

# Piping Systems for Nuclear Power Industry

Prague, October 2011

# Introduction of the company

- Leading Czech supplier of piping systems for power engineering
- 60 years of experience in the field of power industry
- Experience in nuclear power since 1958
- Historical supplies for more than 330 power plant units with total output exceeding 50 000 MW including 22 NPP units
- Comprehensive services from detail design to commissioning
- Treatment of all material grades including hi-alloy and stainless steel
- Specialist for supercritical steam parameters and nuclear power piping
- Quality system certified since 1994 according to ISO 9001
- Production according to European, American and Russian standards (ČSN, EN, DIN, ASME, API and GOST)

# Historical dates

- 1913** Foundation of **Karel Schulz Machinery Enterprise**
- 1947** Incorporation into **ČKD** Holding – start of production for power industry
- 1951** State enterprise „**Modřanské strojírny**“
- 1965** **SIGMA Modřany** - Incorporation in SIGMA Holding
- 1993** Privatization and establishment of independent joint stock companies **Modřanská potrubní** and MOSTRO
- 2005** Member of CTY Group
- 2010** Acquisition of MOSTRO
- 2011** New company name **MODŘANY Power**

# Production program

- **Turn-key supply**

*Design, Production, Procurement, Erection or Erection supervision, Commissioning*

- **Production of pipe components**

*Pipe bends, fittings, measuring nozzles, steam coolers, separators, valves, pressure locks, pipe supports, pipe whip restraints, hermetic bushings*

- **Engineering activities**

*Design, calculations, consultancy, research and development*

- **Erection and service**

*Installation, overhauls, maintenance and service of piping, valves and pipe supports*



# Scope of supply for NPP units VVER type

- Turn-key supply (design, prefabrication, erection and commissioning) including valves, pipe supports and hangers, insulation and I&C Systems for following operational packages:
  - Main circulating piping
  - Complete steam and feed water piping inside and outside the containment including valves, reducing and by-pass stations
  - Emergency systems and other piping systems of primary circuit
  - Inserted cooling circuits including valves, pumps, heat exchangers and tanks
  - Volume compensation system (volume compensator, bubbling tank), safety valves and other valves and piping
  - Piping of technical and operational gas



Prefabricated pipe spools of the main circulating piping DN 850

# Production capacity

- Production capacity 250 t / month
- Human resources 340 000 hours/year
  - Thereof :
    - Engineering 50 000 hours/year
    - Production 120 000 hours/year
    - Erection 170 000 hours/year
- Lifting capacity 12 500 kg, 6 m
- Transport possibility
  - Truck 2,4 x 2,2 x 12,0 m (w x h x l), 20 t
  - Railway 2,7 x 2 x 12,5 m (w x h x l), 40 t

*(Both for rail and truck transport it is possible to provide special oversize transport means.)*



# Pipe bending

- Induction bending
  - diameter (D) 44 - 1 020 mm
  - wall thickness (S) up to 105 mm
  - maximal weight 12,5 t
  - multiple and 3D bending
- Cold bending
  - diameter (D) 14 - 70 mm
  - wall thickness (S) 2 - 8 mm

Three inductive bending machines (EOS 630, PB 1000, PB 850 Special)

Three cold bending machines (Herber, Maxim)





# Production possibilities

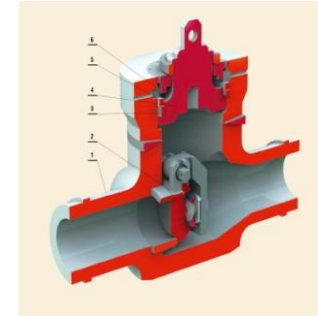
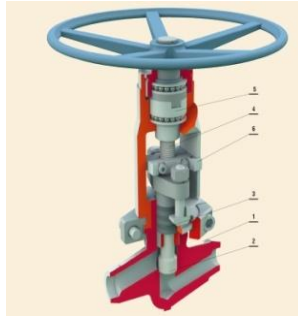
- Welding  
carbon steel, alloy steel, stainless steel and  
heat resisting steel (P91, P92)  
111, 141, 121, 135 (SMAW, GTAW, SAW, MAG)  
electrical equipment for preheating and heat treatment
- Heat treatment  
max. 8 x 4 x 2 m, 1100 °C (4 furnaces, gas or electric)
- Grit blasting  
minimum inside  $\varnothing$  22 mm  
outside dimension 12000 x 6000 x 3450 mm  
the abrasive used – steel grit GL 50, GL 80



# Subsidiary company MOSTRO, a.s.

**MOSTRO**  
valves

- MODŘANY Power ownership: 100 %



- Production programme:
  - Valves for fossil and nuclear power plants
  - Special valves
  - Stainless steel valves
- Certification: ISO 9001, ISO 14001, PED 97/23/EC, GOST-R
- Komplex supply of valves including actuators, spare parts and accessories

**MODŘANY**  
power

# Subsidiary company MODŘANY Slovakia, s.r.o.

**MODŘANY**  
Slovakia

- MODŘANY Power ownership – 100 %



- Production programme :
  - Installation, repairs and reconstruction of technological equipment for power engineering
  - Supply of Modranska potrubni products to Slovakia
  - Consultancy and engineering services in the field of power engineering
- Certification: ISO 9001

**MODŘANY**  
power

# Certification

## Management Systems

- **Quality Management System**  
certified according to ISO 9001:2008 for design, development, manufacture, assembly and sales of connecting piping for the conventional and nuclear power
- **Environmental Management System**  
certified according to CSN EN ISO14001:2005
- **According to EN**
  - 97/23/ES – Modul G
- **According to ASME CODE**
  - Manufacture of Pressure Vessels, Stamp „U“
  - Manufacture and assembly of Power Boilers, Stamp „S“



# Supply of complete piping systems for Nuclear power plants

Country	Year	Name of project	Scope of work
Bulgaria	1990	Belene 1000 MW, VVER	Prefabrication of main circulation piping (presently installed in 4. unit of NPP Kalininskaya)
Czech Republic	1986	Dukovany 4x440 MW, VVER	Design, prefabrication and erection of main circulation piping and complete connecting piping of primary and secondary circuit
Czech Republic	2001	Temelín 2x1000 MW, VVER	Design, prefabrication and erection of main circulation piping and complete connecting piping of primary and secondary circuit
Poland	1986	Žarnovec 2x440 MW, VVER	Prefabrication of main circulation piping and main section valves
Slovakia	1969	Jaslovské Bohunice A1 150 MW, KS-150	Design, prefabrication and erection of main circulation piping and complete connecting piping of primary and secondary circuit
Slovakia	1978	Jaslovské Bohunice V1 2x440 MW, VVER	Prefabrication and erection of connecting piping in primary and secondary circuit
Slovakia	1984	Jaslovské Bohunice V2 2x440 MW, VVER	Design, prefabrication and erection of main circulation piping and complete connecting piping of primary and secondary circuit
Slovakia	1998	Mochovce 2x440 MW, VVER	Design, prefabrication and erection of main circulation piping and complete connecting piping of primary and secondary circuit
Ukraine	1985	Rovenskaja 1x440 MW	Prefabrication of stainless steel piping for primary circuit and supply of main section valves

# Selected references for Nuclear power plants since 2000

Country	Year	Project	Scope of work
China	2003	Jiangsu Ťjaňvan	Supply of rubber expansion joints DN 2400.
Slovakia	2003	JE V2 Jaslovské Bohunice	Manufacture of pipe components for project: „MO6 and M02 modernization of NPP V2 Jaslovske Bohunice“ for units 3 and 4.
Czech Republic	2007	NPP Dukovany	Design, delivery and erection of equipment for the project: „Exchange of measuring nozzles and separators in steam piping between steam generator and turbine control valve at all units.“
Czech Republic	2007	NPP Temelín	Design, delivery and erection of equipment for the project: „Exchange of quick-acting valves at main steam piping at both units“ in order to reduce vibrations.
Czech Republic	2008	NPP Temelín	Design, delivery and assembly of equipment for the „Replacement of DN800 Stop Flap Valves in Feed Pump Suction Lines“.
Slovakia	2008	NPP V2 Jaslovské Bohunice	Delivery of measuring nozzles and separators in steam pipeline between steam generator and turbine control valve of Units 3 and 4 to reduce pressure losses in the scope of design, prefabrication, delivery, assembly, and commissioning.
Czech Rep.	2009	NPP Temelín	Completion of regulating valves DN300 for displacement pumps of TG1 and 2
Russia	2009	NPP Kalininskaya	Production documentation of the main circulation piping manufactured in MODRANY Power originally for 2 units VVER 1000 in NPP Belene.
Russia	2010	NPP Kalininskaya	Supply of gate valves for primary and secondary circuit of unit 4.
Russia	2010 2011		Supply of spare parts for valves of nuclear power plants Kurskaya, Rostovskaya, Kalininskaya.
Slovakia	2010	NPP V2 Jaslovské Bohunice	Design, delivery and erection of pipe components for project „Flow rate increasing of by-passes to condenser“ on units 1 and 2.

# The most important current projects

Country	Project	Customer	Scope of work
Czech Republic	Tušimice II 4 x 200 MW	Škoda Praha Invest	Design, prefabrication, erection and commissioning of the new piping systems for complete refurbishment of coal power plant in the scope of Critical piping (main steam, hot reheat steam and cold reheat steam piping) and BOP piping.
Czech Republic	Tušimice II 4 x 200 MW	ŠKODA POWER	Design, prefabrication and erection of piping spools for refurbishment of turbine island in existing coal power plant.
Czech Republic	Ledvice 660 MW	Škoda Praha Invest	Design, manufacture and erection of piping systems for the project: „OB12 – Critical piping for the new supercritical parameters unit“.
Czech Republic	Prunéřov 840 MW	Škoda Praha Invest	Design, manufacture and erection of critical and BOP piping systems.
Slovakia	NPP Mochovce 3, 4	ŠKODA JS	Design, delivery and erection of all piping systems in the nuclear island of new units 3 and 4.
Slovakia	NPP Mochovce 3, 4	Slovenské elektrárne (Enel)	Erection of complete piping systems in the turbine island of new units 3 and 4.

# References – NPP Mochovce 3, 4

## 2 x 440 MW, VVER 440

- **Location:**

Slovakia, Mochovce

- **Customer:**

ŠKODA JS, a.s.

Slovenské elektrárne, a.s., (ENEL SpA)

- **Operator:**

Slovenské elektrárne, a.s., (ENEL SpA)

- **Scope of work:**

Supply of piping systems for the nuclear island of

units 3 and 4 in the scope of:

- Pressurizing system,

- Primary piping

- Intermediate cooling systems

Scope of supply includes design, prefabrication, installation and commissioning.

Installation of complete piping systems in turbine island.

- **Project schedule:**

June 2009 to October 2013





# Why cooperate with MODŘANY Power?

We provide comprehensive services of the highest quality in the field of piping for power engineering.

## Our strengths:

- Tradition and more than 60 years of experience
- Qualified personnel
- Certified system of quality management
- Wide experiences in cooperation with prestigious customers
- Full service under one roof: from basic design to commissioning

Thank you for your attention!

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