



The Boiler Engineering Design Office (CBKK S.A.) was established in 1993 by the employees of Boiler Engineering Design Office - research and development unit with headquarters located in Tarnowskie Góry and existing since 1947. In 2012 CBKK S.A. became a part of Capital Group SEFAKO Sędziszów.

Since the beginning CBKK S.A. (and earlier CBKK) focuses on designing variety types of boilers and power plant equipment. Quite often the scope of realized projects does not limit to the main device (i.e. boiler, heat exchanger etc.) but also covers additional equipment and elements involving supporting structures, brickworks and insulation as well as control systems.

Detailed scope of design services provided by CBKK involves:

**1.Elaboration of complete documentation consisting of:**

- boiler thermal calculations
- strength analysis of the pressure equipment
- aerodynamic and hydraulic analysis
- circulation calculations
- mechanical and constructional analysis
- static analysis

Design works are performed in 5 departments specialized in individual subjects:

**Boiler Department offers:**

Documentation:

- Workshop project
- Assembly project
- Licence documentation
- Exploataion instructions
- Quality compliance project
- Start-up instructions
- As-built project

Calculations:

- Heat analysis
- Stress analysis
- Flow estimation
- Pipe stress analysis

Others:

- Variety analysis and research activities in the boilers area
- Erection supervision
- Compliance evaluation according to PED 97/23/WE



**Boiler Furnace and Firing Installation Department offers:**

- Boiler furnace systems for pulverized coal including:
  - transport of pulverized coal to boilers, dust burners, coal mills and coal bunkers inside boiler house
- Furnace grate systems for hard coal, brown coal and biomass;
- Furnace systems for diesel oil, heavy oil and other different liquid fuels including:
  - burners, oil stations near burners and main stations near boilers;
- Natural and technological gas furnace systems including:
  - burners, gases stations near burners and main stations near boilers;
- Retrofits of furnace systems with additional firing installation for low emission combustion
- Combustion chambers;
- Deslagers
- Extension grates
- Constructions of flue gases ducts, air ducts and others elements of combustion systems
- Constructions of ash hoppers and slug hoppers inside boiler house
- Mechanical systems for remove coal pyrites from ball-ring mills

**Steel Structure, Brickwork & Insulation Department offers:**

**Steel construction structures**

- Projects of steel supporting constructions for boilers and boiler house
- Flyovers, structures of panel walls, buckstays, boiler casings and band beams
- Bunkers, ash and slag hoppers
- Boiler service platforms and stairways
- Static-strength calculations, analysis, technical consultations and technical advice

**Insulation and brickworks**

- Thermal heat insulation and brickworks of boilers
- Thermal insulations for all types of devices, pipelines, turbines
- Technical expertise, consultation and technical advice

**Measurement and Control Systems Department offers:**

- Comprehensive design of automatic control system for boilers power engineering
- Comprehensive design of automatic control system for gas burners, oil burners, and other fuels
- Comprehensive design of automatic oil (and mazut) pump station
- Design and realization of I&C system for water treatment and heat exchangers station
- Design and realization devices of boiler
- Provides comprehensive, 'turnkey' services - from designing to servicing support installations for gas burners, oil burners, and other fuels



- PLC programming
- HMI programming

**Heat Exchangers, Power Engineering Equipment & Water Treatment Department offers:**

- LP and HP pressure regeneration heaters
- Heat exchangers
- Condensate and gland steam coolers
- Evaporators and flash tanks
- Thermal and chemical deaerators
- Feed water and condensate treatment stations
- Pressurized and non-pressurized tanks
- Pressure reduction cooling stations
- Pipelines
- Feed and grid water filters

**2. Based on our own documentation, CBKK S.A. accomplishes deliveries in the scope of :**

- Control and measurement devices involving
  - delivery of boiler control system incorporating PLC controllers and SCADA system (Simatic S7 + ASIX lub Simatic S7 + InTouch)
  - delivery of boiler control system incorporating DCS (Simatic PCS7)
  - delivery of control and measurement equipment (measurement apparatus manufactured by Profibus PA or 4...20mA)
  - realization of complex deliveries of electric apparatus and devices
- Power plant devices together with water treatment involving
  - LP and HP pressure regeneration heaters
  - Heat exchangers
  - Evaporators and flash tanks
  - Thermal and chemical deaerators
  - Feed water and condensate treatment stations
  - Pressurized and non-pressurized tanks
  - Pressure reduction cooling stations
- Start-up burners suited for variety fuels with start-up installation.

Design works are performed with utilization of modern software involving AUTODESK PRODUCT DESIGN SUITE 2013-2015, EPLAN, AUTODESK ROBOT (ARSA), Bentley AUTOPIPE, Bentley AUTOPLANT, VISUAL VESSEL DESIGN (VVD), SIEMENS STEP7, PROTOOL, PROLITE-CAD, MICROSOFT OFFICE SOFTWARE.



CBKK S.A. possess and employs rich documentation resources collected within its whole existence period and acquired in the course of many research and design realizations.

CBKK S.A. applies quality system according to PN-EN ISO 9001:2009 and possess certificate gained by TUV NORD no AC 090 100/0896/2381/2014.

**PERSON FOR CONTACT:**

Tadeusz Grucza – President of the Board

Hubert Smoraǵ – Member of the Board



## **LIST OF MORE IMPORTANT PROJECTS' REALIZED IN 2016 YEAR**

### **Boiler Department**

- Revitalization Project of the boiler OP-130 including design & documentation for PCC Rokita in Brzeg Dolny – elaborated for PCC Rokita.
- Conception project involving pressure part modernization of the boiler OP215 K2 in Chemical Plant Zakłady Azotowe "Puławy" S.A. in Puławy - elaborated for Boiler Manufacturer SEFAKO S.A. Sędziszów.
- Workshop and license documentation involving pressure part modernization of the recovery boiler OU 15 in Anwil S.A. Włocławek – elaborated for Boiler Manufacturer SEFAKO S.A. Sędziszów.
- Workshop and license documentation involving pressure part of the boiler OP650 K1 in ENERGA Elektrownie Ostrołęka S.A. in Ostrołęka – elaborated for ENERGA Serwis Sp. z o.o Ostrołęka.
- Thermal calculations involving modernization the boiler OP140 IP in Kwidzyn –elaborated
- Performance analysis of the boiler CKTI in Soda Polska CIECH S.A. EC Janikowo – elaborated for Soda Polska CIECH
- Workshop documentation of air heater bundles replacement of the boiler OFz40 A in PGNiG Termika EC Żerań – elaborated for Energomontaż Zachód Wrocław Sp. z o.o. Wrocław.
- Workshop documentation of air heater bundles replacement of the boiler OFz40 B in PGNiG Termika EC Żerań – elaborated for ZRE Katowice S.A.
- Numerical model and analysis of thermal and hydraulic performance of the biomass boiler BB20p located in the ENERGA Kogeneracja Sp. z o.o. Elbląg – elaborated for NERGA Inwest in Gdańsk.
- Workshop documentation of removable internal drum equipment of the boiler OP650 in EDF Polska S.A. Rybnik Department – elaborated for ZRE Katowice S.A.
- Workshop and assembly documentation of pressure part associated with assembly of SCR installation in the boilers OP 140 in IP Kwidzyn and ZEC Poznań Karolin – elaborated for SBB Energy S.A. Opole.
- Workshop documentation of soot blower installation enlargement of the boiler BFB100 located in Kogeneracja S.A. Zespół Elektrociepłowni Wrocławskich EC Czechnica - elaborated for Doosan Babcock Energy Polska S.A. Rybnik.
- Workshop and license documentation of condensing bundle replacement in the boiler WR25 in PGE Górnictwo I Energetyka Konwencjonalna S.A. EC Rzeszów Department – elaborated for MEGAZEC Sp. z o.o. Bydgoszcz.



### **Boiler furnace and Firing Installation Department**

- Modernization documentation of the start-up burners of the boiler OP-230 K6 and K7 in EDF Polska EC Gdynia – elaborated for ECOENERGIA Sp. z o.o. Warszawa.
- Modernization documentation of control system of the burner nozzle inclination angle at the boiler K2 and K3 in EC Poznań Karolin – elaborated for SBB Energy S.A. Opole.
- Modernization documentation of the start-up burners at the boiler WP 120 no 5 in EDF Polska EC Gdynia – elaborated for PUPH Inprex Sp. z o.o. Katowice
- Modernization documentation of the start-up burners at the boiler OP 230 no 3 in EC 3 Łódź – elaborated for Energotechnika-Energorozruch S.A. Gliwice
- Project of OFA nozzles individual control system at the boiler OP 650 no 3 in EI. Kozienice – elaborated for ENEA Wytwarzanie Sp. z o.o. – EI. Kozienice
- Revitalization documentation of the steam boiler OP-230 in PCC Rokita S.A. Brzeg Dolny in terms of firing system, coal intake as well as ash and slag withdrawal system – elaborated for ECOENERGIA Sp. z o.o. Warszawa.
- Workshop and assembly documentation of the pipe dryer and pulverized coal pipelines for the EI. Turów Project – elaborated for Energoprojekt S.A. Katowice.
- Workshop and assembly documentation of the cold hopper of the boiler OP 650 no 1 in ENERGA Elektrownie Ostrołęka S.A. in Ostrołęka – elaborated for ENERGA Serwis Sp. z o.o. Ostrołęka
- Workshop documentation of the flue gas ducts modernization of the recovery boiler OU 15 in Anwil S.A. Włocławek – elaborated for Boiler Manufacturer SEFAKO Sędziszów

### **Steel Structure, Brickwork & Insulation Department**

- Insulation documentation of the boiler BB 1880m TENT B in Obranovac Serbia – elaborated for RAFAKO S.A. Racibórz.
- Brickwork and insulation documentation of the boiler OP 380b in TE Morava Serbia – elaborated for RAFAKO S.A. Racibórz.
- Documentation of economizer duct insulation and sealing of the boiler OP 650 no 1 in ENERGA Elektrownie Ostrołęka S.A. in Ostrołęka – elaborated for ENERGA Serwis Sp. z o.o. Ostrołęka.
- Insulation and service platforms workshop documentation of the recovery boiler OU 15 in ANWIL S.A. Włocławek – elaborated for Boiler Manufacturer SEFAKO Sędziszów.
- Revitalization project of the boiler OP130 in PCC Rokita S.A. Brzeg Dolny in the scope of modernization and repair of the boiler's steel construction, insulation and service platforms – PCC Rokita S.A. Brzeg Dolny.



### **Measurement and Control Systems Department**

- Modernization documentation of the oil burners and their auxiliary installations for the boiler K6 (temporary arrangement). Documentation of installations associated with start-up burners for boiler K7 in EDF Polska S.A. Wybrzeże – EC Gdynia Department – elaborated for ECOENERGIA Sp.z o.o. Warszawa
- Documentation of start-up burners for the boiler WP-120 K5 in EDF Polska S.A. - Wybrzeże – EC Gdynia Department - elaborated for PUPH Inprex Sp.z o.o. Katowice
- Documentation and delivery of the control system, personnel training and participation in start-up involving modernization of automatic pyrite removal installation from coal mills at the boiler OP-650 K6 and delivery for the boiler K3 in EDF Rybnik – elaborated for Doosan Babcock Energy Polska S.A. Rybnik.
- Modernization documentation of the OFA nozzle control system at the boiler OP-650 no 3 in ENEA EI. Kozienice S.A. – elaborated for ENEA Wytwarzanie Sp.z o.o.
- Modernization documentation of the ovens and modification in the system of the fuel gas directed to the reforming ovens at the 2nd Ammonia Department in Chemical Plant “Puławy” S.A.
- Modernization conception of the boiler OP215 K2 involving reduction of the NOx emission in Grupa Azoty Zakłady Azotowe “Puławy” S.A. – elaborated for Boiler Manufacturer SEFAKO Sędziszów.
- Modernization documentation of start-up burners installation of the boiler OP-140 no 1 in Grupa Azoty Zakłady Azotowe Kędzierzyn S.A. – elaborated for PUPH Inprex Sp.z o.o. Katowice.
- Delivery of the air fan system supplying pilot burners MaxFire 10 mounted at installation H-102 and H-103 in Grupa Azoty Zakłady Azotowe Kędzierzyn S.A. – elaborated for IP&S Sp. z o.o. Lubiczów.

### **Heat exchangers, power plant equipment and water treatment Department**

- Documentation of three new heat water-water exchangers for EDF EC Gdańsk – elaborated for ENERGOREMONT Sp. z o.o. Krasnystaw.
- Documentation of the OXS heat exchanger for EDF EC Gdynia – elaborated for ENERGOREMONT Sp. z o.o. Krasnystaw.
- Documentation of the new cooler XK 1050 for EDF EC Gdynia – elaborated for ENERGOREMONT Sp. z o.o. Krasnystaw.
- Documentation of partial replacement of the cooling water pipeline and district water-side coupling pipeline in EDF EC Gdańsk – elaborated for Erbud Industry Pomorze Sp. z o.o. Gdańsk.
- Documentation of U-tube systems of heaters:



- a. PWU-240/200 – for EDF EC Wrocław
- b. PWU-250/210-2-210 for Veolia Energia Poznań ZEC S.A.
  - Elaborated for ENERGOREMONT Sp. z o.o. Krasnystaw.
  - Documentation of tube systems of heaters Psz-100 and Pp-120 for TAURON Wytwarzanie S.A. – El. Jaworzno III Department in Jaworzno – elaborated for PU BOR-POL Sp. z o.o. Brzeszcze
  - Analysis of the exchange heat area increase capability and documentation of the cooler V-1200-010 – elaborated for PGE Górnictwo i Energetyka Konwencjonalna S.A. El. Turów Department
  - Documentation of the boiler drum sodium phosphate dosing installation for the boiler OP-130 in PCC Rokita S.A. Brzeg Dolny
  - Modernization documentation of the deaeration system of district heating water in Fenice Poland Sp. z o.o. Rzeszów – elaborated for ZNNC Popek & Łobos Sp. j. Racibórz





## **LIST OF MORE IMPORTANT PROJECTS' REALIZED IN 2015 YEAR**

### **Boiler Department**

- Numerical model and thermal and hydraulic calculation of the biomass boiler BB20p located in ENERGA Kogeneracja Sp. z o.o. in Elbląg – elaborated for ENERGA Inwest Gdańsk.
- Workshop and assembly documentation of the drum internal equipment of the boiler OP430 K10 in EC Siekierki – elaborated for ENREM Połaniec.
- Workshop documentation of the drum internal equipment of the boiler OP650 no 4 and 5 in EDF El. Rybnik – elaborated for ZBM Racibórz.
- Workshop documentation downcomer pipes and water preheater of the boiler OP70 in Michelin Olsztyn – elaborated for ZRE Katowice Ostrołęka Department.
- Workshop and license documentation of the third stage of primary steam superheater of the boiler OP 650 in El. Rybnik – elaborated for EDF El. Rybnik.
- Workshop, assembly and license documentation of the primary steam superheater (wall component) of the boiler OP 650 no K12 in El. Rybnik – elaborated for Energotechnika Energorozruch S.A. Gliwice.
- Workshop, assembly and license documentation of the water preheater of the boiler OOG 320 K3 in Orlen Płock – elaborated for PAK Serwis Konin.
- Workshop and license documentation of the furnace waterwalls of the boiler OP 650 no K3 in El. Ostrołęka – elaborated for ENERGA Serwis Ostrołęka.
- Workshop and license documentation of the primary steam superheater pressure elements at the boilers OP 650 no 1÷12 in el. Rybnik – elaborated for Energotechnika Energorozruch S.A. Gliwice .
- Workshop and license documentation of the water preheater at the boilers OP 650 no 1÷4 and 5÷8 in El. Rybnik – elaborated for EDF El. Rybnik.
- Workshop and license documentation of the furnace waterwalls of the boiler OP 650 no K1 in El. Ostrołęka – elaborated for ENERGA Ostrołęka.

### **Boiler furnace and Firing Installation Department**

- Workshop and license documentation of the cold funnel of the boiler OP 650 no K2 in El. Ostrołęka – elaborated for ENERGA Serwis Ostrołęka.
- Workshop and assembly documentation of the air and flue gas channels for the JSCo Deven Bulgaria Project – elaborated for Foster Wheeler Branch Office Bulgaria.
- Workshop and assembly documentation involving cold hopper of the boiler OP 650 K3 in El. Ostrołęka – elaborated for ENERGA El. Ostrołęka.
- Workshop and assembly documentation involving cold hopper of the boiler OP 140 K6 in EC Będzin – elaborated for SBB Energy S.A. Opole.



- Documentation of the start-up burners installation of the new boiler OFz-140 in Synthos Dwory Oświęcim – elaborated for INPREX Sp. z o.o. Katowice.
- Workshop and assembly documentation of the air and flue gas channels at the boiler OOG 320 no 5 in PKN ORLEN Płock – elaborated for Polimex Energetyka Sp. z o.o. Warszawa.
- Workshop and assembly documentation of the OFA nozzles setting at the boiler WP 70 no K5 in EC Zofiówka – elaborated for SBB Energy S.A. Opole.
- Modernization documentation of the heavy oil treatment station in EI. Dolna Odra – elaborated for Inprex Sp z o.o. Katowice.
- Documentation of the secondary air control system of the pulverized coal burners at the boiler OP 650 no 4 in EDF EI. Rybnik – elaborated for ENERGOTECHNIKA ENERGOROZRUCH S.A. Gliwice Katowice.
- Documentation involving start-up burners installation of the boiler OP-140 in GA ZAK S.A. Kędzierzyn-Koźle – elaborated for INPREX Sp. z o.o. Katowice.
- Design project as well as workshop and assembly documentation involving gas installation retrofit and customization at the boilers OPG-230 no 1, 2, 3, 4, 5 fired with hard coal and mixed gas fuel, in order to provide the ability of co-incineration of hard coal and three gas fuels (mixture of blast furnace gas, BOS gas and natural gas as well as coke oven gas) in TAMEH Polska Sp. z o.o. Zakład Wytwarzania Nowa in Dąbrowa Górnicza – elaborated for TAMEH Polska Sp. z o.o. Zakład Wytwarzania Nowa in Dąbrowa Górnicza.
- Documentation of start-up burners installation at the boiler OP 650 K4 in EDF Polska S.A. Rybnik Department in the scope of technological side in order to fulfill actual UDT and CLDT regulations – elaborated for EDF Polska S.A. EI. Rybnik.

### **Steel Structure, Brickwork & Insulation Department**

- Casing of the second flue gas duct between +27,70 m and +30,35 m levels at the boiler OP-650 K2 in EI. Ostrołęka.
- Flue gas denitrification system at the boiler OP230 K5 in EC II Grupa Azoty SA - Static analysis of the supporting boiler structure.
- Workshop documentation of the burners and nozzles brickwork as well as secondary duct elements at the boiler OP230 K5 in EC Tarnów.
- Workshop documentation of the coal bunkers, secondary duct compensator and casing of passing duct of the boiler OP-650 K3 in Ostrołęka
- Workshop documentation of the secondary duct compensator at the boiler OP-650 K2 in Ostrołęka.
- Documentation of the reinforcement of beams located above coal mills for Power Units no 1 to 8 of 200 MW in Świerże Górne involving installation of two pneumatic jacks SWŁ10



of maximum load of 10t (manufacturer OMAG Oświęcim), without lowering maximum load of these beams.

- Design works associated with retrofitting of the boilers OP650 no 1 and 2 in EI. Pątnów.

### **Measurement and Control Systems Department**

- Project supervision involving installation start-up and participation in CLDT acceptance. Modernization of the burners control system at the boiler OP-650b K1 in EI. Pątnów.
- Documentation, deliveries, project supervision, installation start-up and participation in CLDT acceptance: Modernization of the burners control system at the boiler OP-650b K2 in EI. Pątnów.
- Documentation: Modernization of the gas burners installation and security system of the boiler OPG-230 no 1÷5 in TAMEH Polska Sp. z o.o. Zakład Wytwarzania Nowa in Dąbrowa Górnicza.
- Documentation and delivery of the control system involving start-up burners installation of the boiler P-140 no 1 in Grupa Azoty Zakłady Azotowe Kędzierzyn S.A.
- Documentation, project supervision, participation in CLDT acceptance: Modernization of the start-up burners of the boiler OFz-450 in PGNiG Termika EC Żerań
- Documentation, delivery of the control system, project supervision, installation start-up and participation in CLDT acceptance: Erection of the new fluidized bed boiler OFz-140. Start-up burners installation together with complete control system in Synthos Dwory.
- Documentation, delivery of the control system, project supervision and installation start-up: Erection of the new fluidized bed boiler OFz-140. External oil management in Synthos Dwory.
- Documentation, delivery of the control system, personnel training and participation in the installation start-up: Modernization of the control system of coal pyrites removal system from mills at the boiler OP-650 K3, K4 and K6 in EDF Rybnik.
- Documentation: Modernization of the start-up burners installation at the boiler OP-650 K4 in EDF Rybnik.
- Documentation update involving start-up burners installation associated with modernization of the boiler OP-650 K3 in EDF Rybnik.
- Documentation and deliveries involving control and measurements branch of the feed water deaerator in GRUPA AZOTY Zakłady Azotowe Kędzierzyn S.A.
- Documentation involving modernization of the start-up burners at the boiler K1 and K2 in EI. Koźienice.

### **Heat exchangers, power plant equipment and water treatment Department**

- Delivery of feed water deaerator for Azoty Kędzierzyn.
- Documentation of the new water-water heater of 90 MW thermal power for EI. Turów.



- Design works for Tauron – El. Trzebinia-Siersza, i.e.
  - a. pipeline reference points installation project;
  - b. modernization project of oil coolers tube systems;
  - c. project of the reduction stations of gland steam for the turbines TG1 and TG2
- Modernization documentation of the turbine condensate heat exchangers 2XABC and 5XAB in EC Gdańsk.
- Documentation of the tube systems of the heaters MVF300 no 4 and 6 in El. Adamów and heater Py-100-020 for Veolia Energia Łódź S.A. – EC Łódź.
- Technical documentation of the drain system of turbine TG5 in El. Koźienice
- As-built documentation update, elaboration of the operation and maintenance documentation and project supervision involving modernization of the HP and LP regeneration system, feed water tank and feed water deaerator at the units no 1÷5 in Tauron – El. Jaworzno III.



## **LIST OF MORE IMPORTANT PROJECTS' REALIZED IN 2014 YEAR**

### **Boiler Department**

- Workshop, assembly, license documentation and thermal calculations involving pressure part modernization of the boiler OP650b no 1 and 2 in El. Państw.
- Workshop, assembly and license documentation involving pressure part modernization of the boiler OP230 K1 in Z. Ch. Police.
- Workshop, assembly and license documentation involving pressure part modernization of the boiler OOG320 K2 and K3 in PKN Orlen.
- Workshop, assembly, license documentation and thermal calculations involving modernization of the feed water preheater for the assembly of SCR installation in the boiler OOG320 in PKN Orlen Płock.
- Modernization of the feed water preheater for the assembly of SCR installation in the boiler OP 650 no 1 and 2 in El. Koźienice.
- Workshop and assembly documentation involving the internal drum equipment modernization of the boiler OP650 no 7 and 8 in El. Rybnik.
- Workshop and license documentation involving pressure parts of the boiler OP 650 in El. Jaworzno III.
- Workshop, assembly and license documentation involving pressure parts of the boiler OP230 in EC Łódź IV.
- Workshop, assembly and license documentation involving pressure parts of the boiler BFB180 in EC Łódź IV.

### **Boiler furnace and Firing Installation Department**

- Design as well as workshop and assembly documentation of the air and flue gas channels at the boiler OOG-420 K6 PKN Orlen Płock.
- Design as well as workshop and assembly documentation of the air and flue gas channels at the boiler 2700 LENTJES no 3 in LOTOS Gdańsk.
- Design as well as workshop and assembly documentation involving modernization of the heavy oil installation at the boilers no 5 and 8 in El. Dolna Odra.
- Design as well as workshop and assembly documentation involving modernization of the start-up burners installation in EC Łódź IV.
- Design as well as workshop and assembly documentation involving building of the auxiliary furnace grate at the boilers OP 650 no 1 and 2 in ZEPAK Konin El. Państw.
- Design as well as workshop and assembly documentation involving air and flue gas channels modernization at the boiler OP 650 no 1 and 2 in ZEPAK Konin El. Państw.
- Design as well as workshop and assembly documentation involving modernization of the start-up burners installation at the boiler OFz-450 in EC Żerań.



- Design, workshop and assembly documentation, delivery as well as installation start-up involving modernization of the start-up burners at the boiler OP 230 no 1 in Z. Ch. Police.
- Design, workshop and assembly documentation as well as delivery of the fuel oil installation at the boiler OP 650 no 1 and 2 in ZEPAK Konin El. Pątnów.
- Design, workshop and assembly documentation, delivery as well as installation start-up involving modernization of the start-up burners at the boiler K1 and K2 in El. Opole.
- Design, workshop and assembly documentation involving modernization of the start-up burners at the boiler OP 650 no 9 in El Łaziska.
- Workshop documentation of the air and flue gas ducts at the boiler of 50 MWe for EC Tychy.

### **Steel Structure, Brickwork & Insulation Department**

- Design, workshop and assembly documentation as well as analysis and elaboration of repair instruction involving supporting structure, brickwork, insulation, casing and buckstays of the boiler OP 650 no 2 in El. Pątnów.
- Design and assembly documentation involving brickwork as well as ceiling and back wall insulation of the boiler OP 230 K2 in EC Łódź IV.
- Design and assembly documentation involving brickwork as well as ceiling and back wall insulation of the boiler BFB 180 K2 in EC Łódź IV.
- Insulation, casing, brickwork and elements dilation of the boiler OP 650-060 no 1 in El. Jaworzno III.
- Design and assembly documentation involving fuel oil and gas burner brickwork for the boiler OOG 320 K2 and K3 in PKN ORLEN Płock.
- Design and assembly documentation involving fuel oil and gas burner brickwork for the boiler 2700 K3 Lentjes in LOTOS Gdańsk.
- Workshop and assembly documentation involving buckstays of the boiler OOG 320 no K1, K2 and K3 in PKN Orlen Płock.
- Workshop and assembly documentation involving modernization of the mechanical parts (i.e. structure elements, service platforms, ECO casing) of the boiler 2700 K3 Lentjes in LOTOS Gdańsk.

### **Measurement and Control Systems Department**

- Design, workshop and assembly documentation as well as participation in start-up involving modernization of the oil burners control system at the boiler OP 650 no 8 in El. Dolna Odra.
- Design as well as workshop and assembly documentation involving modernization of the control system at the power unit BC100 in ED Łódź IV – Concerning the part associated with modernization of the start-up burners.



- Design, workshop and assembly documentation, delivery, assembly as well as start-up involving modernization of the start-up burners installation of the boiler OP 230 no 1 in Z. Ch. Police. Control and measurement branch.
- A “turn-key” modernization of the boilers K-1 and K-2 in El. Pątnów. The stage of design, workshop and assembly documentation, delivery, assembly as well as start-up involving control and measurement branch.
- Design, workshop and assembly documentation as well as delivery management involving modernization of the burners control system at the boilers K-1 and K-2 in El. Pątnów.
- Design as well as workshop and assembly documentation involving modernization of the control system responsible for regulation of heavy oil levels (I to III) in the process unit supplying start-up burners of boilers K1 and K2 in PGE GiEK S.A. El. Opole Department.
- Design as well as workshop and assembly documentation involving transition from coke to natural gas at the boiler OPG-430 no 6 in TAURON Ciepło S.A. Zakład Wytwarzania NOWA. Control and measurement branch.
- Documentation update involving the start-up and pulverized coal burners control system at the boiler OP-650 no 8 in EDF El. Rybnik.
- Documentation and project supervision of the start-up burners modernization at the boilers OFz-450 B in PGNiG Termika EC Żerań.
- Documentation and project supervision of the light oil storage and supply installation modernization in PGNiG Termika EC Żerań.
- Design, workshop and assembly documentation as well as delivery and participation in installation start-up involving modernization of the control system of coal pyrites removal system from mills at the boiler OP-650 K7 and K8 in EDF Rybnik.
- Design and documentation of the start-up burners installation modernization of the boiler OP-650 K9 in TAURON Wytwarzanie S.A. El. Łaziska Department.

#### **Heat exchangers, power plant equipment and water treatment Department**

- Design, workshop and assembly documentation as well as delivery involving HP spiral regeneration heat exchangers PWC5, PWC6 and PWC7 for the turbogenerators TG1 and TG2 in El. Pątnów.
- Design, workshop and assembly documentation as well as delivery of elements and auxiliary equipment involving modernization of deaerating stations for the turbogenerators TG1 and TG2 in El. Pątnów.
- Design, workshop and assembly documentation as well as project supervision involving deaeration station and water-water heat exchanger for the new power unit 460 MW in ANWIL Włocławek.
- Design as well as workshop and assembly documentation involving Py-100-030 heaters for the turbine TG-6 in El. Skawina.



- Design as well as workshop and assembly documentation involving modernization of the tube systems of PWC-6, PWC-7 and PWC-8 heaters for the turbine TG-6 in El. Skawina.
- As-built documentation update, elaboration of maintenance documentation and project supervision involving modernization of HP and LP regeneration heaters, feed water tank and feed water deaerators for the Power Unit no 3 in El. Jaworzno III.
- Design as well as workshop and assembly documentation involving modernization of the turbine heater HK1900/2004/2/1 for the Power Unit no 1 in ELCHO Chorzów.





## **LIST OF MORE IMPORTANT PROJECTS' REALIZED IN 2013 YEAR**

### **Boiler Department**

- Workshop, assembly, license documentation and thermal calculations involving pressure part modernization of the boiler OP650b no 1 in EI. Pałnów.
- Workshop, assembly, license documentation and thermal calculations involving feed water preheater modernization at the boilers OOG 420 K5 and K6 in PKN Orlen Płock.
- Workshop, assembly, license documentation and thermal calculations involving feed water preheater modernization at the boiler OP 215 no 2 in ZA Puławy.
- Workshop, assembly and license documentation involving pressure part modernization of the boiler OOG 320 K1 PKN Orlen.
- Workshop, assembly and license documentation involving pressure part modernization (involving combustion chamber, superheaters and internal drum equipment) at the boiler OP 650 in EI. Łaziska.
- Workshop, assembly and license documentation involving pressure part modernization of the boiler OP 230 K2 in Z. Ch. Police.
- Workshop, assembly, license documentation and thermal calculations involving feed water preheater and pressure part modernization of the boiler 2700 K2 Lentjes in Lotos Gdańsk.
- Workshop, assembly and license documentation involving internal drum equipment modernization at the boiler OP 430 in EC Kraków.
- Boiler performance analysis associated with modernization of the feed water preheater of the bark-fired boiler located in International Paper Kwidzyn.
- Workshop, assembly and license documentation involving pressure part modernization of the boilers OP 430 and OP 380 in EC Siekierki.
- Elaboration of analysis of additional dimers combustion in the Pauker boilers OP 230 and OP 130 in Z. Ch. Synthos Oświęcim.
- Workshop, assembly, license documentation and thermal calculations involving division of the feed water preheater for the assembly of flue gases catalyst (denitrification) at the boiler OOG 420 no 7 in PKN ORLEN S.A. Płock.

### **Boiler furnace and Firing Installation Department**

- Design as well as workshop and assembly documentation of the air and flue gas channels for the boiler OOG-420 K6 PKN Orlen Płock.
- Design, workshop and assembly documentation as well as deliveries, assembly and start-up of the burner with its near station and flue gases cooling system for the installation 419E in Z.A. Puławy.
- Design as well as workshop and assembly documentation of the MEAK incineration



- installation, designed to be mounted at the boiler OP-215 no 4 and 5 in Z. A. Puławy.
- Design as well as workshop and assembly documentation involving flue gas ducts compensators, measurement points and anti-explosion traps at the boiler OP 230 no 1 in Z. Ch. Police.
  - Design as well as workshop and assembly documentation of the air and flue gas channels for the LENTJES boiler no 2 in Lotos Gdańsk.
  - Design as well as workshop and assembly documentation involving modernization of the heavy oil installation at the boilers no 5 and 8 in El. Dolna Odra.
  - Design as well as workshop and assembly documentation involving replacement of the start-up burners installation at the boiler WP 200 03K in EC Kawęczyn.
  - Design as well as workshop and assembly documentation involving modernization of the start-up burners installation at the power unit BC 100 in EC 4 Dalkia Łódź.
  - Design, workshop and assembly documentation, delivery as well as process start-up involving the heavy oil start-up burners installation at the boiler OP 230 no 2 in Z. Ch. Police.
  - Project supervision involving renovation and star-up of the gas burners at the boilers K4 and K5 in Z.A. Puławy.

### **Steel Structure, Brickwork & Insulation Department**

- Design, workshop and assembly documentation as well as analysis and elaboration of repair instructions involving supporting structure, brickwork, insulation, casing and buckstays of the boiler OP 650 no 1 in El. Pątnów.
- Design and assembly documentation involving brickwork, ceiling insulation as well as passing duct construction and sealing of hopper of the boiler OP 230 K2 in Z. Ch. Police.
- Design and assembly documentation involving brickwork, insulation and external casing of the boiler WR5-022 in EC Żychlin.
- Design, workshop and assembly documentation involving brickwork of the LMF burner of type ASK-T as well as buckstays and hopper elements of the boiler OO420 – K5 no 792 in PKN ORLEN Płock.
- Design, workshop and assembly documentation involving brickwork, insulation as well as structure and casing of the burner air chamber at the boiler OP650-010 in El. Łaziska.
- Design and assembly documentation involving brickwork and ceiling insulation in the proximity of third stage superheater at the boiler OP650-040 K8 in El. Kozienice.
- Design and assembly documentation involving burner brickwork at the boiler 2700 – K2 in LOTOS S.A. Gdańsk.
- Design and assembly documentation involving gas-oil burner brickwork of type ASK-T located in the boiler OOG 320 in PKN Orlen Płock.



### **Measurement and Control Systems Department**

- Design, workshop and assembly documentation as well as delivery, assembly and participation in start-up involving modernization of the burners control system with its near station and flue gases cooling system at the installation 419E located in ZA Puławy (Chemistry Department).
- Update of the start-up installation control system documentation of the boiler OP-650 no 5 with pulverized coal burners in EDF EI. Rybnik.
- Deliveries and participation in start-up involving development of the software for the driver S7-300F involving application for its communication with visualization system ASIX and control system of the motor drive in Koksownia "Nowa" in Częstochowa.
- Elaboration of conception of fuel oil installation supplying boiler no 1 to 4 at the pump room in PGE GiEK S.A. EI. Opole Department.
- Design as well as workshop and assembly documentation involving modernization of the control system of the power unit BC100 in ED Łódź IV – concerning the part associated with modernization of the start-up burners.
- Design, workshop and assembly documentation as well as participation in start-up involving modernization of the oil burners control system at the boiler OP-650 no 5 in EI. Dolna Odra.
- Design as well as workshop and assembly documentation involving replacement of the start-up burners installation at the boiler WP 200 03K in EC Kawęczyn. Control and measurement branch.
- Design, workshop and assembly documentation as well as delivery and start-up involving redesign of the make-up DH water deaeration station (no 1) in EC Lublin Wrotków. Control and measurement branch.
- Design, workshop and assembly documentation as well as delivery, assembly and start-up involving modernization of the start-up burners control of the boiler OP-230 no 2 in Z. Ch. Police S.A. Control and measurement branch.
- A "turn-key" modernization of the boilers K-1 and K-2 in EI. Pątnów associated with construction of NOx emission reduction installations. The stage of design, workshop and assembly documentation, involving control and measurement branch.
- Design as well as workshop and assembly documentation involving modernization of the burners control system at the boiler K1 in EI. Pątnów.
- Design as well as workshop and assembly documentation involving modernization of the primary condensate system associated with regeneration heaters XN4 and XN5 at the 200MW Power Unit no 8 in EDF EI. Rybnik. Control and measurement branch.
- Design as well as workshop and assembly documentation involving modernization of the control system responsible for regulation of heavy oil levels (I to III) at the near station supplying start-up burners of boiler K1 in PGE GiEK S.A. EI. Opole Department.



**Heat exchangers, power plant equipment and water treatment Department**

- Design, workshop and assembly documentation as well as delivery involving HP spiral regeneration heat exchangers PWC5, PWC6 and PWC7 for the turbogenerators TG1 and TG2 in EI. Pątnów.
- Design, workshop and assembly documentation as well as delivery of elements and auxiliary equipment involving deaeration stations modernization for the turbogenerators TG1 and TG2 in EI. Pątnów.
- Design, workshop and assembly documentation as well as delivery of elements involving redesign of the make-up DH water deaeration station (no 1) in EC Lublin Wrotków.
- Delivery of the WEKA magnetic level gauges for EI. Jaworzno III.
- Design as well as workshop and assembly documentation involving deaeration station and water-water heat exchanger for the new power unit 460 MW in ANWIL Włocławek.
- Design as well as workshop and assembly documentation involving deaeration station of 250 t/h capacity for Koksownia Przyjaźń.
- Design as well as workshop and assembly documentation involving HP U-tube heater PWU-153 for Z. Ch. Police.
- Design as well as workshop and assembly documentation involving modernization of the primary condensate system associated with regeneration heaters XN4 and XN5 at the 200MW Power Unit in EDF EI. Rybnik.



## **LIST OF MORE IMPORTANT PROJECTS' REALIZED IN 2012 YEAR**

### **Boiler Department**

- Workshop and assembly involving combustion chamber modernization of the boiler OP650b no 5 in EI. Państwów.
- Workshop documentation of the biomass boiler of steam capacity equal to 90t/h in EC Elbląg.
- Design and workshop documentation of the feed water preheater for Hogdalen in Sweden.
- Workshop documentation of the biomass boiler for Kogeban - France. Elaborated for RAFAKO Racibórz.
- Design and workshop documentation of the drum internal equipment at the boiler OP 650 for EI. Jaworzno III.
- Documentation update involving boilers OP650 in EI. Ostrołęka.
- Analysis of OP650 boiler hangers in EI. Koźienice.
- Design and workshop documentation of the steam-air heaters in EI. Połaniec.
- Workshop documentation of the steam pipelines at the boiler CKTI 75 in EC Janikowo.
- Workshop documentation of the third stage steam superheater at the boiler OP650 in EI. Rybnik.
- Documentation update involving boiler OP430 in EC Siekierki.
- Design as well as workshop and assembly documentation involving division of the feed water preheater for the assembly of flue gases catalyst (denitrification) at the boiler OOG 420 no 7 in PKN ORLEN S.A. Płock.

### **Boiler furnace and Firing Installation Department**

- Replacement of the devices associated with heavy oil installation suited for decreased pressure parameters in the range of fuel oil pump room and boilers 1 and 2 in EI. Opole.
- Air and flue gas channels for the biomass boiler in EI. Elbląg.
- Retrofit of the ROW type burner installation in KWK Krupiński.
- Update of the oil burners in EI. Rybnik.
- Documentation of complete oil burners installation at the boiler K3 in EI. Koźienice.
- Start-up burner for the boiler WR-40 in EC Tychy.
- Heavy oil installation at BC 100 in EC Karolin.
- Replacement of the air preheater at the boiler OP-650 in EI. Połaniec.
- Air and flue gas channels for the boiler OOG 420 PKN ORLEN Płock.
- Modernization of the coal dust pipelines of the boiler OP-650 no 2, 3, 6 and 7 in EI. Połaniec.
- Modernization of the burner 419E in ZA Puławy.



- Modernization of pyrites removal control system of coal mill installed at the boiler OP-650K in El. Rybnik.

### **Steel Structure, Brickwork & Insulation Department**

- Insulation make-up of the flue gas ducts for denitrification installation (SCR) at the boilers K10, K11, K14 and K15 in EC Siekierki – Warszawa.
- Brickwork and insulation of the revitalized boiler BB-1880 Nikola Tesla B1 in Serbia.
- Modernization of the OP430-K15 boiler involving brickwork, insulation and service platform in EC Siekierki Warszawa.
- Brickwork of burner of type ASK-T as well as buckstays and hopper elements mounted at the boiler OO420-K6 in PKN ORLEN Płock.
- Sealing of the secondary duct walls in the region of ECO pipes crossings at the boiler K11 in El. Łaziska (STRABAG).
- Design, workshop and assembly documentation as well as analysis and elaboration of repair instructions involving supporting structure, brickwork, insulation, casing and buckstays of the boiler OP 650 no 1 in El. Pątnów.

### **Measurement and Control Systems Department**

- Documentation, delivery and participation in start-up involving modernization of the start-up burners control system at the boiler OP-650 no 3 in ENEA Wytwarzanie El. Kozeinice Department.
- Documentation, delivery and participation in start-up involving oil burners installation for the new boiler OFz-201 in TAURON Wytwarzanie El. Jaworzno II Department.
- Documentation, delivery, assembly and start-up involving modernization of oil burner of type ROW 2A mounted at the flotation concentrate drying department in JSW KWK Krupiński.
- Documentation involving modernization of the start-up burners installation at the boiler OP-430 2K in Dalkia Poznań.
- Documentation update involving start-up burners installation at the boiler OP-650 no 5 and algorithms of pulverized coal burners in EDF El. Rybnik.
- Documentation involving modernization of the gas burner of the hydroxyloamine installation 419E in ZA Puławy (Chemistry Department).
- Documentation and delivery involving modernization of the drum level measurement system at the boiler OP-650 no 4 in TAURON Wytwarzanie El. Jaworzno III Department.
- Documentation and delivery involving modernization of the make-up DH water deaeration station for boilers no 1 and no 2 – II stage in PGE El. Lublin-Wrotków Department.
- As-built documentation involving modernization of the control and measurement system of the boiler CKTI-75 no 3 in EC Janikowo.



- Documentation update involving start-up burners installation at the boiler OP 650 no 1 in EDF El. Rybnik.

**Heat exchangers, power plant equipment and water treatment Department**

- Documentation of the deaeration station for EC Kielce.
- Documentation of the HP regeneration heaters PWP I and PWP II for turbine TG3 in ZA Puławy.
- Documentation involving modernization of PWS spiral heaters for El. Jaworzno II.
- Documentation involving modernization of deaeration station no 3 and 4 in El. Jaworzno II.
- Documentation involving modernization of the U-tube system of the heater PWU-200/165-4S1-040 for Michelin Polska S.A. Olsztyn.
- Delivery of two heat exchangers and 14 pressure and non-pressure tanks for the new Power Unit BC50 in EC 1 Bielsko-Biała.