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General Profile

START ENGINEERING JS Co. is a leading private company, specialized in the field of: adjustment, start up and commissioning of electrical installations and tuning up, start up and adjustment of I&C facilities, and Systems for automated control of technological equipment.

The company's activities include projects in the Middle East, Africa, Central Europe and in countries of the former USSR.

In the field of power industry our specialists have been participating in the implementation and commissioning of almost all small and big power sites - factory power plants, smaller and bigger heating plants in the towns, in the big power units in the thermal power plants in Varna, Bobov Dol, the power complex Maritza East, in the erection of every one of the power units of Kozlodoui Nuclear Power Plant, as well as in the Water Power Plants (including the Chaira Pump-Storage Water Power Plant).

Activities
In the recent decade "Start engineering" JS Co. gained great experience in implementing Information and Control Microprocessor Systems in Thermal Power Plants and Water Power Plants as complete engineering activities, including:

- design;
- delivery of equipment;
- installation;
- quality assessments;
- preparation of technical designs;
- adaptation of existing software programs for process control;
- optimization of control systems;
- complex tests;
- warranty period maintenance and services;
- training of personnel;
- adjustment and commissioning of computerized control and information systems;
- delivery and installation of computer systems and computer networks;
- development of object oriented and application software;
- monitoring and diagnostics;
- assessments of the technical requirements regarding power supply equipment;
- functionality of Information and Control Microprocessor Systems in relation to the project;
- starting up and adjustment of all system functions. Nine of all seventeen 210 MW block-turbine units in Bulgaria are automated by START ENGINEERING JS Co. On all of these sites START ENGINEERING JS Co together with other organizations develops and can apply and test new advanced methods and algorithms concerned with control and solving technological problems:
  - combustion;
  - fuel air rates;
  - temperature control and diagnostic of the equipment;
  - decreasing of the environment pollution.

Portfolio
The specialists of START ENGINEERING JS Co. participation in the modernization of the production capacities of all branches of the industry.

During the recent years the company has been working on projects like:

- *Food industry* - Carlsberg Bulgaria JSC: "Shumensko pivo" brewery
- *The power industry* - in "Maritza East 2 TPP, in Maritza East 3 TPP, "Bobov dol" TPP, "Varna" TPP, "Rousse" TPP, "Kozloduy" TPP, "Chaira" PSWPP, and electrical distribution substations at 400 kV, 220 kV, 110 kV
- *The heating industry* - "Sofia" TPP, "Lyulin" HP, "Zemlyane" HP, Sofia East TPP
- *The metallurgical industry* - "Kremikovtzi" MC, "Stomana" - Pernik, UMICORE - Pirdop, OCK "Kardjali"
- *Chemical industry* - "Nephtochim" - Burgas, "Himko" - Vratza, "Agrochim" - Stara Zagora
- *Gas compressor stations* - "Ihtiman", "Petrich" and "Lozenetz", Gas filling plant of "Shell gas Bulgaria", Gas filling plant of "Opet Aygas Bulgaria"
- *Cement industry*
- *"Metropoliten" - Sofia*
- *Ecology* - purification facilities
- "Beli Iskar" Dam, “Yadenitza” Dam

Projects in Bulgaria

1989 - 1991

- Starting up and commissioning of control loops in the Information and Control Microprocessor System with TDC 3000 (HONEYWELL) in TPP of "Himko" - Vratza (three boilers with capacity of 160 t/h steam).

- Starting up and commissioning of control loops, remote control and part of the information functions of the Information and Control Microprocessor System of power unit 1 of "Varna" TPP with capacity of 210 MW (AUDATEK system of the former DDR).

- Starting up and commissioning of the Information and Control Microprocessor System of power unit 7 of "Maritza east 2" TPP include about 350 input-output signals. The systems for automated control of the capacity of the power unit, the fuel, gas and air flow of the boiler and the temperature of the primary and secondary steam are included in this number.

- Design, delivery of equipment, installation and adjustment of Information and Control Microprocessor System of power unit 6 of "Maritza East 2" TPP with capacity of 210 MW. The system was commissioned in the period 1989 - 1990 with a range of about 120 input-output signals. An extension was made in 1993. At the moment the system encompasses all control loops of the technical parameters of the boilers, turbine and common plant installations with a final number of about 1400 input-output signals.

- Commissioning and adjustment of the Information and Control Microprocessor System of power units with a capacity of 210 MW of "Maritza East 2" TPP began at different stages in 1991. At first, Information and Control Microprocessor Systems of units 1 and 2 were adjusted. The systems of units 3 and 4 were adjusted at later stages. The systems have a capacity of about 700 - 800 input-output signals. The above mentioned Information and Control Microprocessor Systems are integrated and workplaces are provided for Production and Technological Division, on duty engineer, Manager of TPP and Chief Engineer. Along with this, an integration of our system with the ALTIVAR system of TELEMECANIQUE company was realized, for frequency control of belt conveyors.

1992 - 1997

- In the period 1990 - 1995 START ENGINEERING JS Co. performed supervizing installation, starting-up and commissioning of gas compressor stations - "Ihtiman", "Petrich" and "Lozenetz" with a total of 10 comperssor units (each of them having a 6.3 MW gas turbine engine) and relevant systems for preparation and cleaning of natural gas, gas signalling, fire alarm and fire fighting systems.

- As a main contractor of starting up and commissioning works on blast furnace 3 of "Kremikovtzi" AD in the period 1993 - 1994, "Start engineering" JS Co. designed and introduced Information and Control Microprocessor Systems for furnace control with about 140 input-output signals, 5 control loops on the basis of TELEPERM AS235K of SIEMENS company, as well as of a double redundant microprocessor system for controlling the mechanisms for loading the furnace, performing extremely complicated algorithms on the basis of programmable controllers SIMATIC S5-115H with about 250 input-output signals, also of SIEMENS company. Both systems are operating normally and have very good technical characteristics.
  START ENGINEERING JS Co. provided complete engineering of both systems - production of panels and cabinets, design, training of personnel, installation, adjustment and starting up.

- In 1995, the company won the open international tender for design, delivery of equipment, installation and adjustment of Information and Control Microprocessor Systems and I&C of power unit 8 of "Maritza east 2" TPP with a capacity of 210 MW. The system includes all loops for control of the technical parameters of the power unit with a final number of about 2000 input-output signals.
  The above mentioned Information and Control Microprocessor Systems are integrated and workplaces are provided for Production and Technological Division, on duty engineer, Manager of TPP and Chief Engineer, Shift Foreman, Boiler operator. Along with this, integration with the introduced in 1990 Information and Control Microprocessor System TELEPERM of the SIEMENS company, controlling unit 5 was made.

- Introducing and adjustment of DCS of unit 5 in'Maritza East 2'TPP was made in 1995. The unit consists of two direct current boilers and a turbine with a 150 MW generator. The systems have a capacity of about 800 input-output signals and consist of 40 control loops.

- Introducing and adjustment of DCS of unit 4 in "Maritza east 2" TPP was made in 1996. The systems have a capacity of about 800 input-output signals and consist of 35 control loops.

- An Information and Control Microprocessor System of boiler 3 of 'Bobov dol' TPP with a capacity of 210 MW was introduced in 1995 - 1996. The systems have a capacity of 820 input-output signals and consist of 23 control loops. A model predicting control of the burning system and of the power of the boiler-turbine unit was introduced in 1997.

- A DCS system was adjusted for unit 2 of 'Maritza East 2'TPP TPP in 1997. The system has a capacity of 350 input-output signals and consists of 10 control loops.

- A DCS for continuous reheating furnace 1 in Kremikovtzi JS Co was implemented and commissioned in 1996. The system has a capacity of 128 I/O signals and consists of 12 control loops.

- Participation in 1996 in the commissioning of the microprocessor systems from the company HONEYWELL in Devnya TPP.

- In the period between 1995 - 1996 START ENGINEERING JS Co designed, erected and commissioned electrical, I&C and PCS equipment for water heating units 4 and 6 in Sofia TPP for central heating. The system has a capacity of 80 I/O signals and consists of one control loop for each unit.

- Commissioning of an information network of controllers in Sofia TPP in the period between 1996 and 1997. development of an information system for control and optimization of the technological regimes (SCOTR) was. It encompasses steam generators 7, 8 and 9, turbine generators 6 and 8, water heating units 4 and 6. The system has 280 input signals. SCOTR gathers the signals necessary for calculation of the efficiency factor, of the technical and economic parameters, makes the optimization procedures to find the most effective working levels of the TPP components included in the system. All these functions of SCOTR are provided with a very good visualization.

- In the period between 1996 and 1997 the company made design and commissioning of systems for dosage and control of mechanisms of electrical furnace in Metallurgical Complex Stomana Pernik. The systems are based on SIMATIC S5-135U and comprehend 500 I/O signals.

- Our company implemented a system for control of softening filters in "New water treatment plant" in Ljulin Heating Plant, based on PLC SIMATIC S7-300 in 1997.

- In the period between 1996 - 1997 START ENGINEERING JS Co designed, erected and commissioned electrical, I&C and PCS equipment for masout pump-storage station in Zemlyane Heat Power Plant. The system has a capacity of 128 I/O signals and 7 control loops.

- In 1997, specialists of START ENGINEERING JS Co participated in the introducing and adjustment of Advant OCS control system of ABB company on 4 units and outdoors switchgear of "Peshtera" WPP

  For the needs of the above mentioned activities START ENGINEERING JS Co has an additional division for producing of cabinets, boards and auxiliary devices (temperature transmitters, isolated amplifiers, relay panels etc.)

1998 - 2002

- Design of I&C and Electrical equipment, starting up and adjustment of Information and Control Microprocessor System at the boiler of unit 5 of "Kremikovtzi" TPP was performed in 1998. The systems have a capacity of 248 input-output signals and contain 8 control loops.

- In 1998, the company performed design of I&C and Electrical equipment, starting up and adjustment of TELEPERM XP system for control of unit 6 - complete engineering of the SIEMENS company. The systems have a capacity of 300 input-output signals and contain 24 control loops.

- Design of I&C and Electrical equipment, introducing and adjustment of Information and Control Microprocessor System MIC 4000 at unit 5 of "Kremikovtzi" TPP was performed in 1998. The systems have a capacity of 250 input-output signals and contain 10 control loops.

- In 1998 Start Engineering JS Co. performed design, installation and adjustment of Electrical, I&C and PCS equipment for water heating units 1, 2, 3 and 5, steam generators 4, 5 and 6, turbines 4 and 5 in Sofia TPP. The system has a capacity of 150 input-output signals. These new controllers were added to the existing information system for control and optimization of technological levels.

- In the end of 1998 specialists of START ENGINEERING completed the commissioning works of the main devices of 210 MW Units 3 and 4 at the newly built Chaira Pumped and Storage HPP - Bulgaria. The scope of the works included Main Transformers; Excitation Systems; Generator and Line Protections; Generator and Switchyard High Voltage Devices; Unit auxiliaries; Control system (TOSHIBA TOSMAP - GS800 Series controllers).

- Performance of a system for calculation of efficiency and other technical and economic parameters for unit 3 of Bobov dol TPP.

- In the beginning of 1999 specialists of START ENGINEERING JS Co. performed design, installation and commissioning of a microprocessor system on the basis of SIMATIC S7-300 for control of process facilities, treating propane-butane and emergency facilities for fire fighting and degassing in the newly built Gas filling plant of "Shell gas" Bulgaria near Benkovski, Plovdiv district.

- Design, I&C, electrical equipment, supervision, adjustment of control loops by means of S7-400, visualization through WinCC was performed in "Kremikovtzi" Metallurgic Complex in 1999 with the participation of "Start engineering" JS Co.

- "Start engineering", JS Co. commissioned I&C and Electrical project, frequency motor control etc. in Lime plant - Puklina in 1999. The control system consists of four PLC S7-400 combined in a network. The visualization of the operator's stations is realized by means of InTouch 7.0 (Wanderware).

- In the period between 1999 - 2000 START ENGINEERING JS Co. performed fabrication and delivery of electric panels, installation works, adjustment and starting-up the process facilities and control loops during Rehabilitation of a smelting furnace with a fluidized bed and a waste-heat boiler in Union Miniere Pirdop Copper - Pirdop.

- In the year of 2000 the Gas filling plant of "Shell gas" Bulgaria near Benkovski, Plovdiv district goes through "Extension - stage 1", which entails control system updating. Redundancy of the CPU and the Operator's station is introduced.

- Design of I&C, of all loops with and without feedback and adjustment of units 1 and 2 of Bobov dol TPP with the system HONEYWELL TPS was performed in 2000. For the first time in Bulgaria the old manual control and panels of a 210 MW unit were dismantled. The entire process information is available in ten operator's stations (five on each unit). The system encompasses about 4000 input-output signals.

- Commissioning of 6 primary SIMADYN D turbine governors of SIEMENS at units 1 and 2 in Bobov dol TPP, units 5 and 6 in Varna TPP and units 6 and 8 in Maritza East 2 TPP was performed in 2002.

- Commissioning of TELEPERM XP at units 4 and 5 in Varna TPP was performed in 2000. The work included I&C, adjustment of loops with and without feedback and starting up.

- An extension of the TELEPERM XP system at unit 6 in Varna TPP was made in the summer of 2001, covering the regenerating system of the plant.

- Again, in 2001 a Modicon Control System of Schnieder was introduced of reheating furnace in Stomana Metallurgical plant in Pernik. The work included I&C, adjustment of loops with and without feedback and starting up.

- The sulphur-cleaning installation for units 7 and 8 in Maritza East 2 TPP was commissioned with the participation of "Start engineering", JS Co. in the period between 2000 and 2001.

- In the period between 2000 and 2001 START ENGINEERING JS Co. acts as main contractor for the electrical installation works and starting-up and commissioning works of "Dupnitza to Kulata Railway" Project.

- Again, in the period between 2000 and 2001 START ENGINEERING JS Co. performed design, installation and commissioning of a microprocessor system based on SIMATIC S7-300, SIMOCODE DP and PROFIBUS DP for controlling the Facilities, loading the convertor bunkers in UMICORE Pirdop.

- START ENGINEERING JS Co. has been participating as a subcontractor in the huge project for Rehabilitation and Upgrading of Waste Water Treatment Plant - Sofia since 2001, performing complete delivery of equipment, design, installation and starting-up and commissioning works.

- In 2001 START ENGINEERING JS Co. - branch Sofia acts as main contractor of the electrical installation works and I&C works, as well as the starting-up and commissioning works on "Industrial Pollution Improvement Project" at KCM - Plovdiv.

- In 2002 START ENGINEERING JS Co. - branch Sofia performed design, delivery, installation and commissioning of microprocessor system based on SIMATIC S7-300, SIMOCODE DP and PROFIBUS DP for controlling the facilities, transporting the waste material during the floatation of copper slag in the newly built fayalite tailings facility of UMICORE Pirdop.

- METROPOLITEN Sofia: START ENGINEERING JS Co. is main contractor of: electrical installation and starting-up and commissioning works at Metro stations No:1 through No:5; design of the automation systems of traction substations and lighting systems, pumping stations and ventilation, based on PLC with equipment of SIEMENS - SIMATIC S7 and SCHNIEDER - MODICON TSX for Metro stations No:6 and No:7; the design for control of lighting, pumping stations and ventilation systems of the extension of "Metropoliten" Sofia from Metro station No:7 to Metro station No:10;
  The electrical installation works and starting-up and commissioning works, design of PLC based systems of lighting and sanitary facilities, fabrication of electric panels for the Metro section from "Slivnitza" station to "Obelya" station.

- In the end of 2002 and the beginning of 2003 START ENGINEERING JS Co. - branch Sofia performed design (hardware and software), specification and delivery of equipment, installation and commissioning of the instrumentation system for "Beli Iskar" Dam.

2003 - 2007

- In 2004 START ENGINEERING JS Co. branch Sofia performed design, ordering, delivery, programming, installation and commissioning of Electroequipment, P&I equipment and SCADA for upgrading of Zinc plant in Lead & zinc complex Kardjali.
- In 2005 START ENGINEERING JS Co. branch Sofia performed design; specifying, order and delivery of part of the equipment; programming; installation and commissioning; training of the personnel for I. Extension of the systems for visualization and control in Fermentation department for 6 pcs. of new CCTs and II. Systems for visualization and control of new settling vessels – 4 pcs of BBTs and new system for CIP cleaning in Carlsberg Bulgaria JSC: „Shumensko Pivo" brewery.
- In the end of and the beginning of 2006 START ENGINEERING JS Co. branch Sofia performed additional design implementation, commissioning and staff training in terms of Control and monitoring system for: biotechnological process in 10 fermentation/ageing tanks CCT, 4 yeast tanks, 6 conditioning tanks BBT; technological cleaning process (CIP) by 2 equipmentcs – with 6 vessels and with 4 vessels in "Pirinsko pivo" Blagoevgrad of Carlsberg Bulgaria JSC

International Projects

- START ENGINEERING JS Co has been working successfully in the Russian market as well. There are two implementations of DCS (1995, 1996) in MOSENERGO Moscow. We are currently preparing several offers for automation of power plants in Russia.

- One of our specialists, in cooperation with ABB, participated in the commissioning, adjustment and testing of Advant OCS system on four hydro turbines, indoors switchgear and auxiliaries of "Guigang" Hydro Power Plant in 1999 in China.

- Specialists of START ENGINEERING JS Co. have participated in DYCOMANS (Dynamic Control and Management Systems in Manufacturing Processes)
- The company has participated in workshops in Prague (Czech Republic), Algarve (Portugal), Varna (Bulgaria), Zakopane (Poland), Patras (Greece) and Bled (Slovenia). The workshop in Bulgaria was organized by START ENGINEERING JS Co.