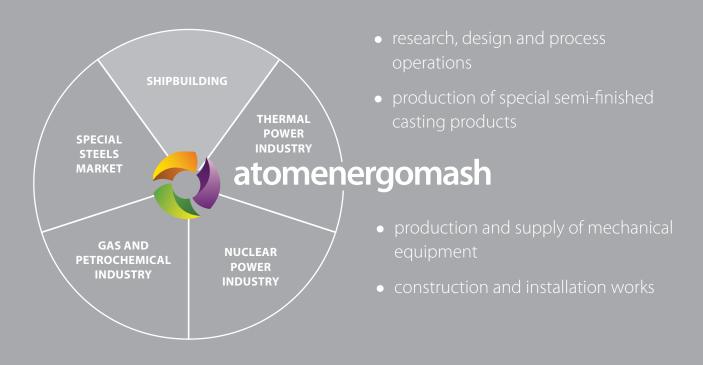
Solutions for the Shipbuilding Sector





ATOMENERGOMASHGROUP OF COMPANIES

Atomenergomash JSC is a machine building division of Rosatom State Atomic Energy Corporation. It is one of the largest power engineering holdings in Russia, offering its clients the complete range of solutions in equipment design, production and supply for nuclear and thermal power plants, the gas and petrochemical industry, and the shipbuilding and wind energy industries.



- over 30 companies in Russia and abroad
- 21.000 people employed by AEM
- 20% of the domestic power engineering market
- AEM equipment is operated in over 20 countries worldwide
- 100% of navy ships running on nuclear power are equipped with reactors manufactured by AEM enterprises

PRODUCTS FOR THE NUCLEAR-POWERED FLEET

Atomenergomash is Russia's leading designer and manufacturer of reactor plants. The development of the Russian nuclear-powered fleet is inevitably linked to AEM companies. Our long standing experience lets us develop unique reactor plants for various-purpose vessels.

Atomenergomash companies are the primary designers of reactor plants for navy ships and vessel reactor plants for icebreakers.

Nuclear-powered Marine reactor plants icebreaker fleet 100% of navy ships running Russian nuclearon nuclear power are powered icebreakers equipped with reactors manufactured are equipped with by AEM companies reactors designed and manufactured by AEM reactors for navy ships facilities* have been manufactured and put in service The total running time of reactors The total running time of the manufactured reactors is 365 reactor-years. manufactured for navy ships is 6500 reactor-vears

^{*} Including those taken out service.



MODIFICATIONS OF REACTOR PLANTS MANUFACTURED BY AEM



ABV-6M Thermal power: 38 MW

 Unified reactor plants with integral reactors and 100% natural circulation in the primary circuit for onshore and offshore nuclear power plants



KLT-40S

Thermal power: 150 MW

 Commercial modular reactors of nuclear icebreakers, marine fleet vessels and offshore nuclear power plants



RITM-200

Thermal power: 175 MW

 Integral reactor with forced circulation for universal nuclear-powered icebreakers and offshore nuclear power plants

KEY EQUIPMENT FOR SHIPBUILDING

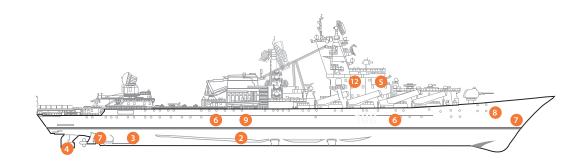
Atomenergomash Group's experience and competences allow it to meet the highest quality standards. Since the early 1950's, AEM companies have been the leaders in domestic design and production of reactors for navy and icebreaker fleets. Today, AEM is capable of producing not only power plants, but also other equipment for the shipbuilding industry. By virtue of its smooth production process, from design to supply, AEM offers a wide range of solutions to meet customers' needs.

- Reactor plant (development and integrated supply)
- 2 Heat exchange equipment
- 3 Shaft lines with accessories (supplies of materials, manufacture of products and components)
- 4 Steering gear (supplies of materials and manufacture of products)
- Dosimetry and radiation monitoring systems
- 6 Pumping equipment for ship systems

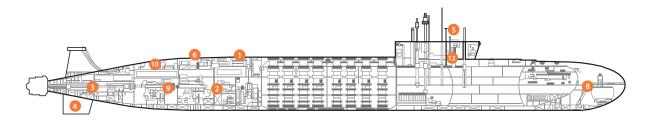
- 7 Hull castings
- 8 Ground gear (supplies of materials and manufacture of products)
- 9 Valves for various ship systems
- Filtration, ventilation and air conditioning equipment
- 11 Hoisting equipment
- 12 Integrated multi-functional control systems



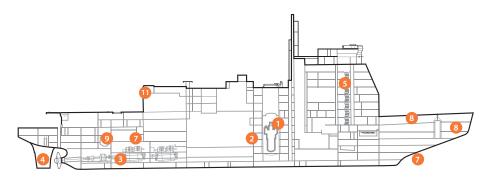
Surface navy ships



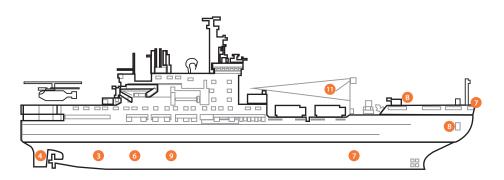
Navy submarines



Icebreaker fleet



Merchant marine fleet



PRODUCTION CAPABILITIES

AEM has the equipment and competences to perform all process operations, from foundry and blanking production to testing and supply of the finished products.

- Forging
- Foundry
- Thermal process
- Welding
- Mechanical assembly
- Machining
- ISO Standards

Production Capacities

Simultaneous manufacturing of up to 4–5 sets of equipment for nuclear power plants

- Manufacturing of equipment for generation of up to 3 GW per year under thermal power industry programs
- Large valves, towers and reactors for the gas and petrochemical industry, up to 1300 tons
- Production capacities for tube fins installation –
 7 to 8 thou. tons per year
- Up to 60,000 tons of cast iron, steel and non-ferrous alloy castings per year

Process Capabilities

- Steel forged billets of carbon, alloyed, stainless and other steel grades of any size with full quality control in accordance with specifications and standards
- Ingots of structural and high alloyed steel grades, up to 415 tons
- Cast iron castings weighing up to 140 tons and steel castings weighing up to 250 tons
- All types of welding of stainless, carbon steel, ferrous metals and titanium alloys up to 9 m in diameter, up to 100 m in length and weighing up to 1200 tons
- Charging cranes and general-purpose cranes with a capacity of up to 600 tons
- Unique double action press with amplification, 15,000 tons
- Machining, 6 x 14 m and weighing up to 350 tons







Atomenergomash — state of the art technologies for modern shipbuilding

TRANSPORT CAPABILITIES

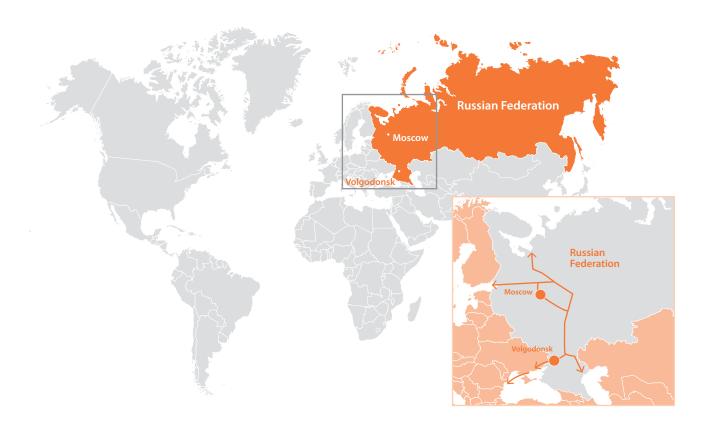
- Proprietary specialized berth for heavy loads with cranes having an overall load capacity of 1350 tons, capable of receiving river-marine type vessels with a load capacity of up to 5000 tons. The Volgodonsk port is connected via a waterway to five seas – the White Sea and Baltic Sea to the North, the Caspian Sea to the East, and the Azov and Black Sea to the South.
- Possibility of product shipment via railway or trucks



Loading of oversize equipment at the specialized mooring berth



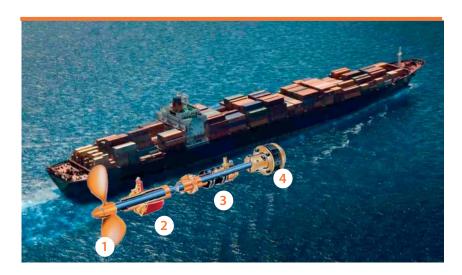
- 1 Specialized mooring berth
- 2 Production site



SPECIAL AND SEMI-FINISHED CASTINGS

Shipbuilding products

- Steel forged semi-finished products of carbon, alloyed, stainless and other steel grades are available in any size
- Ingots of structural and high alloyed steel grades, up to 415 tons
- Stamped sheet semi-finished products of different shapes (vessel heads, splash boards, collars, troughs, etc.)

























PRODUCTS AND EQUIPMENT

Deck Machinery



Filtering equipment



Pumping equipment



SHAFT LINES AND PROPELLERS

Propellers



Propeller blades for icebreaker LK-25





Semi-finished blade of right-hand propeller, LK-60

Shaft lines and stern gear



Rudder stock UMP f. 15-990 z. 554034



Line shaft



Mold casting



Stern post casting Part No. 2 1-15206 LK-60



Portside and starboard brackets, 1-15122 LK-60



Stern post weld-in piece, 2-15201 LK-60

HEAT EXCHANGE EQUIPMENT







ONBOARD VALVES





10

SYSTEMS AND RADIOMETRIC COMPLEXES

Shipbuilding products

The multi-functional information and control system is designed for monitoring the radiation and chemical content to ensure safe operation and to exercise control over ship damage.



Radiometric complex for mobile objects

Dosimetry measurement facility KDU-8,

This facility is intended for continuous automatic monitoring over radiation; it also serves as an alarm and hint-signal generator in case of deviation from normal conditions by means of collecting and processing information from detection modules and devices.

The KDU-8 equipment set is a generation IV multi-functional tool configured for different mobile objects of the customer, with the required number and combination of modules and equipment.











QUALITY MANAGEMENT SYSTEM

Product safety and quality is a priority for the Atomenergomash Group

- Atomenergomash facilities have over 50 years of experience in manufacturing and supplying shipbuilding equipment
- The quality control system is similar to that applied during NPP construction; there is an independent acceptance service and supervision authority
- The main factor of competitive power in the shipbuilding industry is production efficiency
- Atomenergomash facilities are certified for compliance with the ISO 9001 standard
- Key Atomenergomash manufacturing facilities hold the Certificate of Manufacturer's Recognition, issued by the Russian Maritime Register of Shipping
- Atomenergomash facilities are certified and hold licenses of numerous Russian and foreign companies











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