



ROSATOM

STATE ATOMIC ENERGY CORPORATION ROSATOM

ATOMENERGOMASH NPP Manufacturing Experience: Nuclear Industry Suppliers Forum 2019

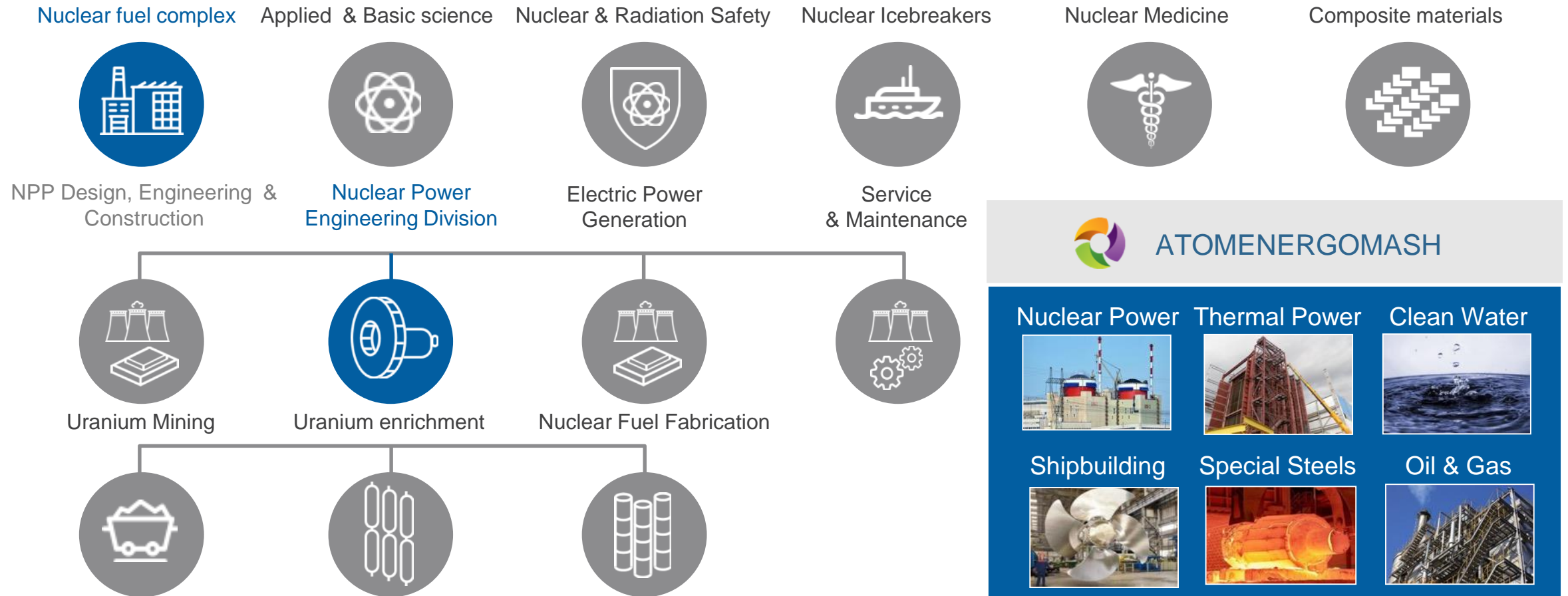
October 8th, 2019

Cairo, Egypt

ATOMENERGOMASH IN THE STRUCTURE OF RUSSIAN NUCLEAR INDUSTRY



Russian State Atomic Corporation – Global Leader in technologies, skills and competencies, capable to provide cutting-edge industry solutions



The content of this presentation is for discussion purposes only, shall not be considered as an offer and doesn't lead to any obligations to Rosatom State Corporation. Rosatom disclaims all responsibility for any and all mistakes, quality and completeness of the information.

POWER ENGINEERING DIVISION OF ROSATOM

AEM Group integrates

➤ **20** Companies in Russia, Czech, Hungary, Ukraine

- Leading engineering company in Russia
- Provider of equipment package supply
- Solutions for nuclear, thermal power, gas and petrochemical industries

Key Performance Data



~ 30 %
of Russian Power Generation Equipment Market

~ 40 %
of Thermal Power Plants in Russia

~ 14 %
of Global Nuclear Power Market



18 000
High Qualified Employees



USD 9,5bln.
Order Backlog

Workflow process

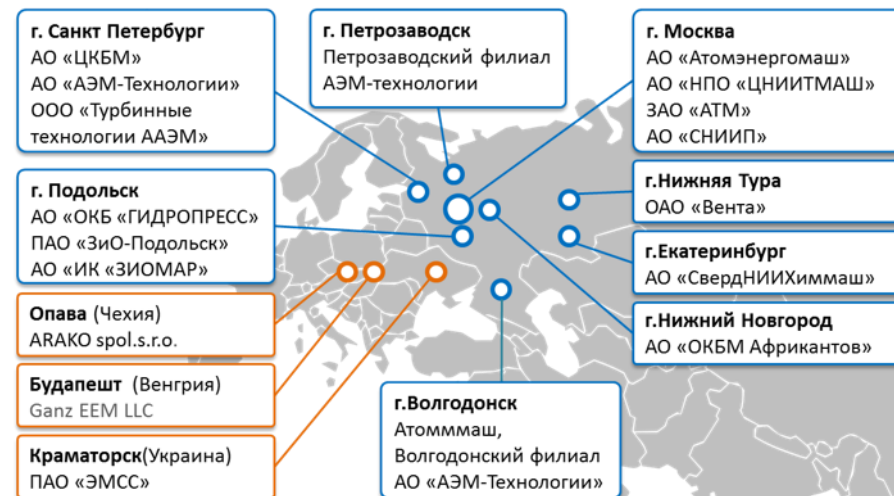
Design & Engineering

Manufacturing

Supply

Installation and commissioning

Maintenance & Service



 - Russian subsidiaries

 - AEM European subsidiaries

POWER EQUIPMENT: UNIVERSAL COMPETENCES – MULTIPLE APPLICATIONS

NUCLEAR POWER GENERATION EQUIPMENT

- Reactor vessel equipment
- Steam generators (up to 1200 MW)
- Turbine island equipment (up to 1200 MW)
- Pumps (incl. main circulation pump)
- Transportation/lifting equipment
- Control and measurement equipment
- Auxiliary equipment
- Equipment for NRW and SNF

THERMAL POWER GENERATION EQUIPMENT

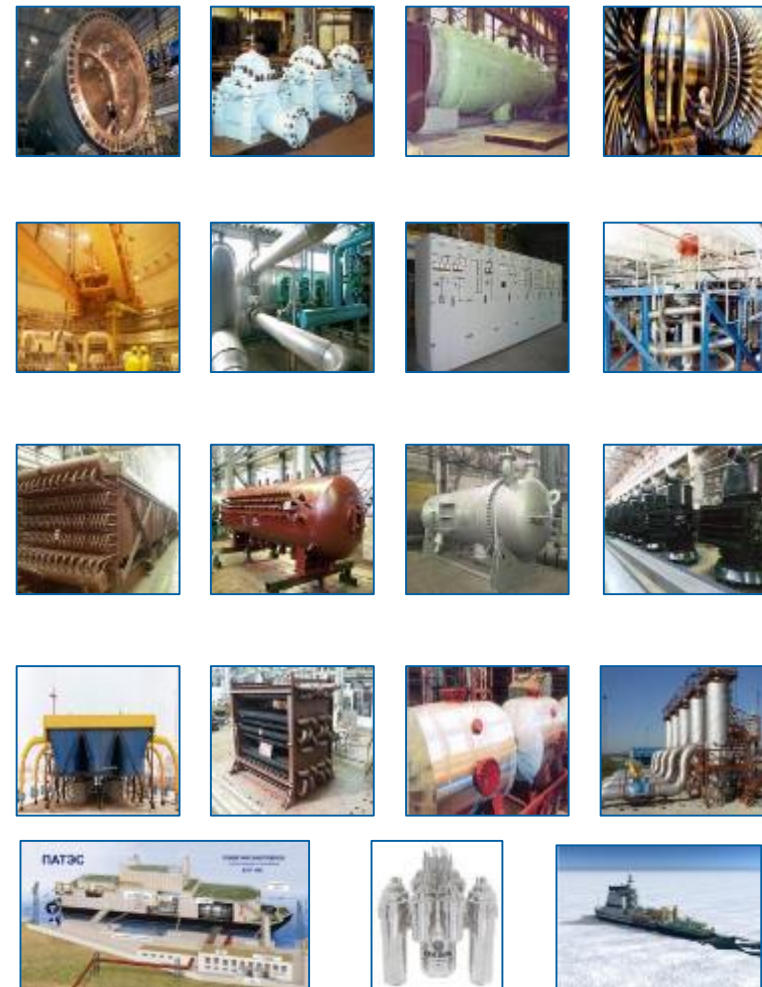
- Boilers, HRSG (up to 800 MW)
- Heat-exchangers
- Auxiliary equipment

EQUIPMENT FOR OIL&GAS INDUSTRY

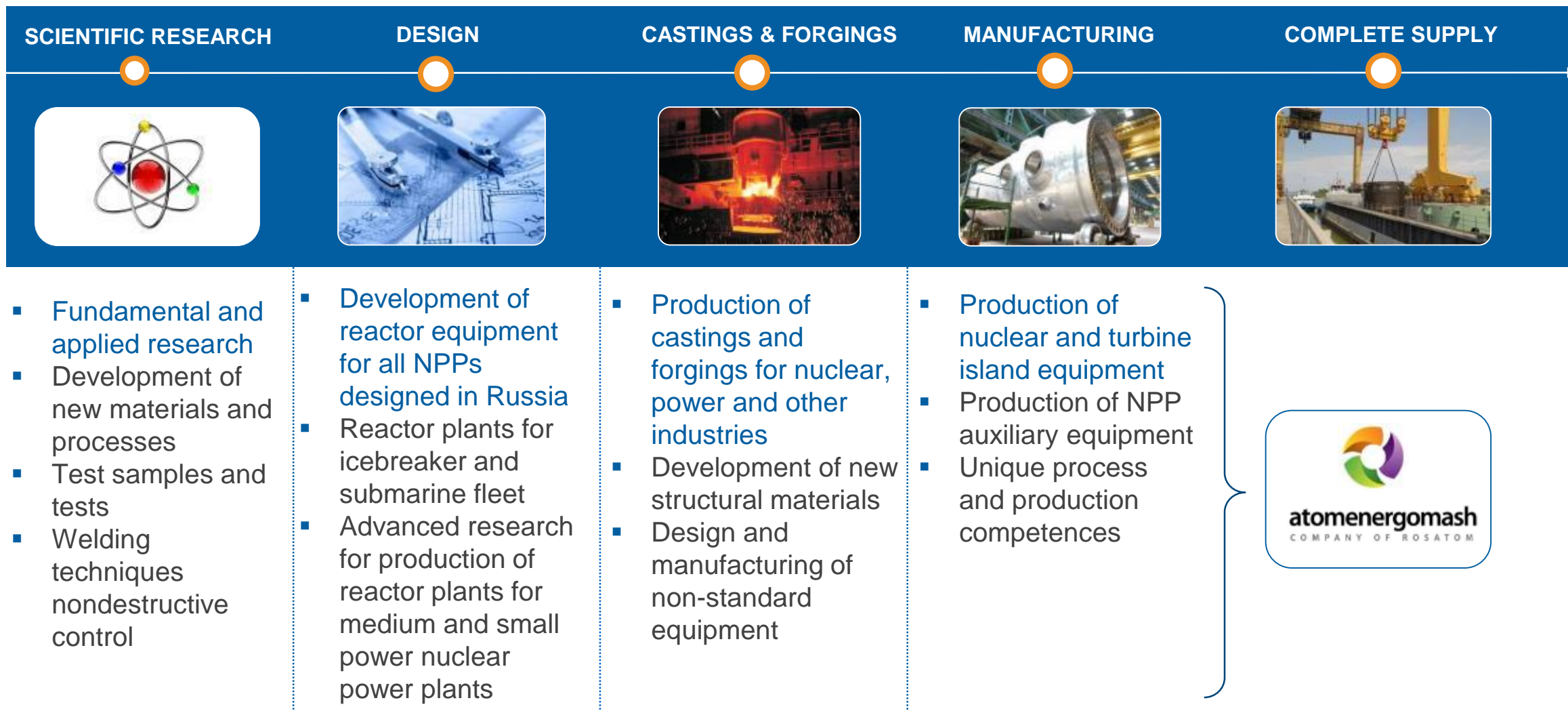
- Air-cooling units and reservoir equipment
- Auxiliary equipment

SPECIAL STEELS

- Castings (up to 415 tones) and forgings (up to 250 tones)

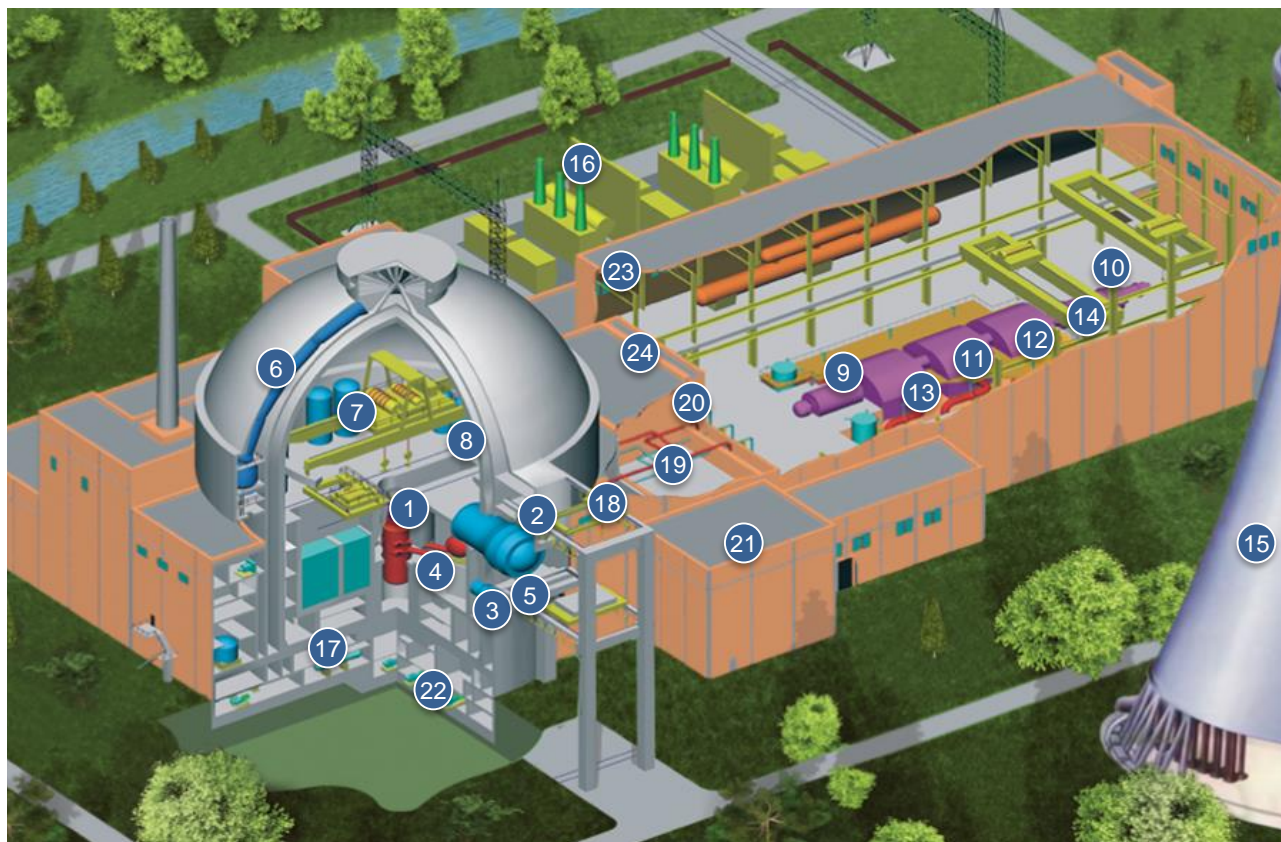


AEM: COMPLETE PRODUCTION CHAIN



CORE EQUIPMENT AND BALANCE OF PLANT

Complete manufacturing and delivery of Nuclear and Turbines Island equipment for Russian design NPP



| Reactor building | Power output |
|---|---|
| 1. Reactor vessel, components | 17. High voltage equipment |
| 2. Steam generators | Auxiliaries and Balance of Plant equipment |
| 3. Main coolant pump | |
| 4. Main circulation piping | |
| 5. Piping of the emergency core cooling system, pressurizer and planned and emergency cooling | |
| 6. Accumulator | |
| 7. Fuel handling machine | 18. Pump equipment |
| Turbine building | |
| 9. Turbine | 19. Accessories |
| 10. Turbine-generator | 20. Heat-exchange equipment |
| 11. Separator-reheater | 21. Piping |
| 12. High pressure heater | 22. I & C |
| 13. Low pressure heater | 23. Equipment for radioactive wastes and spent nuclear fuel |
| Cooling systems | |
| 15. Cooling towers | 24. Fans |
| | 25. Various application filters |
| | 26. High voltage equipment |

LICENSING AND CERTIFICATION IN THE GLOBAL MARKET

Successful licensing by national regulatory bodies and manufactured equipment certification are essential for work in the foreign markets



NATIONAL REGULATORS REQUIREMENTS

- Radiation and Nuclear Safety Authority in Finland (STUK)
- Atomic Energy Regulatory Board in India (AERB)
- National Nuclear Security Administration of China (NNSA)
- Turkish Atomic Energy Authority (TAEK)
- Iran Nuclear Regulatory Authority (INRA)
- The Hungarian Atomic Energy Authority (HAEA)
- Rostechнадзор, Russia

INTERNATIONAL CERTIFICATION

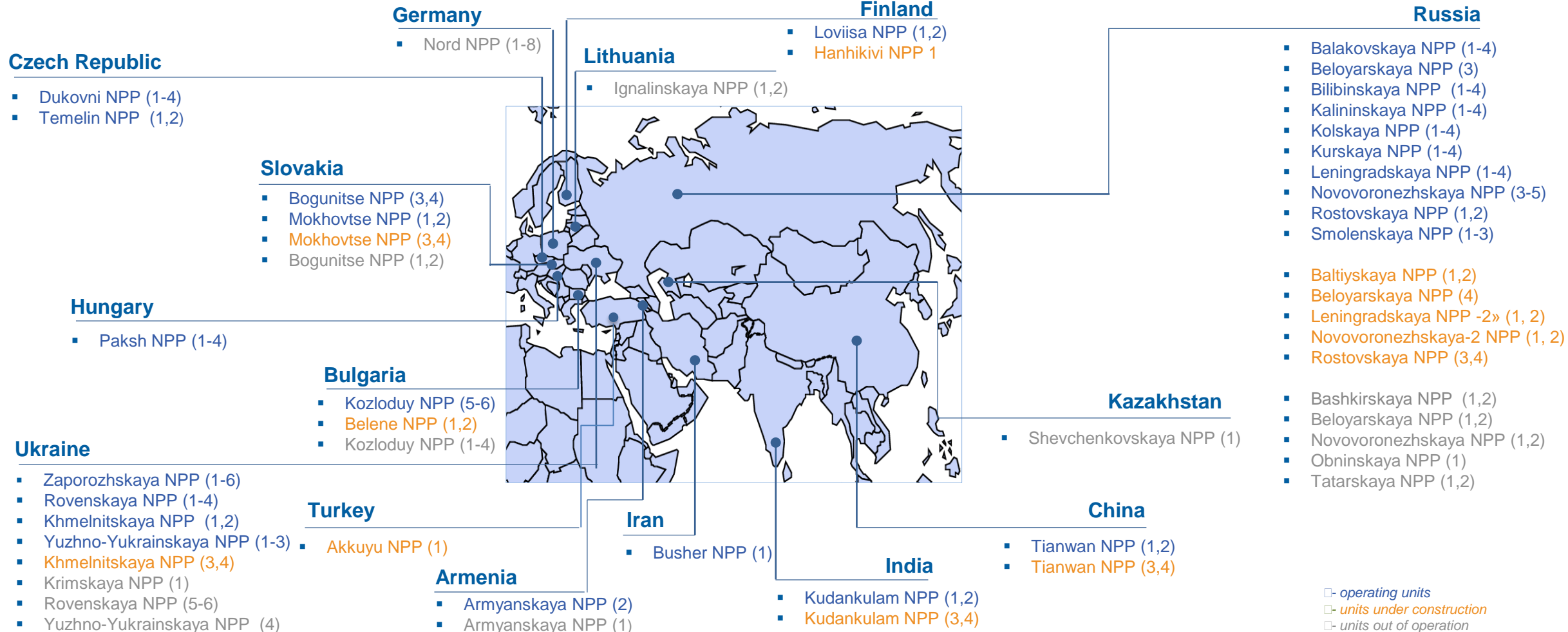


DET **NORSKE**



RUSSIAN AND OVERSEAS NUCLEAR PROJECTS

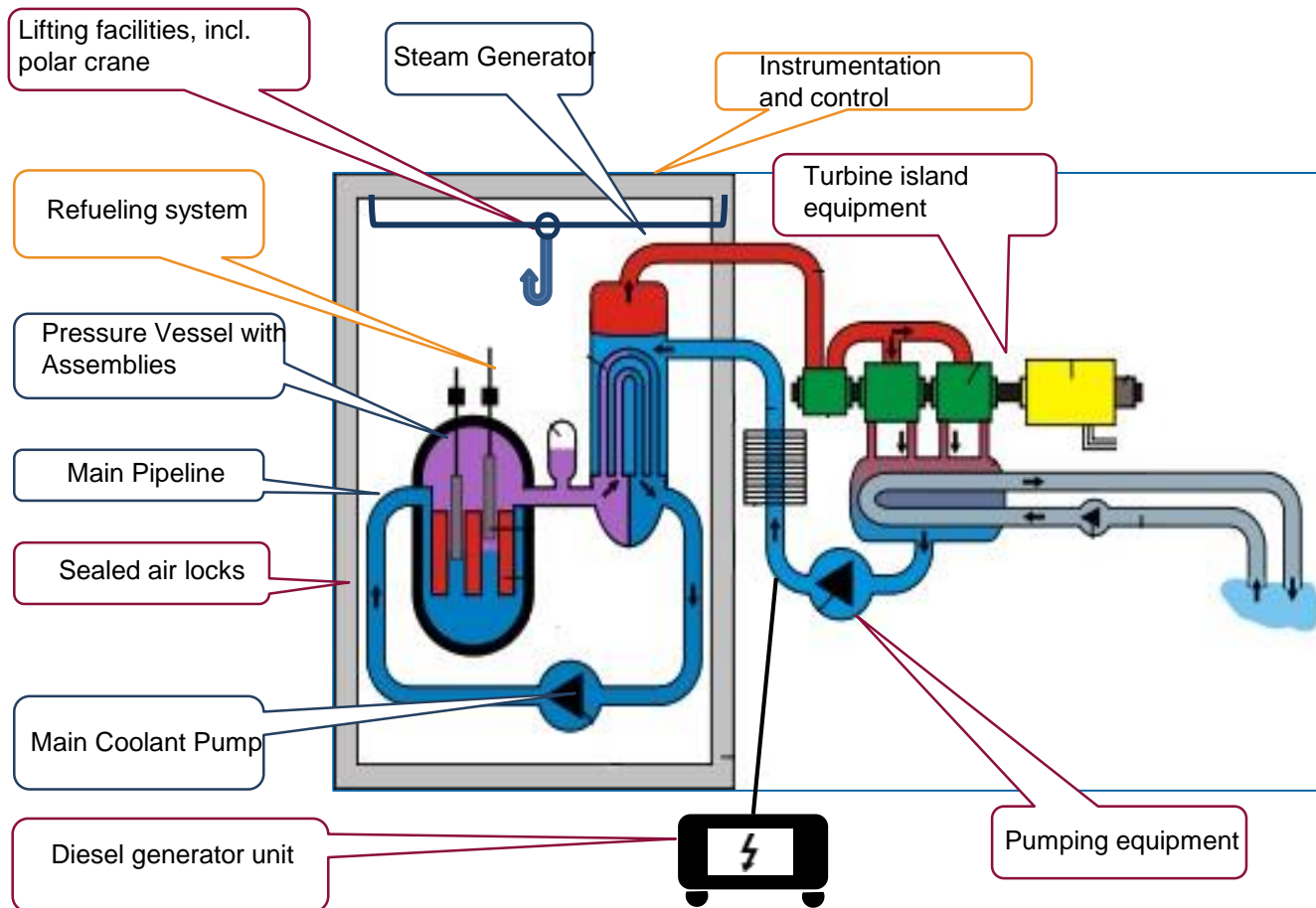
NPP'S FOOTPRINT OF ATOMENERGOMASH



The content of this presentation is for discussion purposes only, shall not be considered as an offer and doesn't lead to any obligations to Rosatom State Corporation. Rosatom disclaims all responsibility for any and all mistakes, quality and completeness of the information.

FOREIGN OEMS' OPPORTUNITIES IN SUPPLY FOR ROSATOM NUCLEAR FACILITIES

Main long-lead equipment for NPP



Supplied by Rosatom companies

May be supplied by other suppliers

May partially be supplied by other suppliers

Other equipment

- Equipment for radioactive and waste handling
- Facilities to handle spent nuclear fuel

- Ventilation equipment
- Electrical equipment, cables and Instrumentation
- Cranes facilities
- Compressor equipment
- Vessels
- Heat exchangers equipment
- Valves

REQUIREMENTS FOR PARTICIPANTS OF THE PROCUREMENT, CONTRACTORS, MANUFACTURERS

For manufacturers of equipment related to the important safety elements of nuclear facilities 1, 2, 3 safety classes in accordance with the federal regulations and the use of atomic energy, including long-lead equipment, the customer makes the compulsive requirements in terms of availability experience and the current quality management system (management, quality assurance and control).

In the documentation for the procurement of the standard shall be indicated, which shall conform to the quality management system or should be set out the basic requirements for such a system.



SUPPLY CONTRACT AWARD CRITERIA

In the course of supplier selection Atomenergomash used the following criteria for their assessment

- Experience of manufacturing of equipment related to elements of nuclear installations important for safety – of 1, 2, 3 safety class according to federal regulations in the field of nuclear power as well as equipment subject to production control and compliance assessment through acceptance according to inspection plans, including long-lead equipment;
- Experience of production and supply of equipment to be contracted;
- Price of equipment, work and services;
- Payment conditions;
- Period of supply of equipment, execution of work and services;
- Functional and quality features of equipment;
- Quality of technical proposal of the participant of procurement procedure;
- Qualification of the participant and its subcontractors, including:
 - availability of material and technical resources / availability of human resources;
 - experience / business reputation;
 - availability and the level of implementation of Quality management system



ROSATOM



atomenergomash

Thank You for Attention!

Address: 115184, Russia, Moscow,
Ozerkovskaya Nab. 28, str. 3
Tel.: +7(495) 668-20-93
Fax: + 7 (495) 668-20-95
E-mail: aem@aem-group.ru