

NUCLEAR POWER DELIVERIES

Ing. Martin Pecina, MBA
General director
VÍTKOVICE POWER ENGINEERING a. s.

25. – 26. 10. 2011
ATOMEX Prague



- We are the most significant Central European machinery group with strong position in selected segments of machinery production and in field of deliveries of Great investment units.
- We contain about sixty companies.
- In year 2011 we will celebrate 183rd birthday.



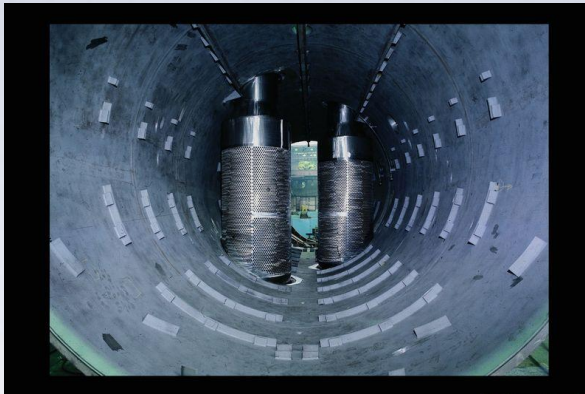




NUCLEAR POWER DELIVERIES

Steam generator VVER 440

- Manufactured 66 pcs.
- Deliveries for NPP Dukovany (Czech Republic), Bohunice (Slovakia), Nord (Germany), Žarnovce (Poland), Mochovce (Slovakia)

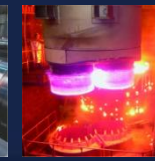




NUCLEAR POWER DELIVERIES

Steam generator VVER 440

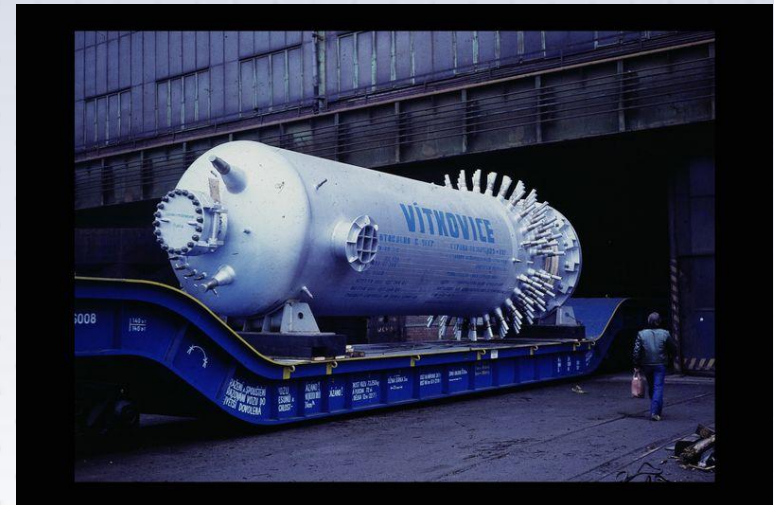


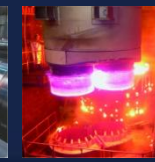


NUCLEAR POWER DELIVERIES

Volume compensator VVER 440

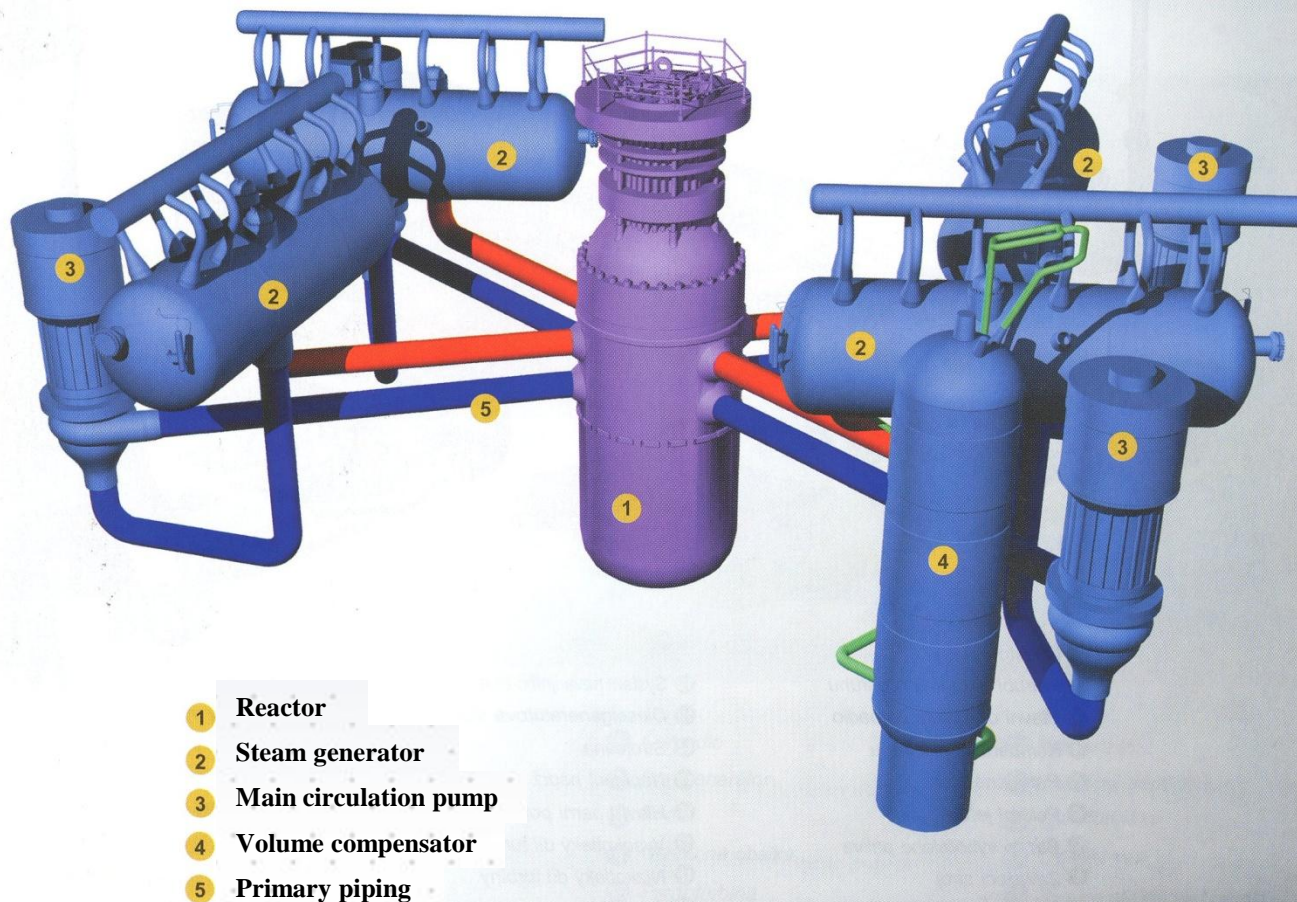
- Manufactured 18 pcs.
- Deliveries for NPP PAKS (Hungary), KOLSKA (Russia), Rovenska (Ukraine), Dukovany (Czech Republic), Bohunice (Slovakia), Mochovce (Slovakia)





NUCLEAR POWER DELIVERIES

Scheme of 1st circuit of Nuclear power station VVER 1000





NUCLEAR POWER DELIVERIES

Steam generator VVER 1000

- Manufactured 8 pcs.
- Deliveries for Temelín NPP (Czech republic)





NUCLEAR POWER DELIVERIES

Steam generator VVER 1000

Delivery for Temelín NPP (Czech Republic)

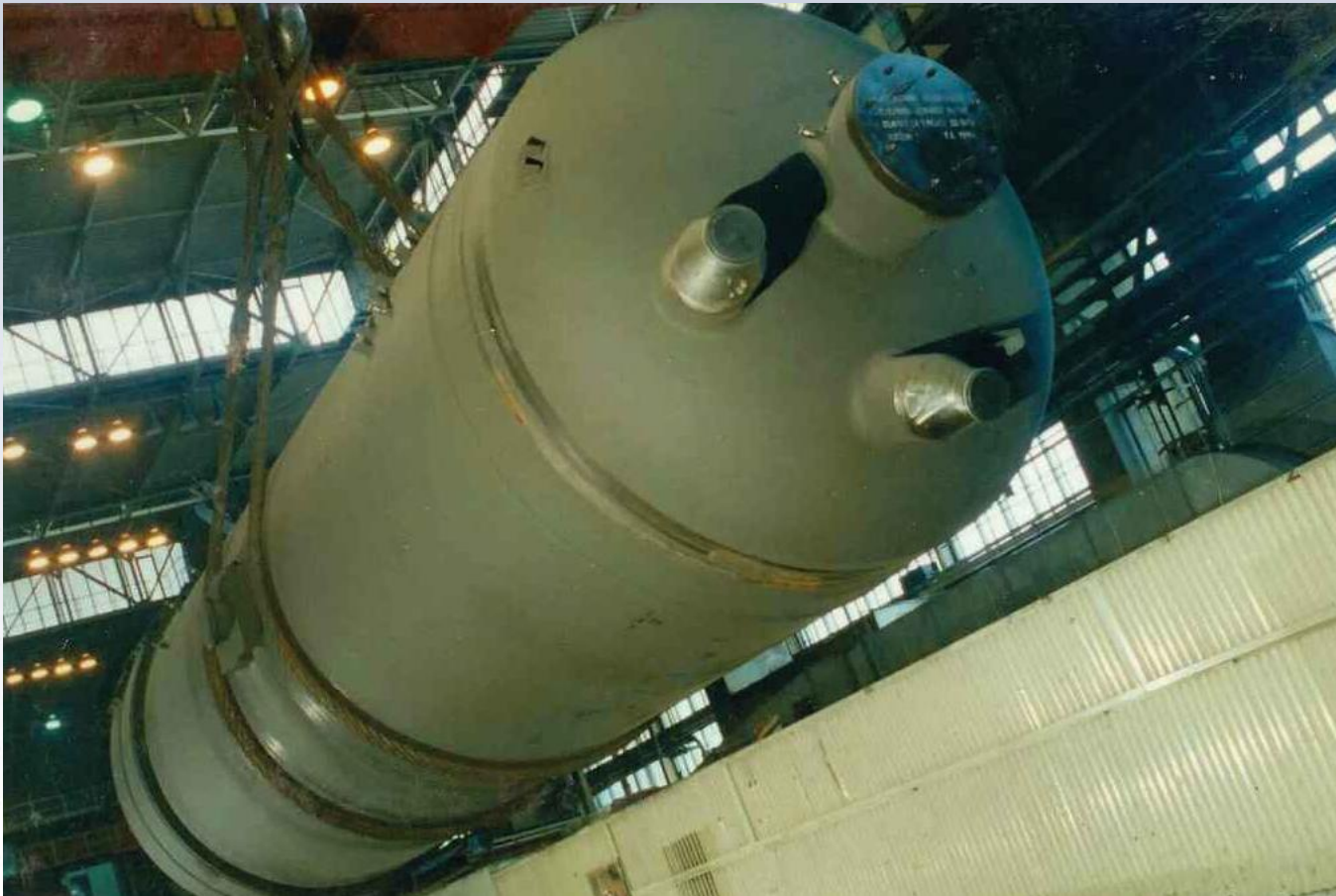




NUCLEAR POWER DELIVERIES

Pressurizer VVER 1000

- Manufactured 3 pcs.
- Deliveries for NPP Belene (Bulgaria) and Temelin (Czech republic)

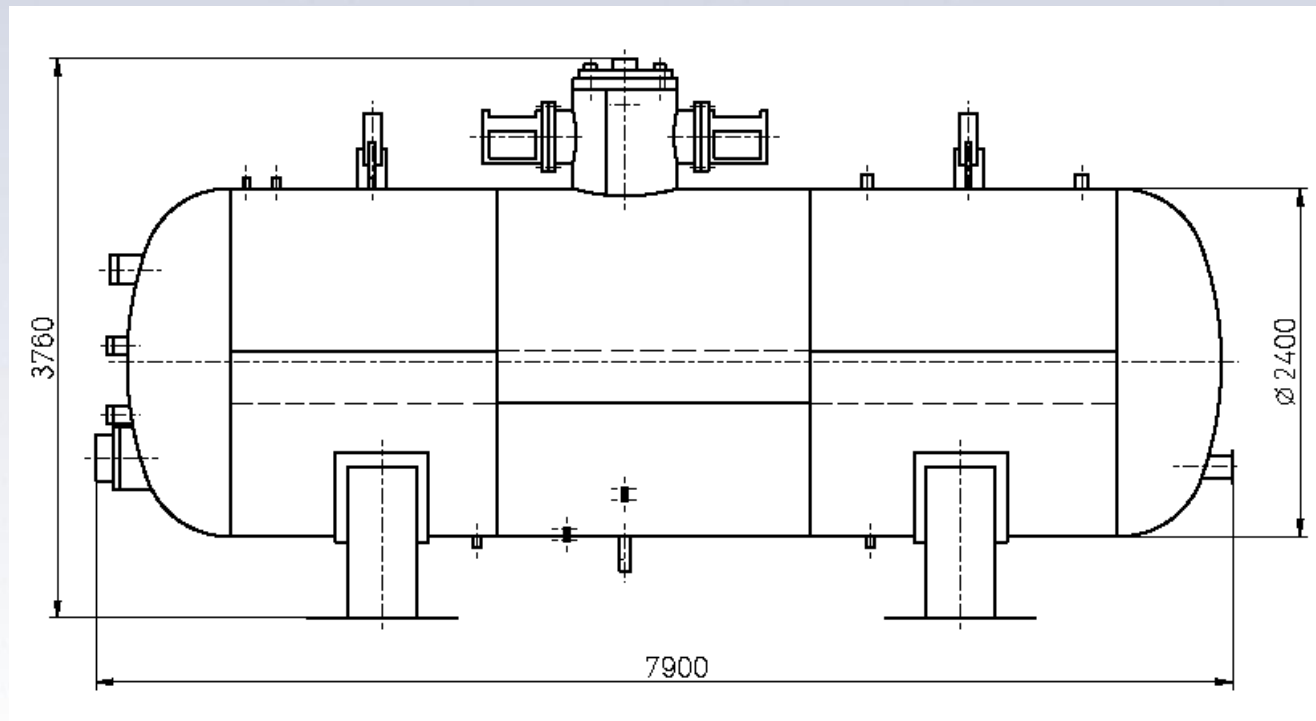




NUCLEAR POWER DELIVERIES

Barboter VVER 1000

- Manufactured 2 pcs.
- Deliveries for Temelin NPP (Czech republic)



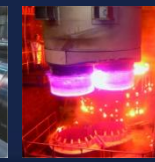


NUCLEAR POWER DELIVERIES

Technological condenser VVER 1000

- Manufactured 1 pc.
- Delivery for Yuzhno-Ukrajinska NPP (Ukraine)



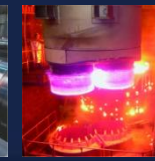


NUCLEAR POWER DELIVERIES

Cooler of drainage VVER 1000

- Manufactured 1 pc.
- Delivery for Yuzhno-Ukrajinska NPP (Ukraine)

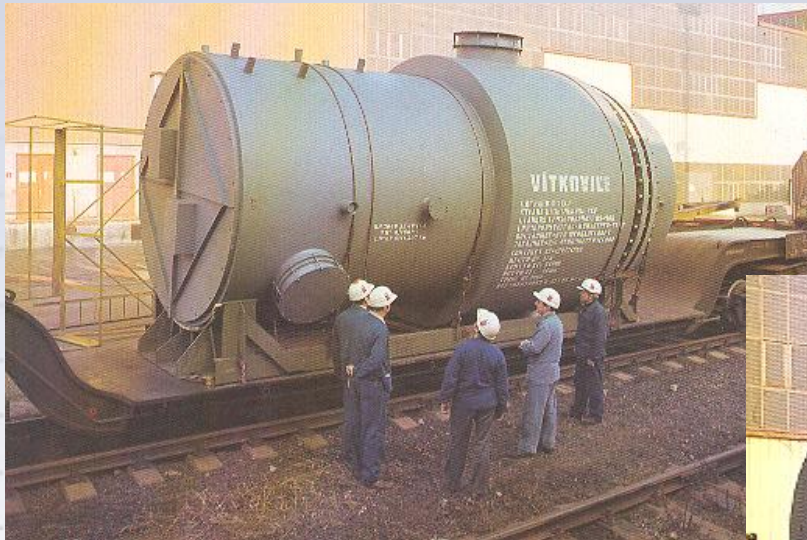


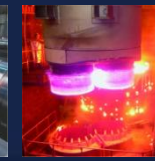


NUCLEAR POWER DELIVERIES

Low pressure heaters NTO 1200 and NTO 3000

- Manufactured 10 sets (5 pcs. of NTO 1200 and 2 pcs. of NTO 3000), it means totally 70 pcs.
- Deliveries for Sojuzglavzagranatomenergo (former Soviet Union)





NUCLEAR POWER DELIVERIES

Replaceable parts of low pressure heater 3000

- Manufacture 7 pcs.
- Deliveries for Yuzhno-Ukrajinska NPP (Ukraine), Kalininska NPP (Rusko) and Rostovska NPP (Rusko)
- Material austenitic steel 018X18H10T.

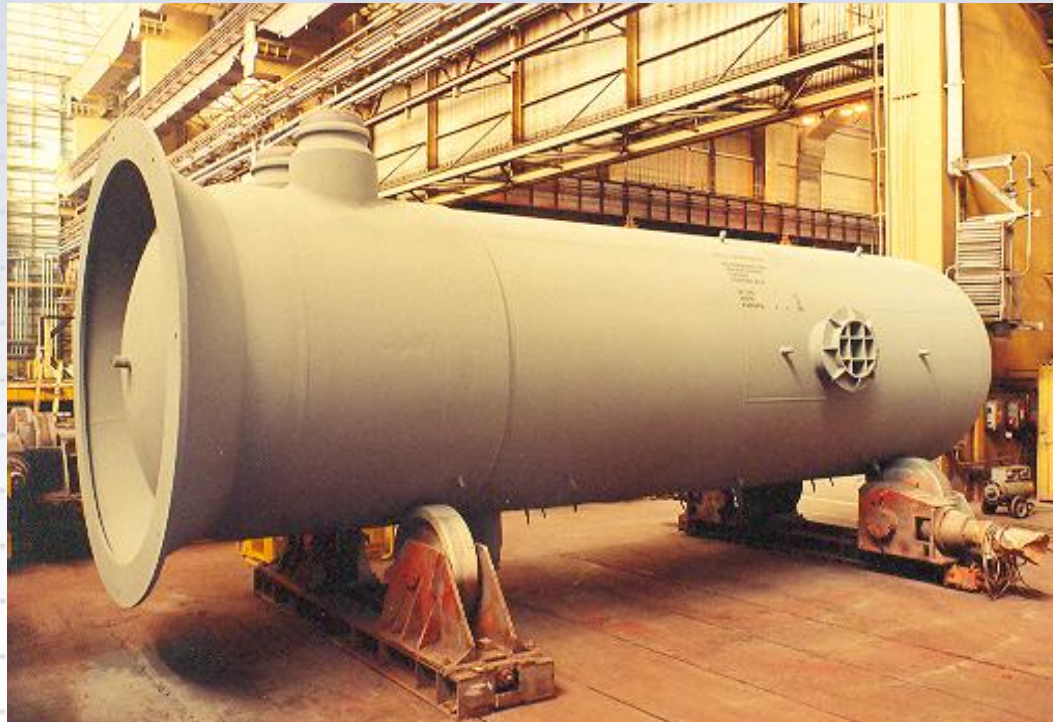




NUCLEAR POWER DELIVERIES

High pressure heater HPH 1000, header type

- Manufactured 4 pcs.
- Deliveries for Yuzhno –Ukrajinska NPP (Ukraine)
- Material austenitic steel 08CH18N10T
- Technical conditions approved by Yuzhno-Ukrajinska NPP, Zaporozhska NPP, NAEK Ukraine, Turboatom Charkov and Ukraine's authorities





NUCLEAR POWER DELIVERIES

Water header VTO 1000

- Manufactured 8 pcs.
- Deliveries for ZIO Podolsk – NPP Tjan-Van (China) and Kudan-Kulam (India)

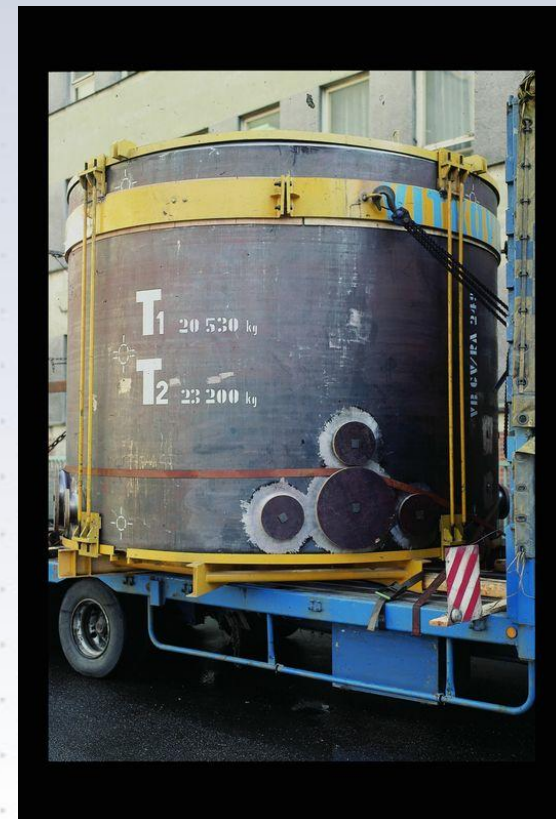


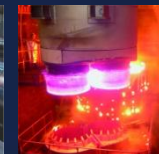
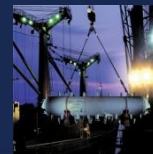


NUCLEAR POWER DELIVERIES

Steam generator AREVA / Framatome

- Manufactured 42 pcs of welded rings for vertical steam generators
- Deliveries for AREVA / Framatome (France)
- Weight up to 65 000 kg
- Material: 18MND5





NUCLEAR POWER DELIVERIES

AREVA / Framatome:

- Year 1993 – produced 9 rings – type VB, VM, VH
- Year 1994 – 3 pcs of subassemblies VB (GV/RA 243 ÷ GV/RA 245)
– 3 pcs of subassemblies TVC (GV/RA 243 ÷ GV/RA 245)
- Year 1994 – produced 18 rings – type VB, VM, VH
- Year 1994 – 6 pcs of subassemblies VB (GV/RA 246 ÷ GV/RA 251)
– 6 pcs of subassemblies TVC (GV/RA 246 ÷ GV/RA 251)
- Year 1995 ÷ 1996 – produced 9 pcs VB, VM, VH
- Year 1995 ÷ 1996 – 3 pcs of subassemblies VB
– 3 pcs of subassemblies VM
- Year 1996 ÷ 1997 – produced 18 pcs of rings type VB, VM, VH

Material delivered by Framatome.

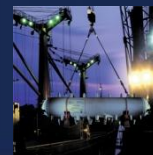


NUCLEAR POWER DELIVERIES

Containers for transportation of radioactive waste

- Manufactured 42 pcs.
- Deliveries for Temelín NPP (Czech republic)

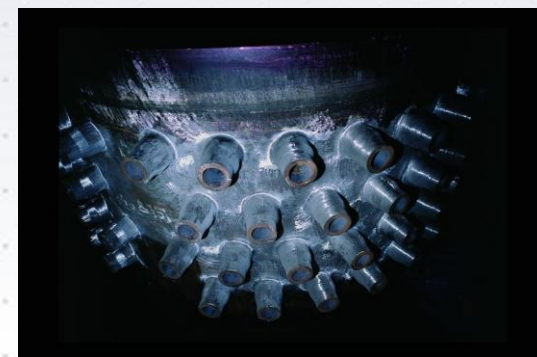


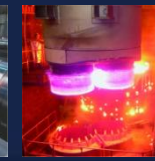


NUCLEAR POWER DELIVERIES

Other equipment for NPP:

- Internals for reactors VVER 1000 – 3 sets.
- Piping and elbows of primary circuit VVER 1000 – 3 sets.
- Internals for reactors VVER 440 – 18 sets.
- Piping and elbows of primary circuit VVER 440 – 18 sets.
- Parts of shaft's protection for reactor VVER 440 – 18 sets.
- Protective shield
- Under trap-door flange
- Removable insulation of reactors upper part
- Steel structure protection
- Lower biological protection
- Upper biological protection
- Heat insulation of reactor's cylindrical part
- Supporting beam
- Heat insulation of beam

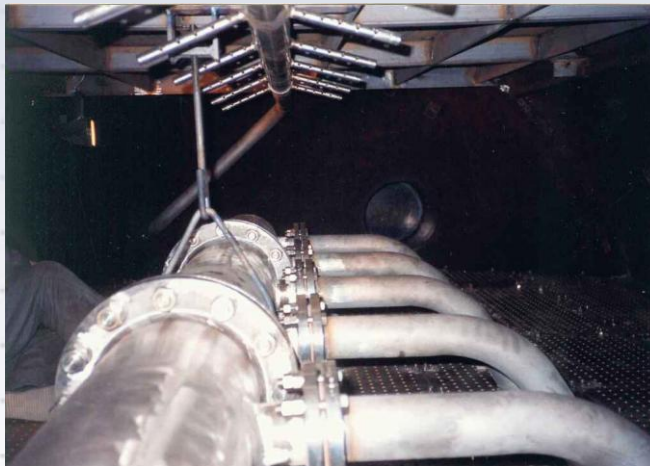


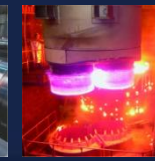


RECONSTRUCTION OF STEAM GENERATOR VVER 1000

In Temelín NPP (Czech Republic) has been performed reconstruction of steam generator at site for increasing of safety, reliability and lifetime in following scope:

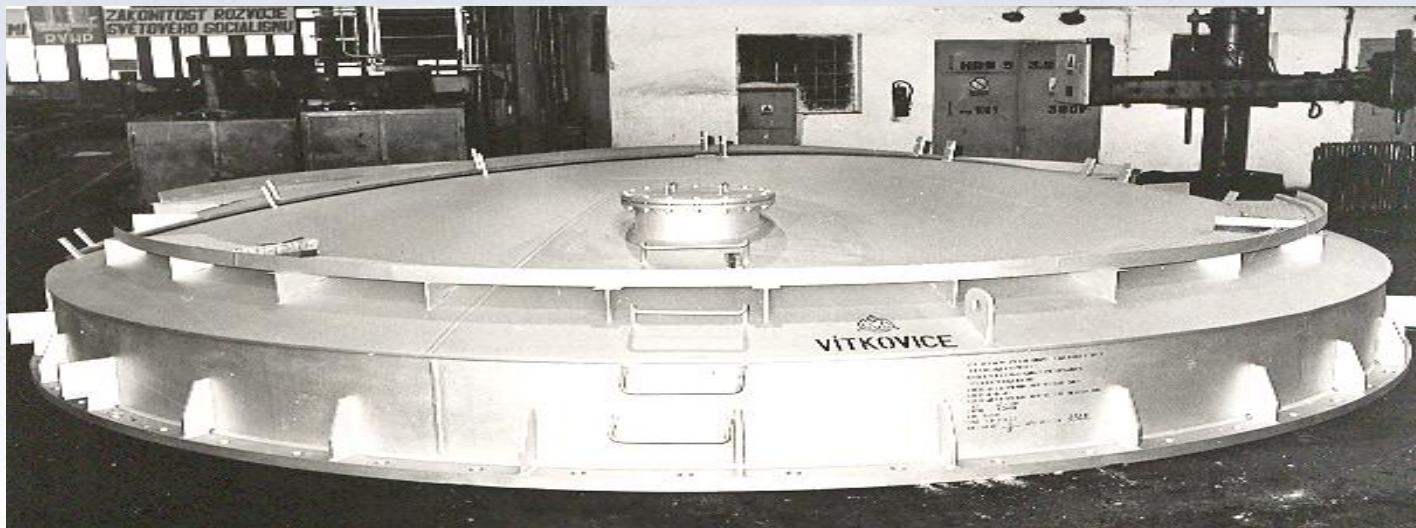
- Reconstruction of feed water systems inside the steam generator
- Reconstruction of separation equipment
- Extension of perforating plate on side of hot collector





DESIGN AND ENGINEERING ACTIVITIES

- Performing activity of main designer for equipment manufactured and delivered to the Czech and Slovak NPP in accordance with legislation of these states.
- Project and design for reconstruction of NP equipment
- Check strength and lifetime calculations
- Analysis of changes' influence towards lifetime and safety of equipment

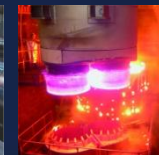




DESIGN AND ENGINEERING ACTIVITIES

- Expert analyses of reasons and consequence of failures and elaboration of recommendations for further operation
- Experimental works in a field of material research
- Solving of secondary circuit's chemical regimes for steam generator VVER 440 and VVER 1000 (increase of pH)
- Project and delivery of modified covers for primary circuit's collectors PG VVER 440
- Project of exchange of nickel gaskets by graphite gaskets PG VVER 440 and VVER 1000

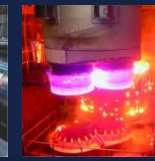




VÍTKOVICE HEAVY MACHINERY a. s. NUCLEAR POWER DELIVERIES

VÍTKOVICE HEAVY MACHINERY a. s. is traditional producer of forgings. The heavy machined forgings traditionally constitute the basic components of the Steam Generators, Pressurizers or Low and High Pressure Heaters. We have done the hundreds of Shells, Bottoms, Collectors, Transition Cones, Tube Sheets, Covers, Flanges, Tube Plates, Test Plates, Support Rings, Heads, Nozzles and many other parts in outstanding quality during the last thirty years.

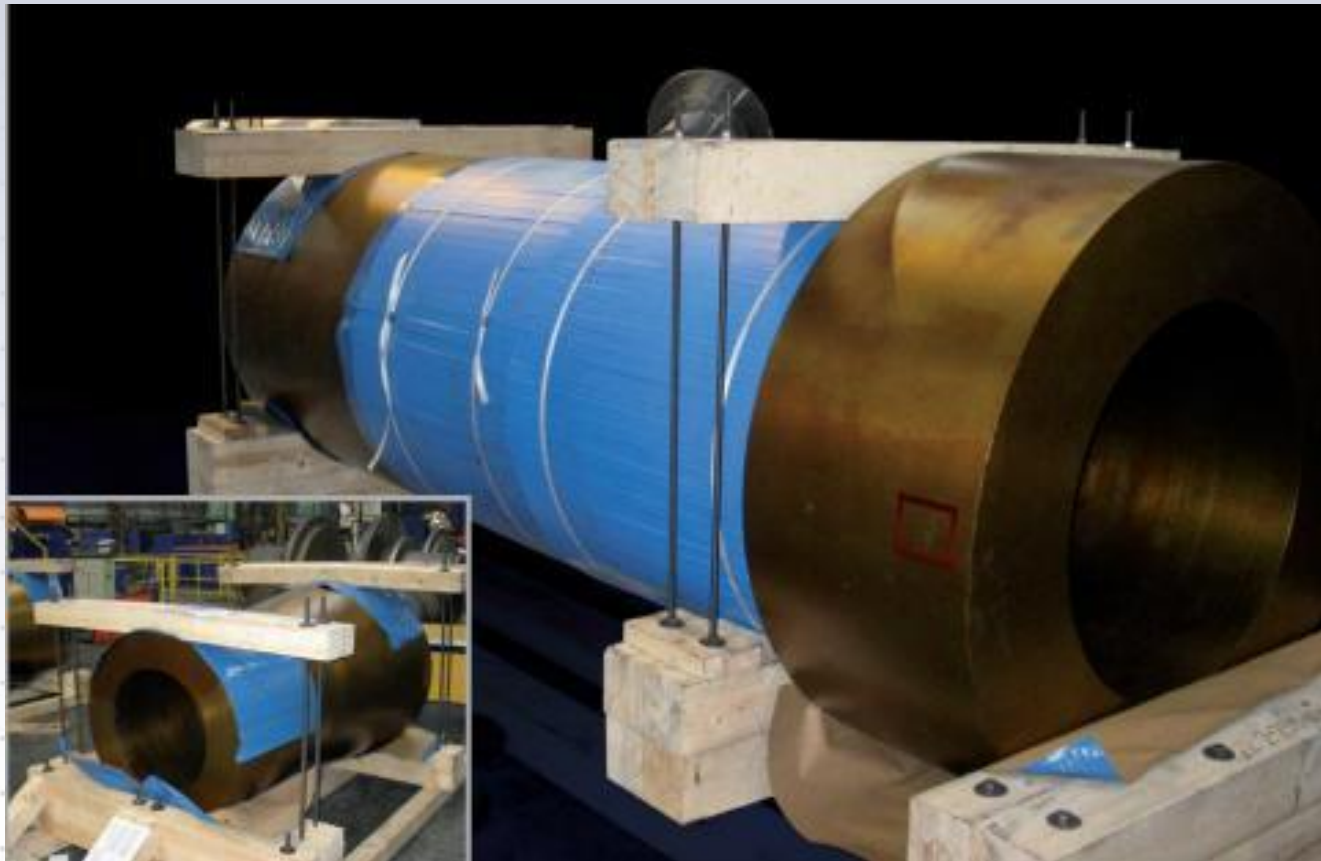
In close cooperation with the research institutes and universities VÍTKOVICE HEAVY MACHINERY a. s. play an active role in the field of new technologies development and keep in with the state-of-the-art production trends.



VÍTKOVICE HEAVY MACHINERY a. s. NUCLEAR POWER DELIVERIES

Collector Body and Collector Flange

- Manufactured and delivered by VÍTKOVICE HEAVY MACHINERY a. s.
- Delivery for AEM Technology, Russia

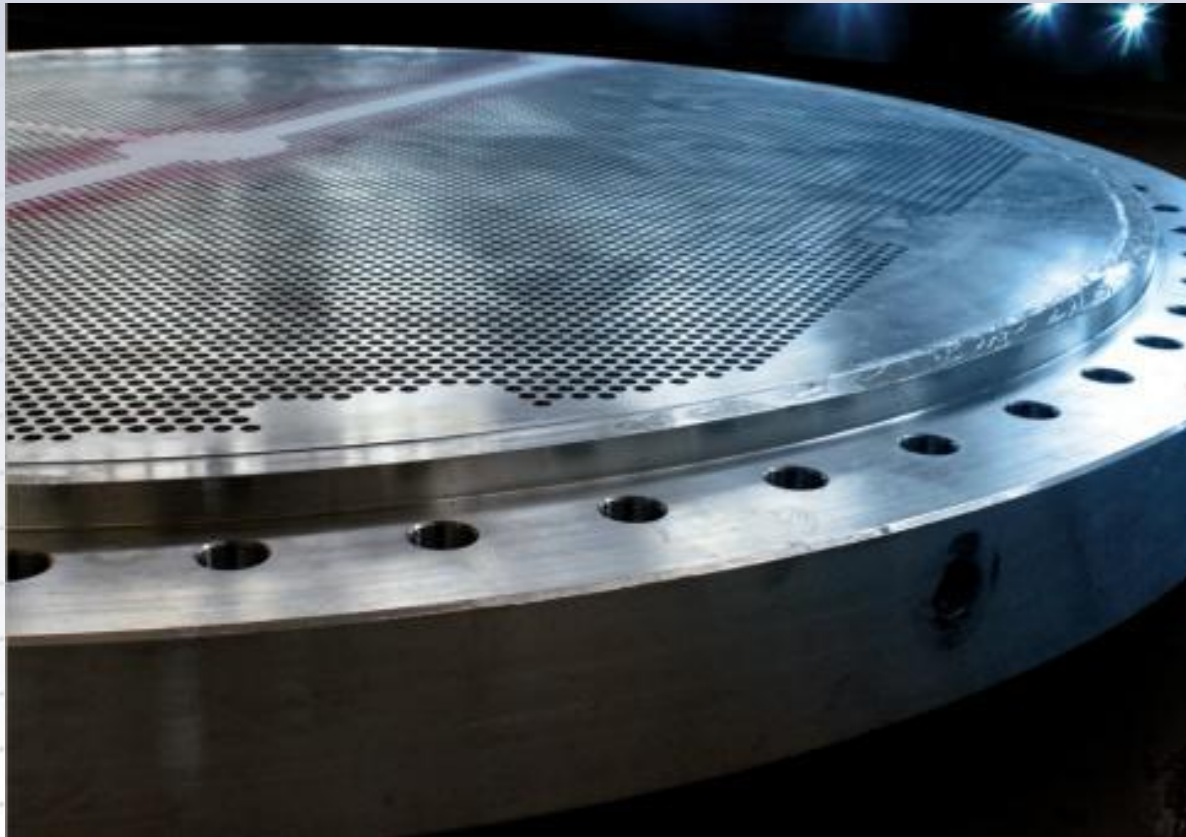


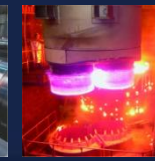


VÍTKOVICE HEAVY MACHINERY a. s. NUCLEAR POWER DELIVERIES

Precise drilled holes in Tube sheet

- Manufactured and delivered by VÍTKOVICE HEAVY MACHINERY a. s.
- Delivery for ZIOMAR, Russia

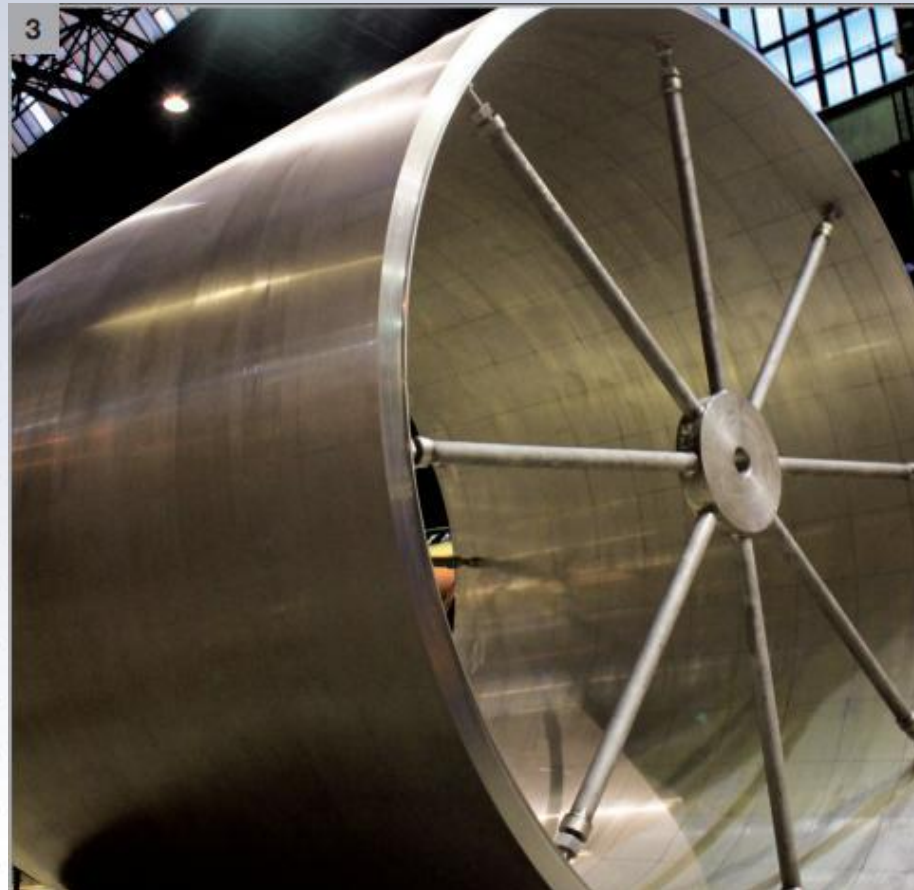


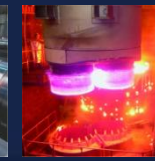


VÍTKOVICE HEAVY MACHINERY a. s. NUCLEAR POWER DELIVERIES

Forged thin-walled Steam Generator Shell

- Manufactured and delivered by VÍTKOVICE HEAVY MACHINERY a. s.
- Delivery for India





ACTUAL ACTIVITIES

Finishing of 3rd and 4th block of Mochovce NPP

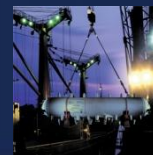
We ensure finishing of the 3rd and 4th block of Mochovce NPP (NPRVVER 440) since 2009. It is based on the agreement with ŠKODA NUCLEAR MACHINERY. These activities are connected with primary circuit's components delivered by VÍTKOVICE in the 90's: steam generators and volume compensators. Be specific, we perform: revision of condition, design adjustment, participation and control during assembly and commissioning of the both blocks.





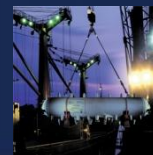
ACTUAL ACTIVITIES





LIST OF CERTIFICATES

STANDARD	SCOPE OF ACTIVITY	CERTIFICATE AGENCY	CERTIFICATE No.	EXPIRY DATE
EN ISO 9001:2008	Establishing and Applying a Quality Management System for Design, Manufacturing, Installation and Servicing of Nuclear Components, Steam Boilers, Pressure Vessels, Piping, Storage Tanks, Welded Parts, Equipment for Metallurgy	TÜV NORD CERT GmbH	04 100 049063	October 31, 2013
ASME CODE Section VIII, Div. 1	Construction, Manufacturing and Field Sites of Pressure Vessels and their Parts (Stamp "U")	ASME	33,299	May 29, 2014
ASME CODE Section VIII, Div. 2	Construction, Manufacturing and Field Sites of Pressure Vessels and their Parts (Stamp "U2")	ASME	33,300	May 29, 2014
ASME CODE Section I	Construction, Manufacturing of Boilers (Stamp "S")	ASME	33,298	May 29, 2014



LIST OF CERTIFICATES

Quality assurance system according to EN ISO 9001:

CERTIFICATE

Management system as per
EN ISO 9001 : 2008

In accordance with TÜV NORD CERT procedures, it is hereby certified that

VÍTKOVICE POWER ENGINEERING a.s.
Ruská ul. 1142/30
706 00 Ostrava - Vítkovice
Czech Republic

applies a management system in line with the above standard for the following
scope

**Design, production and installation of steel structures, bridges and welded parts.
Design, production, installation and service of equipment for the power engineering,
nuclear power engineering, ecology, petrochemistry and metallurgy, pipelines, parts
of turbines, pressure vessels and membrane walls. Design, production, installation
of tanks, enameled and other surface finished tanks, hot-dip galvanizing, thermal
spraying of metal and ceramic coatings. Realization of large investment projects
for the power engineering, ecology, petrochemistry and metallurgy.**

Certificate Registration No. 04 100 049063
Audit Report No. 624 523/300

Valid until 2013-10-31
Initial certification 2004-11-19


Certification Body
at TÜV NORD CERT GmbH

Praha, 2010-11-01

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is
subject to regular surveillance audits.

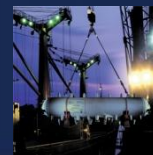
TÜV NORD CERT GmbH

Langemarckstrasse 20

45141 Essen

www.tuev-nord-cert.com





VÍTKOVICE

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