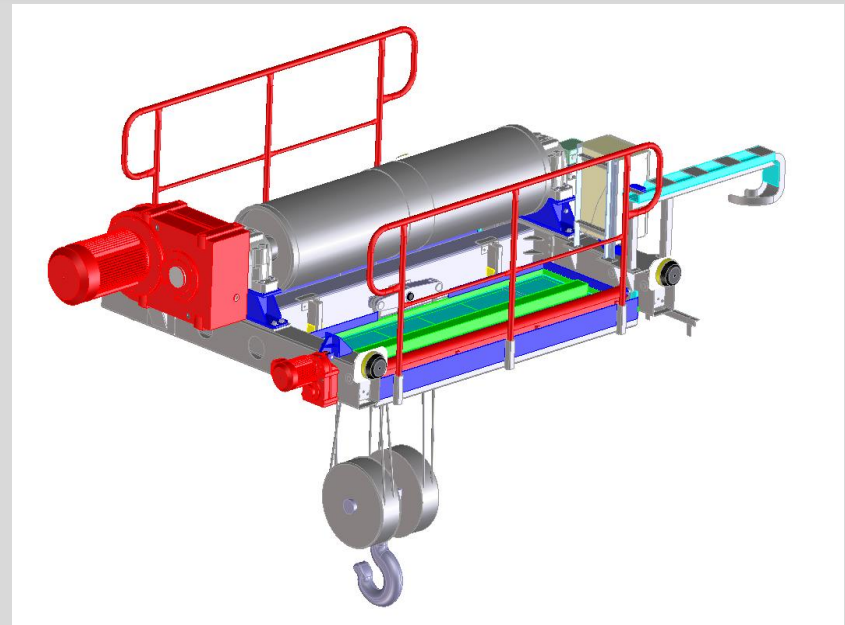
References:

- **“Kozloduy” NPP**
 - * Design, construction, reconstruction and modernization, assembly of:
 - Bridge, gantry and jib cranes, with load-capacity $Q= 1...200t$.
 - Crane trolleys and trolley power supplies.
 - * Implementing of SW and SCADA.
 - * Investigation of actual condition and aging determination of equipment.
- **State Enterprises „Radioactive wastes”**
 - * Construction of crane $Q=5t$ for hot cells.
- **“Maritza Iztok 2” TPP**
 - * Reconstruction of bridge and gantry cranes, with load-capacity $Q= 5...32t$.
 - * Reconstruction of passenger-freight elevators.
- **“ Maritza-Iztok “ mines**
 - * Technical condition analysis and aging assessment of lifting devices.
- **National Electric Company , Dams and cascades**
- **“Stomana Industry” Jsc**
- **“Bunay” Jsc**
- **„Assarel Medet” Jsc**

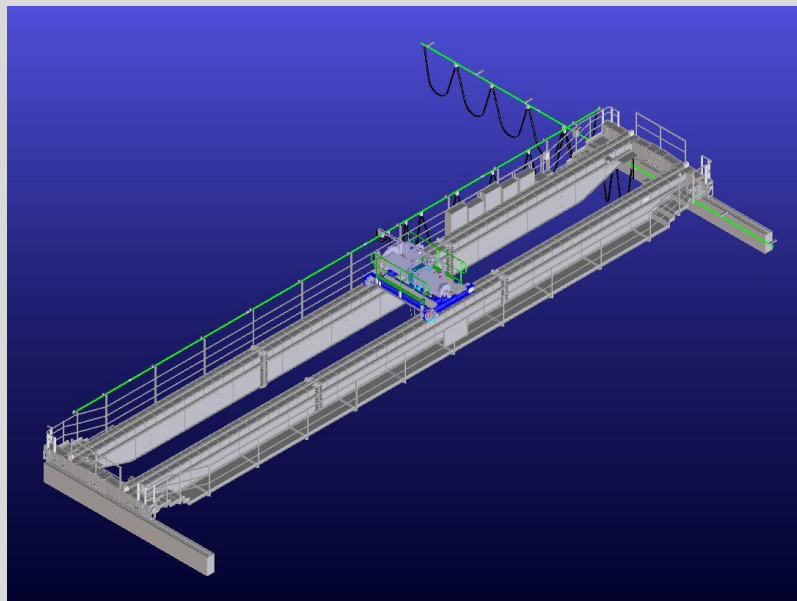
Lifting transport equipment



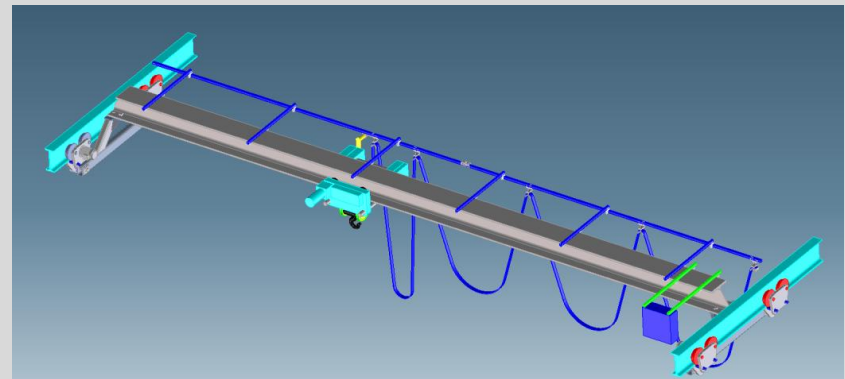
3D model of crane Q=20t



3D model of crane Q=20t – crane trolley

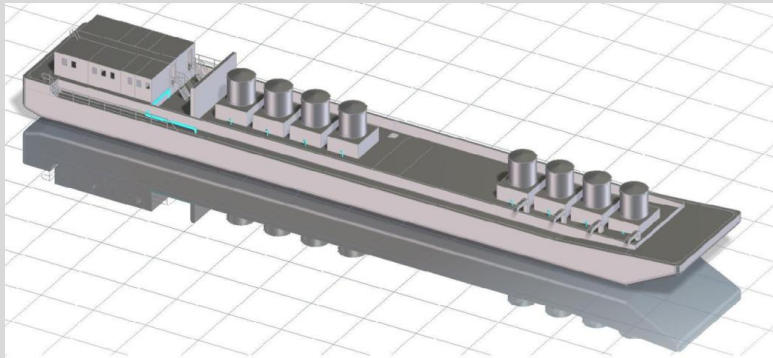


3D model of crane Q=16t

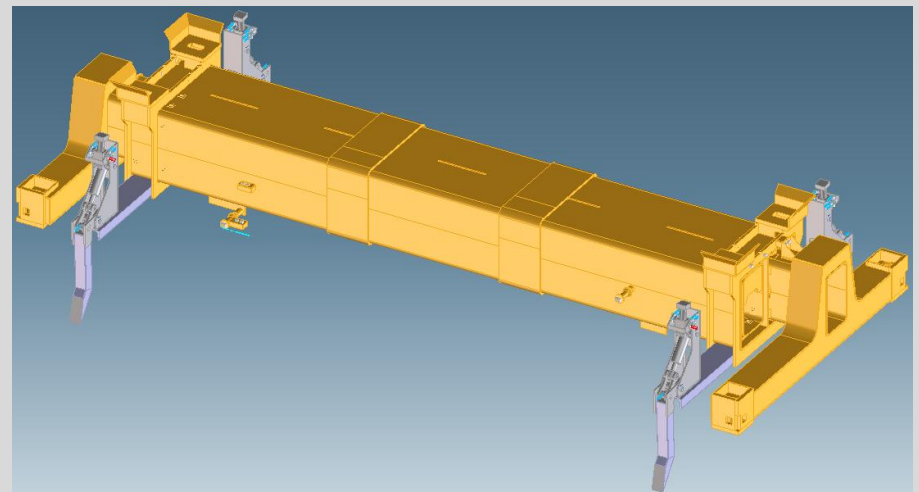
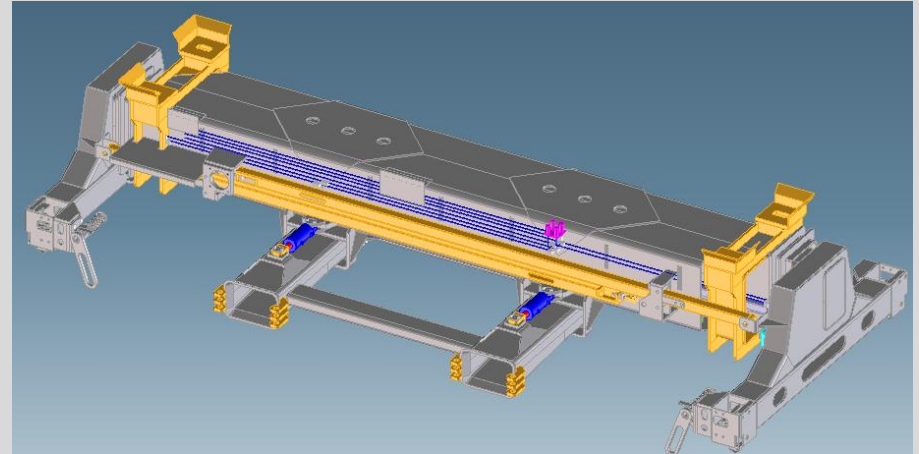


3D model of hoists crane

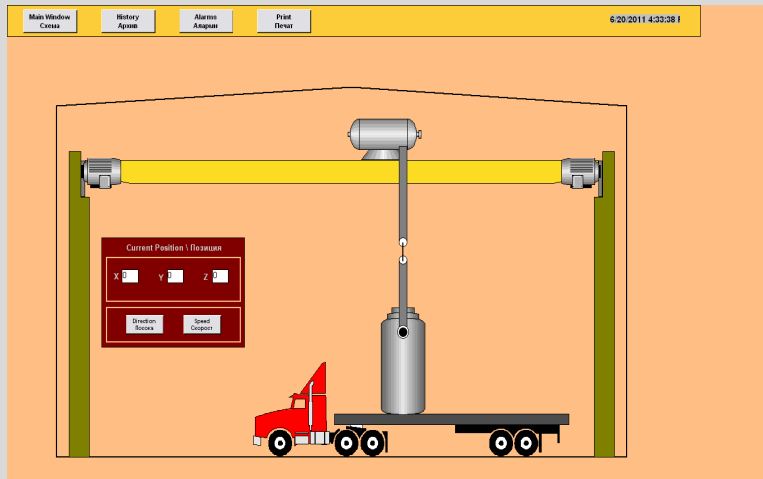
Lifting transport equipment



3D model of barge "Nautilus"



3D models of hydraulic telescopic spreader for 20-40ft containers, for crane / forklift



SCADA screenshot of 145 tone crane

Lifting transport equipment



Cabin and control unit of Q=200/32/5t crane



Festoon power supply of bridge crane



Brake resistors of frequency inverter

Lifting transport equipment



Electrical panels for crane with relay – contactors control and with frequency invertors in network communication with PLC.

Renewable energy sources

“Partners Engineering” Ltd
performs activity and have
experience in:

- Photovoltaic energy
- Hydro energy
- Wind energy
- Geothermal energy
- Energy from biomass

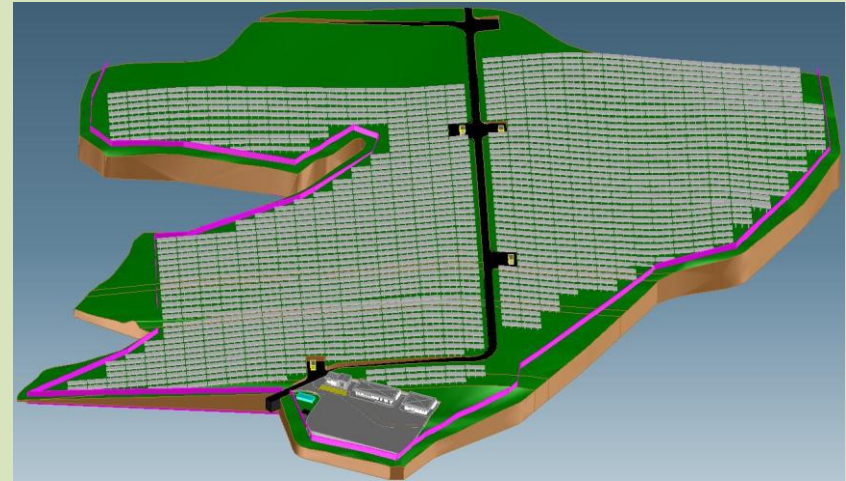


Renewable energy sources

“Partners Engineering” Ltd

offers the following services:

- Feasibility studies.
- Investment analysis.
- Industrial design in all phases - conceptual, technical, detailed and installation design.
- Equipment supply, construction activities, functional testing and commissioning
- Design approval by the corresponding authorities.
- Obtaining of permissions.
- Contracts with institutions.



3D model of photovoltaic power plant



Biodiesel installation facility

Renewable energy sources

References:

Photovoltaic energy:

- **Societe Industrielle de L'Atlantique – “Srem” photovoltaic power plant**
 - Detailed design of construction and installation.
- **”Dolni Dabnik” photovoltaic power plant 100kW**
 - Elaboration of detailed design, delivery of equipment, construction and installation works, functional testing and commissioning .
- **”Rupite” photovoltaic power plant 420kW**
 - Elaboration of conceptual design.

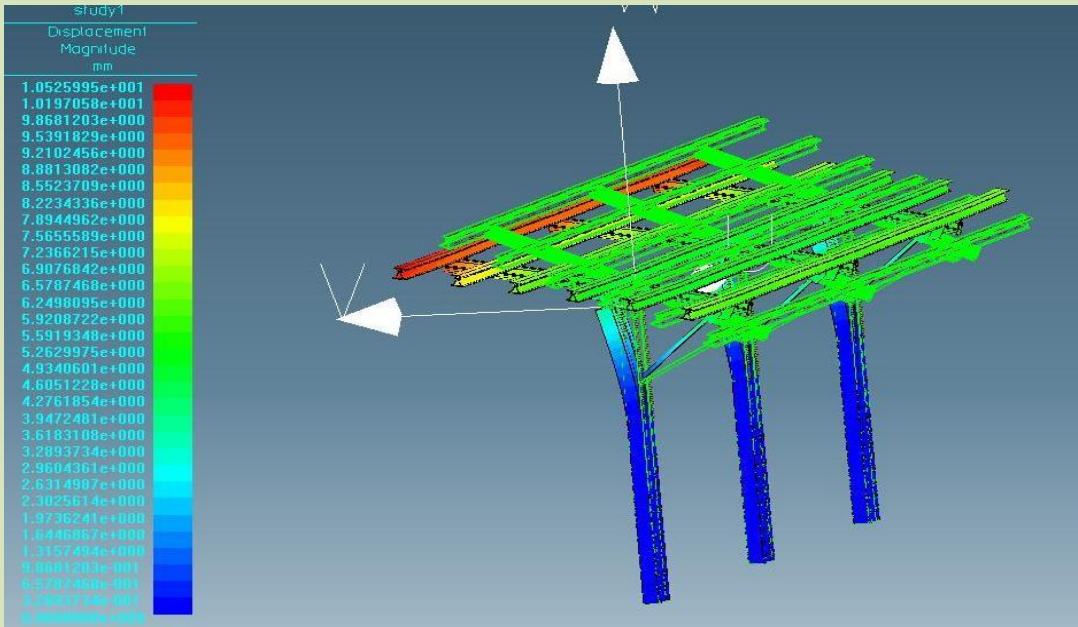
Hydro energy:

- **”Aquavak” Ltd - ”Garvanitsa” hydro power plant**
 - Elaboration of technical and constructive documentation, manufacture, delivery, construction and installation works of the water filter “Coanda”.
- **”Ivaylovgrad” hydro power plant**
 - Repair of First hydro-group of the water turbine.
- **”Parvomaici” hydro power plant**
 - Feasibility study, hydrological report for the water source, conceptual design.

Energy from biomass:

- **”Slanchevi Lachi Bulgaria” Ltd**
 - Biodiesel installation facility – detailed design of automated control systems.

Renewable energy sources



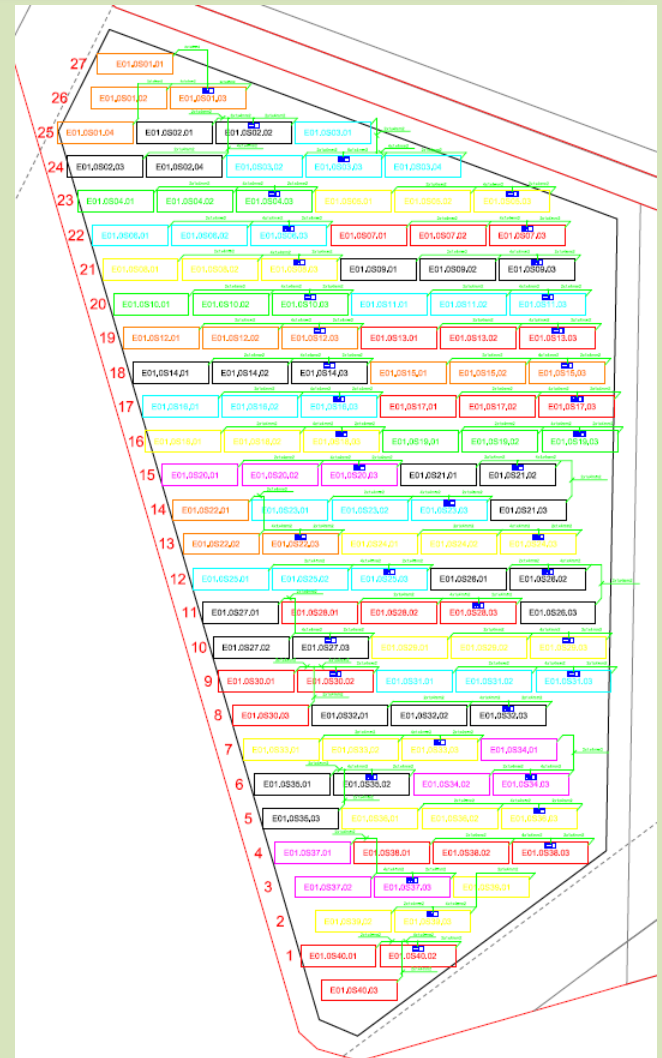
3D model of structures for photovoltaic panels



Photovoltaic panels

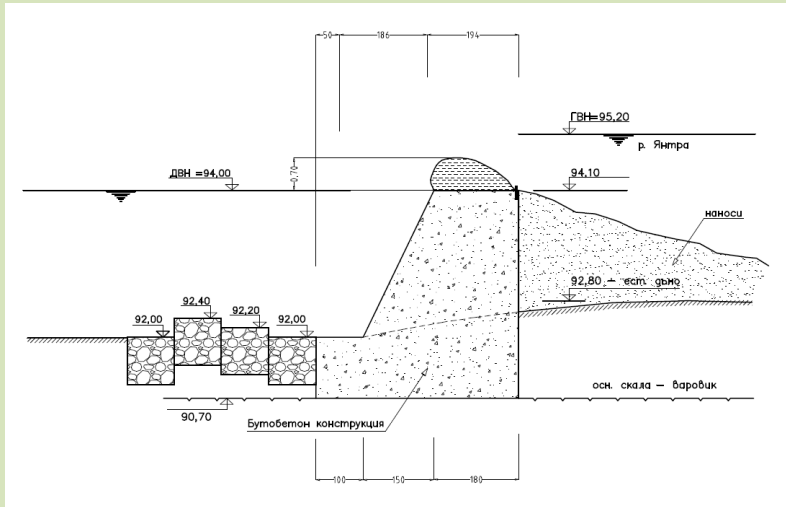


Photovoltaic power plant substation 110kV

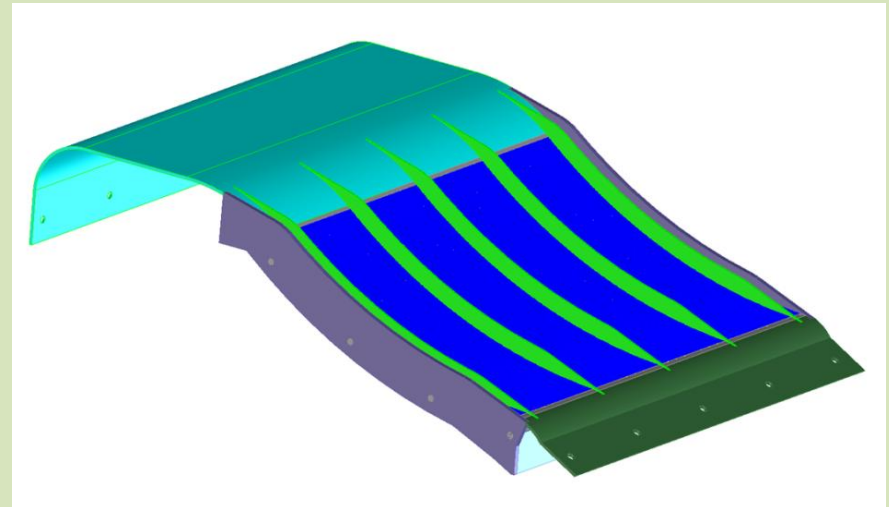


Photovoltaic power plant situation

Renewable energy sources



Hydro group of water turbine

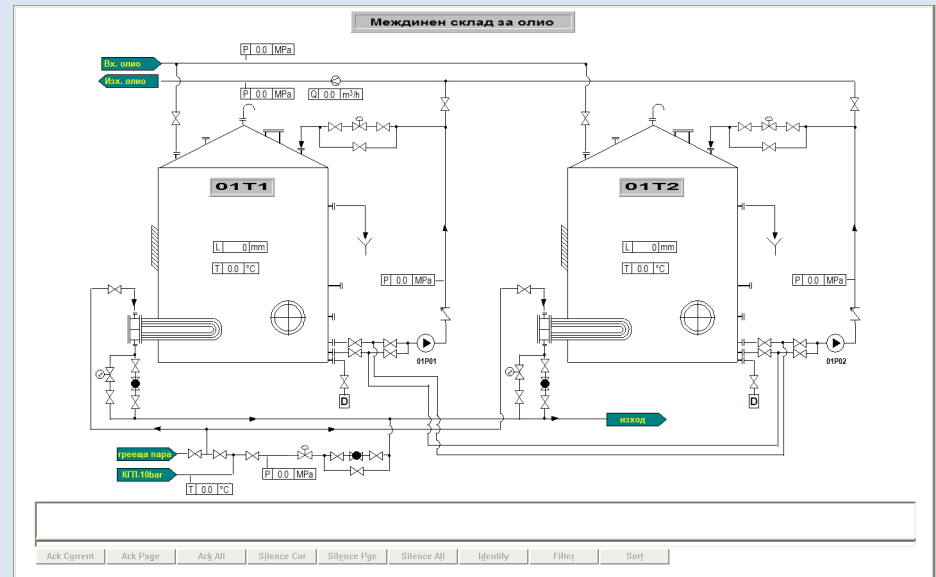


3D model of weir of hydro power plant

Automated control systems

“Partners Engineering” Ltd designs and installs automated control systems:

- **Partners Engineering Ltd** is RcSI recognized system integrator of **Rockwell Automation Inc**
- Automated systems for process optimizations in storehouses (for bulk cargo, parcels and packages).
- Instrumentation and automation.
- Industrial data acquisition and visualization systems.
- Hydraulics and pneumatics.
- Security systems and CCTV.
- Fire alarm systems.



Automated control systems

Engineering

- Analysis.
- Aging determination.
- Expert evaluation.
- Feasibility studies.
- Planning and design.
- Construction.
- SCADA – management system.
- Functional testing and commissioning.
- Maintenance.

Commercial activities

- Delivery of gear motors, gear boxes and transmissions - products of Stroina Transmissions d.o.o - Slovenia
- Purchase and delivery of modules, equipment and components of optional equipment.
- Consultations and expert technical assistance.

Assembly activities:

- Development of Rockwell Automation Inc products – Partners Engineering Ltd is RcSI recognized system integrator
- Development of control based on the industrial controllers of Siemens, Schneider Electric.
- Construction and installation of Industrial data acquisition and visualization systems.
- Hot standby redundancy control.

Automated control systems

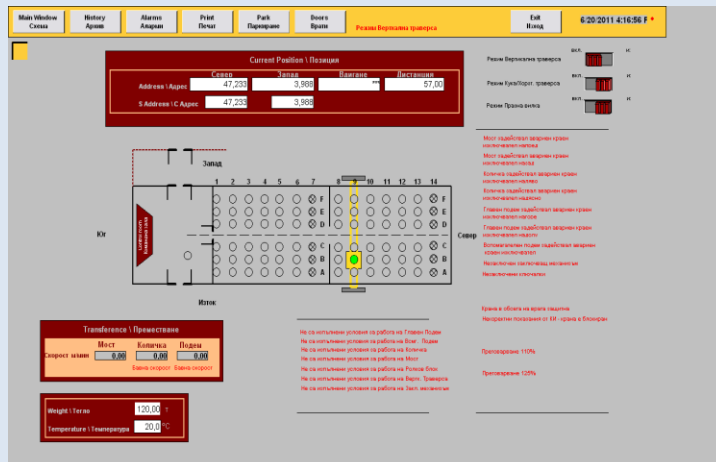
References:

- **„Kozloduy” NPP**
 - * Design of video surveillance system of technological processes in radioactive waste storage – Philips.
 - * Diesel generators reliability increasing in units 5 and 6 – Framatome.
 - * Fire alarm system technical and detailed design – Siemens.
 - * Engineering project for reloading machine of spent nuclear fuel.
 - * PHARE program project “Instrumentation, automation and electrical safety related prototypes equipment testing”
 - * Safety parameters indication system – installation design.
 - * Participation in elaboration of technical documentation for safety related control systems.
 - * Modernization (design, delivery and installation) of a new measuring system for monitoring parameters of the container barge "Nautilus“.
 - * Design and setup of a system for Periodical Automatic Gas Control in Units 5 and 6 (part of central measurement system for radiation control-01).
 - * Safeguard system in spent nuclear storage (ion fork detector and underwater camera).
- **State Enterprise „Radioactive wastes”**
 - * Participation in elaboration of technical design of radioactive waste combustion installation.
- **„Slanchevi Lachi Bulgaria“ Ltd**
 - * Biodiesel installation facility – detailed design of automated control systems
- **„Lyulin” motorway**
 - * Installation of CCTV, fire alarm system and gas analysis in the three tunnels.

Automated control systems



Visualization system of biodiesel facility



SCADA screenshot of 145 tone crane

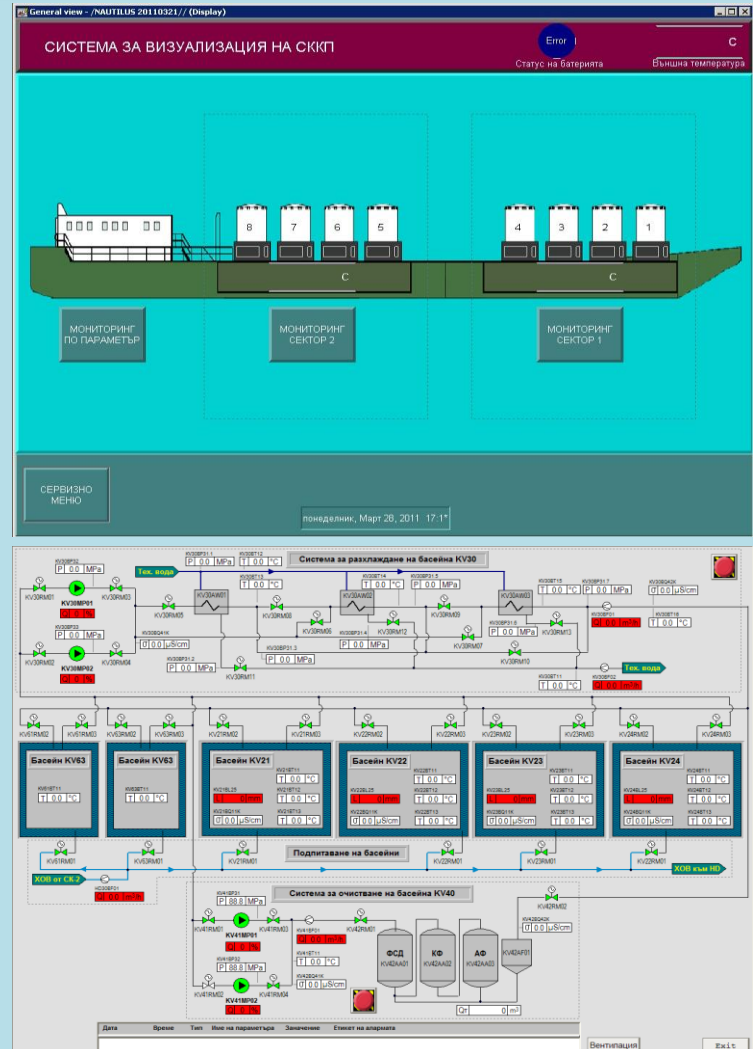


Electrical panel for control with PLC and display.

Software development

“Partners Engineering” Ltd develops:

- Software for control, visualization and positioning of lifting transport equipment.
- Software for control and visualization of safety control systems.
- Software for information and control systems.
- Software for continuous transport process.



General view of a displays of the SCADA system

Software development

Референции:

- **„Kozloduy” NPP**
 - * Modernization (design, delivery and installation) of a new measuring system for monitoring parameters of the container barge "Nautilus“.
 - * Design and setup of a system for Periodical Automatic Gas Control in Units 5 and 6.
 - * Engineering project for reconstruction of interlock and protection system in SFS.
- **„Slanchevi Lachi Bulgaria” Ltd**
 - * Development of the user interface software for the I&C system

Electrical equipment and installations

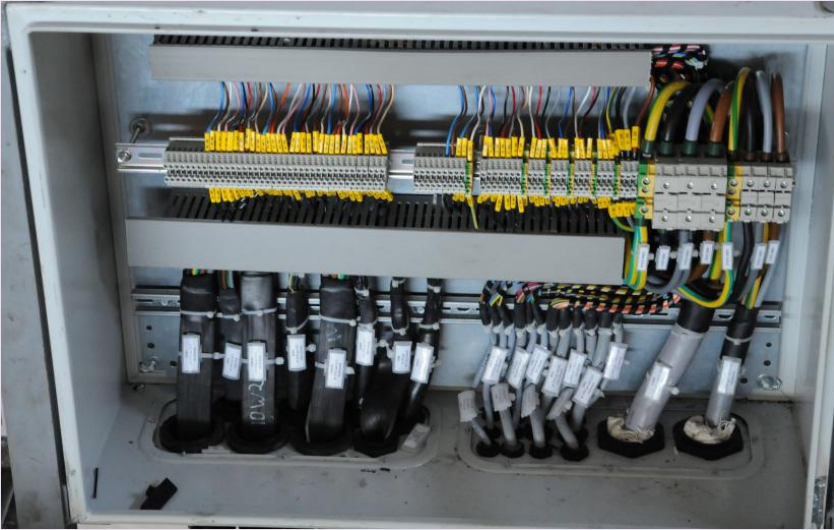
“Partners Engineering” Ltd performs complete engineering in the field of electro construction:

- Delivery and assembly of Complete transformer substations middle and low voltage.
- Construction of underground and air middle and low voltage cable lines.
- Manufacture, delivery and assembly of all kinds of equipment for temporary electric supply.
- Manufacture, equipment and assembly of electrometers, floor and special distribution panels, Ex panels.
- Construction of electrical and data information installations.
- Implementing of frequency invertors and softstarters:
 - Specialized frequency invertors with Flux vector control and Torque proving function, for heavy duty conditions.
 - Frequency invertors up to 10kV, 25MW.
- Delivery and installation of cables, insulators and equipment.
- Mounting of relay, distribution- and control panels.
- Assembly, adjustment and starting of relay protection.



Panel for hoist control with specialized frequency inverter for heavy duty conditions.

Electrical equipment and installations



Terminals connections in electrical panels

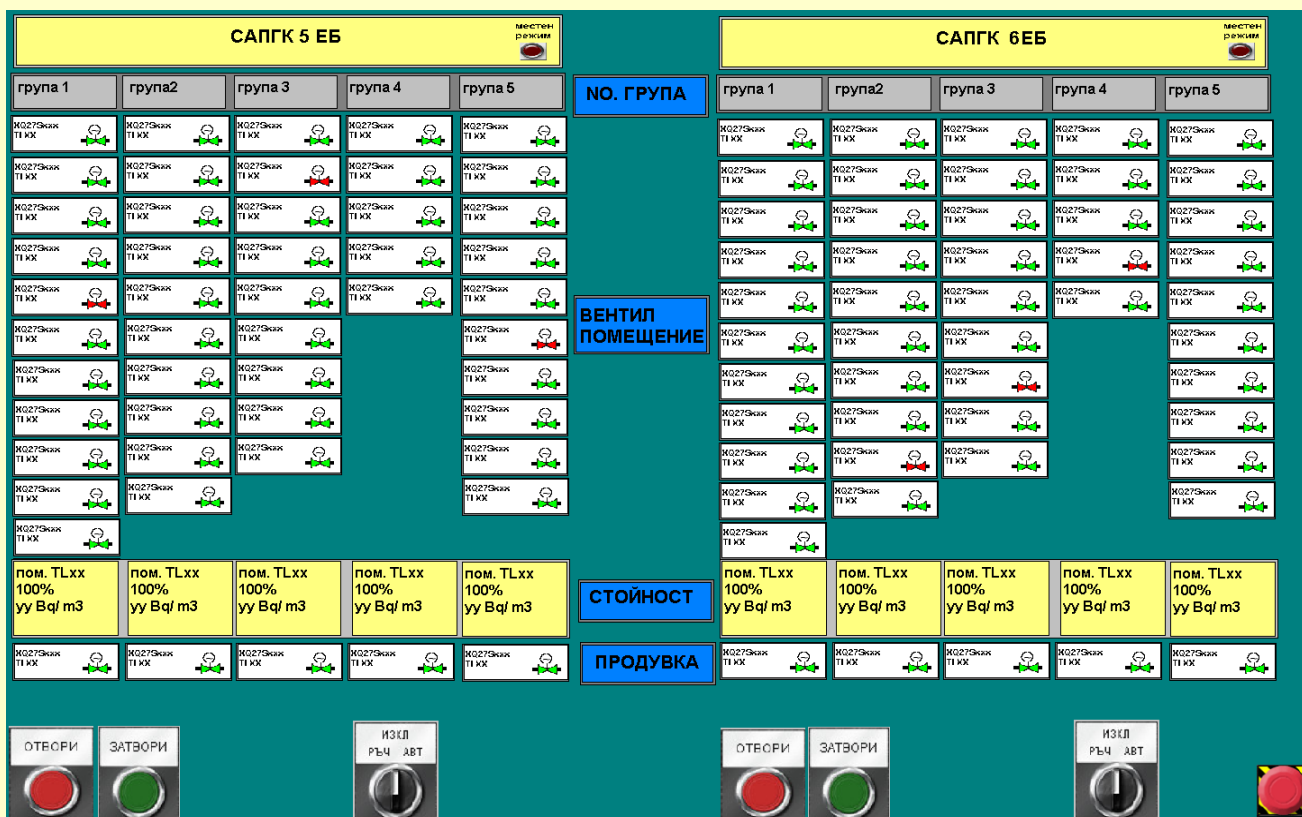


Electrical panels of crane Q=200/32/5t

Radiation and emission control

“Partners Engineering” Ltd

performs complete engineering, delivery and installation of radiation and emission control systems.



Main screen of the SCADA system for analysis of periodic automatic gas control

Radiation and emission control

References:

- **“Kozloduy” NPP**
 - * Detailed design for radiation control of radiation fault detection laboratory.
 - * Detailed design for radiation control system of Spent fuel storage.
 - * Design, delivery and installation of 10 aerosol detectors part of a system for Periodical Automatic Gas Control in Units 5 and 6.
- **State Enterprise “Radioactive wastes”**
 - * Participation in elaboration of technical design of radioactive waste combustion installation.
- **Nuclear research reactor IRT-2000**
 - * Preparation of „ Installation diagrams and bills of quantities” for project „Installation and commissioning of noble gases monitors NGM 204L, gamma radiation monitors GIM 204 and neutron flux monitors NIM 201”.
- **“Lyulin” motorway**
 - * System for control carbon monoxide in the tunnels, and the presence of toxic gases derived from burning of certain fuels.

Analysis, design and approval

“Partners Engineering” Ltd performs:

- **Preparation, analysis, design and approval by the corresponding authorities of all design phases:**
 - Architectural.
 - Construction-structural part.
 - Mechanical and technological part.
 - Electrical part.
 - Heating, ventilation and air conditioning.
 - Water Supply and Sewerage.
 - Communication and Information technologies.
 - Automated control and monitoring systems : Instrumentation and automation, hydraulics and pneumatics, security systems and CCTV, fire alarm system.
 - Radiation protection, radiation and dosimetry control.
 - Environmental monitoring systems.
- Aging determination of lifting equipment – portal bridge cranes, bridge cranes and elevators.
- Emergency scenarios - abnormal discharges of harmful emissions, floods, earthquakes, industrial accidents, weather.
- Measures for protection of personnel and population.
- Environmental expertise - air (dust emission); ash (irrigation, shading, reduce of the wind load, CO2 price reduction by building renewable energy sources); "high wave" and high water.
- Technical consultancy.

Analysis, design and approval

References:

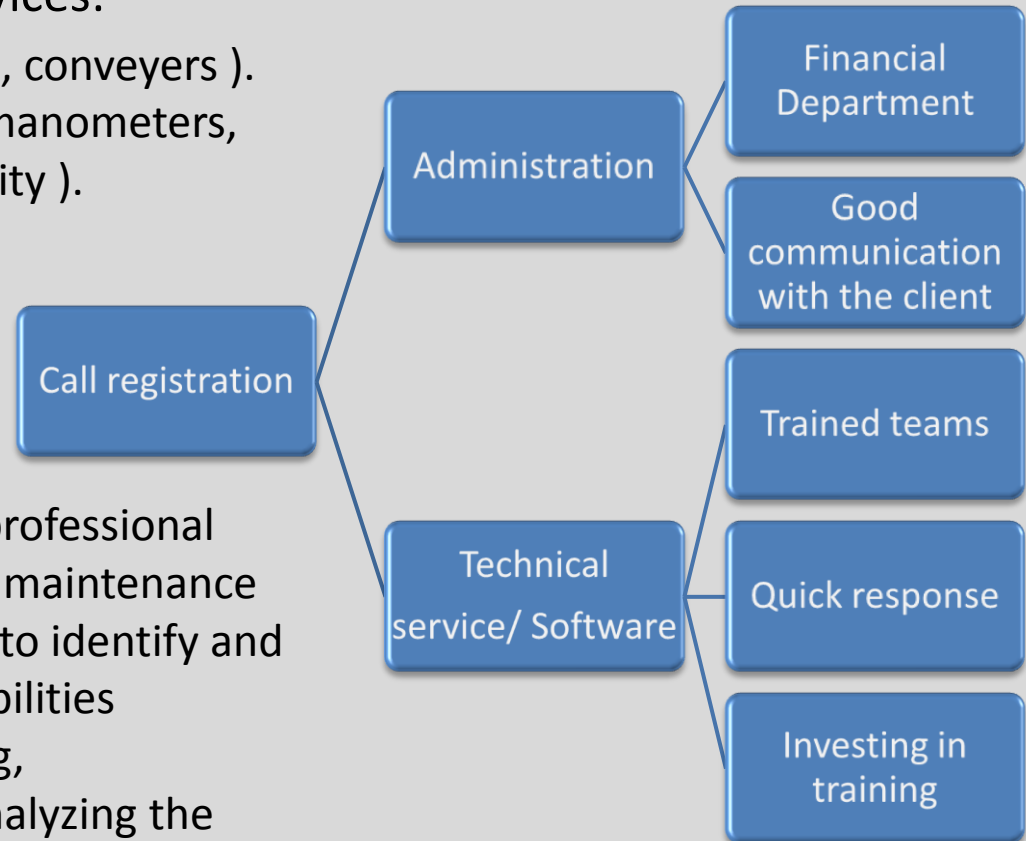
- **"Kozloduy" NPP**
 - * Elaboration of methodology for aging determination of electrical equipment in units 1,2,3 and 4 – Siemens.
 - * Elaboration of technological regulation for spent fuel storage.
 - * Safety analysis report of units 5 and 6, part – radiation control and radiation protection.
 - * Participation in elaboration of technical documentation for safety related control systems.
 - * Participation in development of aging determination of utilities for transport of spent nuclear fuel in storage facilities.
 - * Installation of assemblies 5,6HG, installation design – safety analysis report.
 - * Safety analysis report of switches.
- **"Belene" NPP**
 - * Participation in expert and consultancy group, responsible for technical design evolution.
- **Nuclear research reactor IRT-2000**
 - * Safety analysis report of the detailed plan for partial dismantling of the research reactor.
- **"ONET Technologies Bulgaria" Ltd**
 - * Licensing and construction project for National radioactive waste repository in Saligny, Romania, technical design and tender documentation preparation
- **National Electrical Company , "Dams and Cascades"**
 - * Expertise and technical evaluation of elevators.
- **"Aquavak" Ltd – "Garvanitsa" hydro power plant**
 - * Elaboration of technical and constructive documentation, manufacture, delivery, construction and installation works of the water filter "Coanda".

Subscription servicing and maintenance

“Partners Engineering” Ltd services:

- Lifting equipment (cranes, elevators, conveyers).
- Instrumentation and automation - manometers, thermometers, level systems (security).
- Monitoring – emission.
- Photovoltaic power plants.
- Information system for management of maintenance and repair of equipment (CMMS).

The system provide information to professional and managerial staff involved in the maintenance and repair. The program purpose is to identify and regulate the activities and responsibilities associated with planning, organizing, implementing, documenting and analyzing the activities of maintenance and repair of facilities (including the control condition).



“Partners Engineering” Ltd offers more:

-
- I. **Automation of new industrial systems (machines) and modernization of existing ones based on the following PLC:**
 1. Rockwell Automation
ControlLogix (including hot standby redundancy systems) , FlexLogix, SLC500, S5
 2. Siemens
S7-400, S7-300, S7-200
 3. Schneider Electric
using industrial networks: Ethernet/IP, ControlNet , DeviceNet, DH+, Remote IO, Profibus, Profibus – DP, MPI, Modbus, RS485
and: DeviceNet, Profibus, Modbus, RS485.
 - II. **Implementing and modernization with frequency invertors and softstarters:**
 - Specialized frequency invertors with Flux vector control and Torque proving function for heavy duty conditions.
 - Frequency invertors for middle voltage up to 10kV, 25MW.
 - III. **Building management system – complete engineering:**
 - Analysis, aging determination and expert evaluation.
 - Integration of existing specific applications into Management system.
 - Visualization of data from specific SW / HW.
 - Archivation of data from specific SW / HW.
 - Development of SW transmitters, convertors and transact managers in real time (OPC).
 - IV. **Full engineering of non-standart equipment.**