SHIPBUILDING & SHIPREPAIR
TECHNOLOGY CENTER

TECHNOLOGY DESIGN AND ENGINEERING PRODUCTION SERVICE

JOINT STOCK CORPORATION

SHIPBUILDING & SHIPREPAIR

TECHNOLOGY CENTER

The mission of JSC SSTC is to cover current demands of Russian shipbuilding industry and foreign customers in technologies, process equipment, jigs and fixtures, test benches and facilities for production of competitive marine equipment as well as for maintenance and repair of existing ships and vessels of various types and purposes.

JSC “Shipbuilding & Shiprepair Technology Center” was founded in 1939 and today is a leading design and engineering center of Russian shipbuilding and ship repair industries.

JSC SSTC provides complete cycle of works from generation of creative ideas to their final implementation into advanced innovative shipbuilding and engineering products.

Main activities:

- Comprehensive research in the field of shipbuilding, ship repair and engineering technologies within the framework of federal target programs and contracts with industrial companies
- Development of advanced technologies for shipbuilding, ship repair and other industry branches
- Engineering support for design, construction and repair of ships of all classes and purposes, automation of preproduction engineering at shipyards and dockyards
- Design, modernization and retooling of shipyards and other industrial enterprises
- Design and engineering support for onshore infrastructure, exploitation, maintenance and repair of ships and vessels
- Design and production of process equipment, jigs and fixtures for shipyards, dockyards and mechanical engineering enterprises
- Design of repair documentation for ships of various types and purposes
- Design and production of shipborne pipeline valves and fittings for all types of ships, vessels, deep-sea vehicles and multipurpose industrial equipment
- Design of fishing, research and other vessels
- Economy, price formation, labour intensiveness, norm-setting and technical-economical expert appraisal of labour coefficients and prices for construction, repair, maintenance and disposal of ships, vessels and marine equipment
- Development and implementation of technologies for disposal of nuclear-powered submarines, ships and vessels
- Development of technologies for treatment of spent nuclear fuel, solid and liquid nuclear radioactive wastes
- Design of facilities for long-term storage of reactor blocks of nuclear powered submarines / service vessels subjected for disposal
- Development and update of documentation standardizing shipbuilding and ship repair technologies

BACKGROUND

By decree of the Council of People's Commissars of the USSR dated August 23, 1939 and by the order of People's Commissar for Shipbuilding Industry No. 235 dated August 26, 1939, the All-Union Trust "OrgSudoProm" was established, which nowadays is named Joint-Stock Corporation "Shipbuilding & Shiprepair Technology Center."

August 26, 1939	OrgSudoProm Union Trust was established
June 29, 1948	OrgSudoProm Union Trust was re-organized into Central Research Institute of Advanced Shipbuilding Technology (TsNII-138)
1957 till 1963	Branches of the Institute were established in Nikolaev, Khabarovsk, Sevastopol, Gorky (now Nizhniy Novgorod)
December 1959	The Nikolaev Branch incorporated a mechanical repair plant which subsequently became the base for welding and gas-cutting equipment production plant named Kristall
April 25, 1963	By decree of the Presidium of the Supreme Soviet of the USSR the Institute was awarded the Red Banner of Labour for significant contribution to the development of shipbuilding industry and for assistance to shipbuilding companies in increasing their technical level of production
March 1965	Institute incorporated Leningrad ship repair plant Pella
September 1965	Institute incorporated Special Design Bureau for Plastics in Feodosia and its Novinka pilot-production plant for plastic shipbuilding
January 31, 1966	By order of Ministry of Shipbuilding Industry No. 0056, the Institute was renamed Central Research Institute of Shipbuilding Technology (CRIST)
December 1968	Institute incorporated Leningrad factory Petrozavod and Svir shipyard
August 27, 1969	Research-and-production association "Ritm," the first association in shipbuilding industry, was established on the base of CRIST and its branches and pilot-production plants
April 22, 1993	RPA Ritm was transformed into the State Enterprise "Central Research Institute of Shipbuilding Technology." CRIST became the legal successor of RPA Ritm
March 1994	CRIST incorporated two companies: • Design company Soyuzproektverf (former State Union Design Institute Soyuzproektverf); • Design bureau for shipborne valves and fittings Armas (former Central Design Bureau of Znamya Oktyabrya plant)
June 1994	CRIST was awarded the status of the State Scientific Center of the Russian Federation (decree of the Government of the Russian Federation No. 649 dated June 5, 1994)
March 1998	CRIST incorporated Vostok, Design bureau for fishing and research vessels
March 21, 2007	By the decree of the President of the Russian Federation No. 396, the State Enterprise CRIST is reorganized into Open Joint Stock Corporation "Shipbuilding & Shiprepair Technology Center" (OJSC SSTC)
November 17, 2010	OJSC SSTC was awarded the Certificate of Honour from the Russian Government for substantial input in development of shipbuilding industry and implementation of advanced technologies
March 19, 2015	Due to entry into force of the Federal Law No. 99-FZ, OJSC SSTC was reorganized into Joint Stock Corporation "Shipbuilding & Shiprepair Technology Center" (JSC SSTC)
October 14, 2016	JSC SSTC acquired major shareholding of PJSC "Burevestnik Plant"
April 16, 2021	JSC SSTC acquired major shareholding of JSC NNRICM "Prometey"

RESEARCH-AND-DEVELOPMENT ACTIVITIES

High level of R&D works carried out by JSC SSTC is confirmed by the awarded status of the State Scientific Center of the Russian Federation

JSC “Shipbuilding & Shiprepair Technology Center” takes an active part in fundamental research activities in developing advanced technologies for shipbuilding, ship repair and engineering sectors, including those based on the use of highly concentrated power sources

Research fields:

- Fundamental and applied studies of shipbuilding and ship repair technologies, development of advanced technologies
- Research and development works for design, construction, repair, modernization, maintenance, retooling, operation and disposal of all types of ships, vessels (including nuclear-powered ones) and marine equipment
- Development of new production processes; design, fabrication and implementation of equipment for mechanization, automation and robotization of facilities at shipyards and dockyards, mechanical engineering enterprises and multipurpose industrial equipment
- Development of technologies and process equipment for treatment of spent nuclear fuel and radioactive wastes upon disposal of ships and vessels
- Studying physical and chemical properties of modified polymeric, composite and nanomaterials as well as technologies for their acquisition, processing and application
- Surveys in field of digital transformation of shipbuilding industry, computer-aided modelling of articles, facilities, production and process procedures at shipyards, including application of simulation modelling, 3D-modeling, AR/VR, predictive analysis
- Theoretical basis of elastic-plastic strain of metals, methods for usage of high-density energies, surveys of super-plasticity effects when reprocessing or creating materials for shipbuilding industry, optimization of processing modes and parameters
- Formation and accumulation of welding deformations and stresses in large-dimensioned ship structures, their impact on structural integrity and methods to reduce the same with use of modern resource-saving technologies
- Methods to ensure alignment and assemblability of complex mechanical systems on elastic foundations, mathematical modelling, optimization of parameters for installation of on-board systems, mechanisms, devices, equipment and machinery
- Theoretical basics of marine triboengineering, modelling of operation for antifriction materials when lubricated by sea water and fresh water
- Theory of operating agent outflow through leakage points of design-processing origin in joints of pressure-tight circuit elements and selection of optimal methods for testing of ship structures and products

JSC SSTC is engaged in scientific-technical activities under a series of Governmental and National Programs:

- Governmental Program of the Russian Federation “Development of Shipbuilding and Techniques for Exploration of Offshore Deposits”
- Governmental Program of the Russian Federation “Development of the Military-Industrial Complex”
- Governmental Program of the Russian Federation “Scientific and Technical Development of the Russian Federation”
- National Program “Digital Economy of the Russian Federation”
- Governmental Program “Development of Nuclear Power Generation Complex”

JSC SSTC issues a scientific-technical journal “Sudostroenie” (“Shipbuilding”), 6 issues per year.

DESIGN OF FACILITIES

JSC SSTC is the oldest company in the Russian Federation that renders complex design of shipbuilding and shiprepair enterprises, hydraulic engineering facilities, ship machine-building and instrument-making plants, office and laboratory buildings and non-standard equipment.

Dozens of major plants have been constructed under complex projects of JSC SSTC: JSC PA “Sevmash” and JSC SC “Zvezdochka” in Severodvinsk, JSC FES “Zvezda” in Bolshoy Kamen, “Amur Shipyard” in Komsomolsk-on-Amur, “Zelenodolsky shipyard in the name of A.M. Gorky” in the Republic of Tatarstan, Yantar Shipyard in Kaliningrad, shipyards in Kherson and Vyborg, unique dry-docks in Kertch and Nikolaev, “Lotos” shipyard on Volga river in the Astrakhan region and many others.

As per projects of JSC SSTC shipyards and dockyards were built and upgraded in Egypt (Alexandria shipyard), India (Visakhapatnam, Mumbai, Jamnagar, Cochin, Goa), Bulgaria (shipyard in Burgas), Vietnam (X-51, X-52, Bag Dong, Bashon), Iran (dockyard in Bender-Abbas), Algeria (shipbuilding and ship repair yard in Mers-El-Kebir), Romania (two dry docks), Hungary (ship cranes construction yard). Technical assistance was rendered for GDR, PNR, SFRY, Marocco, etc.

Projects for naval onshore infrastructure were developed for Vietnam, Algeria, Angola, Cuba, Ethiopia and other countries.

Success in implementation of SSTC’s past and ongoing projects is based above all on deep-level study of future yards even at the stage of finalization of Technical Assignment with the customer and at the earliest design stages. Capabilities of each yard and each production facility are estimated based on actual demand of the customer (shipbuilding and ship repair program) for mid-term and long-term perspective.

Projects of JSC SSTC are now implemented by state and private companies in tropical, permafrost and high-seismic areas, on rocky and marsh soils.

JSC SSTC is currently:

- Completing reconstruction and retooling of almost all types of facilities at JSC PA “Sevmash” to ensure construction of advanced nuclear powered submarines
- Developing projects for reconstruction of hydraulic facilities for SC “Nerpa”, “Amur Shipyard” and Tobolsk Shipbuilding and Ship Repair Yard, as well wet launching dock for JSC SC “Zvezdochka”
- Developing working design documentation for reconstruction and retooling of welding and assembly facilties at JSC “Baltic Shipyard”
- Rendering field supervision in frames of investment project “Modernization and Development of Russian Facilities for Construction of Modern River Fleet for Inland Waterways” for JSC “Zhatay Shipyard”
- Supporting construction, reconstruction and retooling of JSC “Onega Shipbuilding and Ship Repair Yard” (in frames of “Digital shipyard” project)
- Rendering complex design of facilities for JSC SPA “Arktika”, JSC “Tank Repair Yard No. 61”, FSUE “Atomflot”
- Developing concepts for construction of new shipyards oriented on heavy-tonnage construction in North-West region, dockyards for fishing companies in Murmansk region and Kamchatka region and compact shipyard for civil shipbuilding in Sevastopol.

SHIPYARDS DESIGN

Activities

- Development of design and estimate documentation (DED) as per urban planning codex of the Russian Federation and other normative documents, finalization of DED in State Ecology Committee and FA “Glavgosexpertiza of the Russian Federation”
- Development of working documentation based on approved DED
- Development of concept design for prospective development of yard production facilities
- Development of documents for substantiation of scheduled investment in relevant state agencies
- Development of technical projects for construction and transfer equipment
- Development of working design documents for non-standard equipment
- Development and finalization of special technical conditions in the Ministry of Construction of the Russian Federation

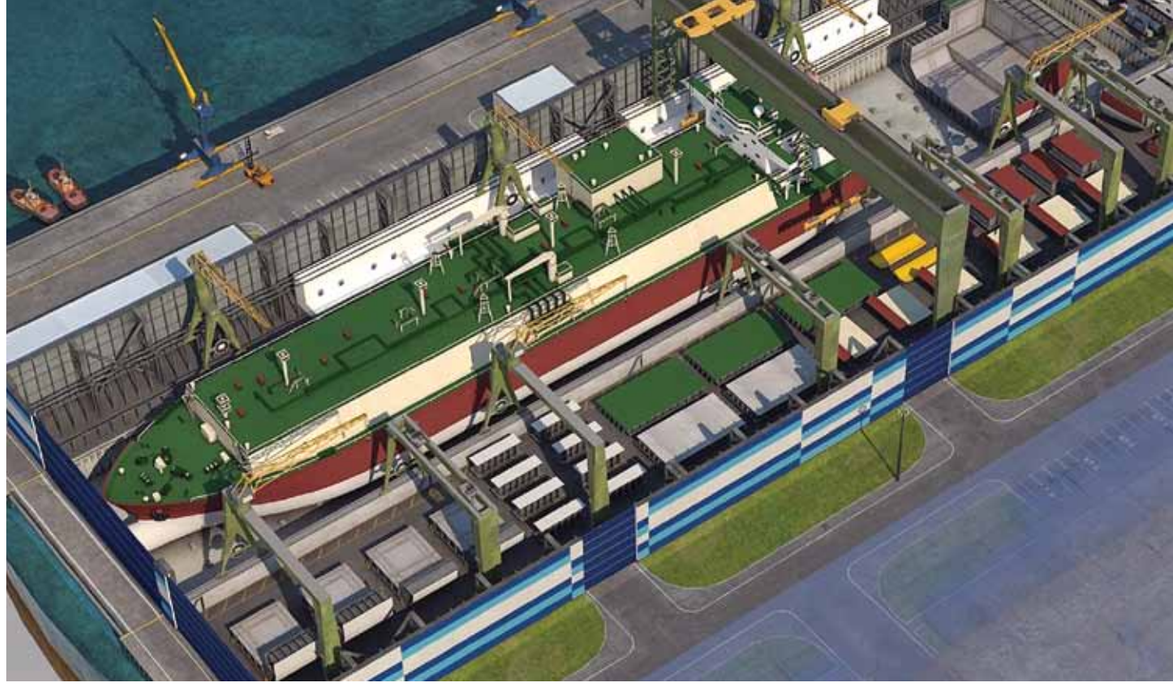
Design objects

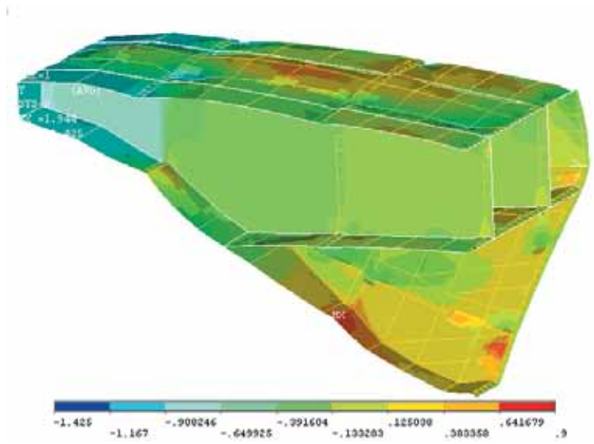
- All-purpose shipyards and dockyards
- Hydraulic facilities (dry docks, slipways, building berths, quays, mooring facilities and fencing structures)
- Production companies for shipboard machinery and marine instruments
- Production companies for offshore marine equipment
- Power facilities (transformer substations, LPA/HPA compressor stations, gasification stations, boiler houses, etc.)
- Ships and vessels disposal facilities
- Onshore facilities for ship stationing

MODERN CONSTRUCTION TECHHOLOGIES FOR SHIPS AND VESSELS

- Development of technologies for construction of ships, vessels and off-shore facilities of all types and purposes
- Organisational and technical design projects for augmentation and reconstruction of existing shipbuilding and ship repair yards and for construction of new ones
- All-round automation and robotization of hull-making and assembly-welding facilities, including implementation of the following processes:
  - precise laser cutting and plasma cutting of plates;
  - bending of double-curved items by sequential-local and rotation-local deformation;
  - robotized cutting of profiles;
  - robotized welding and assembly of micropanels;
  - automated assembly and welding of flat sections on production line;
  - assembly and welding of curved sections of ship extreme ends by framing method;
  - automated assembly and welding of T-beams
- Comprehensive automation of pipe production
- Implementation of computerised measuring systems based on electronic tacheometers, laser trackers and scanners for the following processes:
  - manufacturing of sections and blocks for ship hulls;
  - manufacturing of pipeline components;
  - installation of equipment, systems and navigation devices;
  - manufacturing of protective means for nuclear power plants
- Implementation of advanced outfitting technologies
- Development of technologies for block and block-module construction of large vessels and off-shore facilities from densely outfitted assembly units
- Development of processes and procedures for assembly and welding of ship hull structures based on computer simulation, including complex volumetric structures with curvilinear configurations and contours
- Development of low-frequency vibration treatment procedures for removing residual stresses and stabilizing the shapes and dimensions of welded structures based on computer simulation

  Development of technologies for impermeability and tightness testing of ship structures and environmentally hazardous objects
- Development of technologies for construction of ships and manufacturing of composite-material items
- Development of technologies for application of acoustic and protective coatings
- Development of digital end-to-end technologies for shipbuilding and ship repair
- Studying air noise sources and creation of integrated protection systems against air noise and vibration onboard ships, vessels and rigs
- Development of technologies for installation and dismantling of power plants, machinery and systems
- Alignment of shipborne systems. Development of technologies for weapons installation
- Development of technologies for independent manufacture and installation of pipelines based on 3D model
- Implementation of technology for installation of ship mechanisms and devices with EPM polymer material
- Development of standard normative documents for managing labour intensity in construction of ships and marine facilities



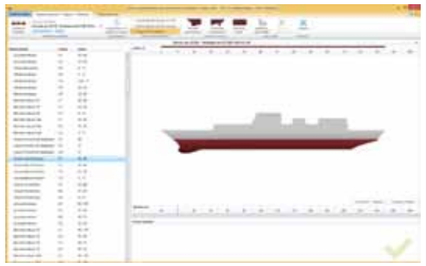


MODERN TECHNOLOGIES FOR REPAIRING SHIPS AND VESSELS

- Development of technologies for repair of ships and vessels of all types, classes and purposes
- Participation in reliability (repairability) examination of ships and vessels at all stages of their design and construction
- Development of procedures for estimation of technical condition and service life extension of ships and vessels
- Development of design (technological and repair), standard and typical logistic documents for in-dock and at-yard repairs of ships, vessels and floating facilities, their parts and components
- Design and technological support for repairs of ships and vessels, their components and parts
- Development of technical documentation for disposal of domestic and foreign ships and vessels after decommissioning
- Expert evaluation of technical condition of ship repair bases and facilities in respect of their equipment. Technical proposals on their reconstruction in accordance with their specialization in ship repair
- Development of design and technical documents for preservation and depreservation of ships and vessels
- Development of methods for non-dismantling diagnostics of ships, vessels and their equipment
- Development of technical requirements for supporting the serviceability and repair of ships and vessels at their bases and stationing places
- Development and assessment of repair and technical documents for exportable ships, their parts and components

INFORMATION TECHNOLOGIES IN SHIPBUILDING

- Development of methodological and technical documents for setting-up corporate information systems for construction, operation and repair of ships, vessels and marine equipment
- Implementation of corporate information systems at shipbuilding and ship repair yards
- Functional and informational modelling of business processes. Development of CAD/CAM/PDM software for modelling complex technological items and for issuing functional technological documentation based on the models for separate types of production and manufacture
- Development of electronic technical documentation (electronic catalogues, interactive technical manuals for operation and repair of articles and objects). Development of computerised training software
- Simulation and complex modelling of complicated technical systems, production and technological processes for marine equipment construction
- Development and supply of CAD/CAM/CAPP systems to shipyards and dockyards for shipbuilding and ship repair purposes
- Design and verification of processes for manufacturing complex items and for installation works using 3D electronic models and special packages for analysing the ergonomics
- 3D modelling and animation of productions, facilities and complex technical items for their reconstruction or designing anew
- Computer modelling and engineering analysis at all stages of designing and developing technological equipment including calculations for strength and rigidity, analysis of kinematic diagrams
- Analysis and study of complex products, objects and technical systems based on their 3D electronic models with application of virtual reality technologies. Virtual trainings and simulators



DESIGNING AND MANUFACTURING OF TECHNOLOGICAL EQUIPMENT

JSC SSTC designs and fabricates technological equipment for shipyards and dockyards as well as for other industry branches

- Various models of Ritm-type machines for thermal cutting of metal, intended for laser, plasma, gas, combined, and gas multi-torch cutting. Width of processed plates from 2 to 4.5 m.
- Machines with 250N and 1000N force for cold bending of complex-shaped plates by means of rotary-local deformation
- Various types of CNC/manual-controlled pipe-bending machines for cold bending of pipes of 219 mm max. diameter, machines with induction heating for bending of pipes of 377 mm max. diameter
- Special-purpose machines for plasma welding of plates made of aluminium alloys with thickness up to 20 mm and for single-pass vertical groove welding and weld reinforcement deposits
- Process equipment for production lines

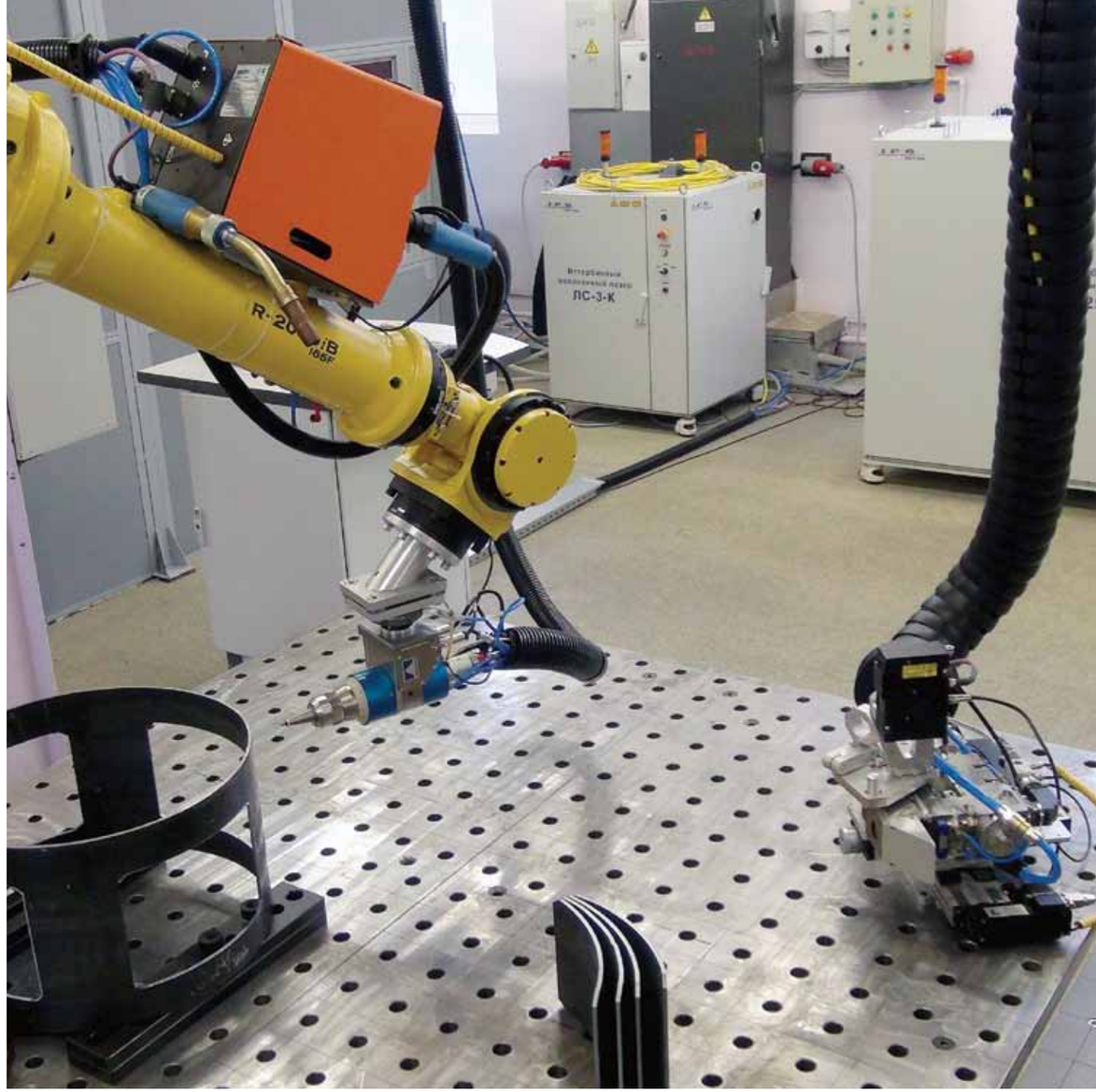
- Mobile shot-blasting devices for dust-free cleaning of metal surfaces by closed and open abrasive jets of “Buran” type
- Stands for testing and flushing water systems and hydraulic systems and for testing and adjusting hydraulic equipment
- Automated stand for assembly of pipes and pipelines SGT-160M
- Stand for durability and leakage tests of heat exchangers
- Portable metal processing machines for critical structures
- Device for installing the lower part of the steerable rudder propeller, lifting capacity 200 t
- Design of various non-standard equipment as per Customer’s demands, reverse engineering

IMPLEMENTATION OF LASER TECHNOLOGIES INTO SHIPBUILDING INDUSTRY

Since 2011, JSC SSTC acts as the coordinating body for the working group «Laser Production Technologies» of the technological platform «Innovation Laser, Optical and Optoelectronic Technologies» (Technological Platform «Photonics»)

Based on rendered surveys, the following equipment has been designed:

- Complex of equipment for mechanized assembly, laser scanning with photogrammetry and for robotized welding of micropanels
- Complex of equipment for laser cutting, hybrid laser-arc welding of plates butts and welding-on of stiffeners to panels of flat sections
- Robotized complex for precision laser cutting and welding of voluminous complex-shape structures made from steel and different grades of aluminum alloys during manufacture of shipborne mechanical engineering items and ship hull sections
- Robotized complex for laser welding of thin-walled items to bulk solid structures, including welding in hard-to-reach areas during manufacture of shipborne mechanical engineering items
- Robotized complex for laser gas-powder cladding for manufacture and repair of shipborne mechanical engineering and general machinery items



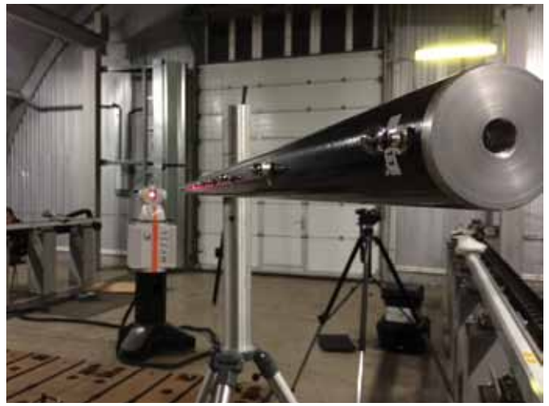
SPECIALIZED INDUSTRIAL CENTER FOR HIGH-PRECISION MEASUREMENTS

In 2009, a specialized industrial center for high-precision measurements was established within JSC SSTC. Its main activity is methodical support of industrial enterprises for implementing modern 3D measuring means and technological processes of dimensional audit and control by using these means. Application of these means enables to raise the level of automation in dimensional audit and control, to improve precision in manufacture of products, and also to reduce the time and improve the quality of ships and vessels construction

Main goals of the center:

- Development and implementation of technological procedures for dimensional checks based on application of 3D measuring means in shipbuilding and other industries
- Tests and trials of measuring equipment
- Development of methods for measurements, their approbation and certification
- Performing high-precision measurements in various industries
- Training of customer's specialists in using modern measurement methods
- Summarizing of foreign experience in carrying out measurements and development of recommendations for implementing such experience
- Setup of inter-industry relations in the field of high-precision measurements

Specialists of the center carry out a large scope of works within the framework of government defence order, including those for providing installation accuracy and alignment precision for specialized complexes on-board battle ships and modern multiple-launch rocket systems.



TECHNOLOGIES AND EQUIPMENT FOR NUCLEAR POWER INDUSTRY

Development of technologies and special equipment for floating and stationary nuclear objects:

- Technologies for setting-up immobilization shields and additional biological protection at floating and stationary nuclear-hazardous and radiation-hazardous industrial and naval objects
- Development of technologies for disposal of nuclear powered and nuclear support vessels:
  - development of requirements and norms for disposal of nuclear support vessels;
  - development of concepts and projects for disposal of nuclear support vessels;
  - development of principal and standard technologies for conversion and recycling of nuclear support vessels, preservation of nuclear and radiation hazardous objects;
  - development of requirements and norms for storage of decommissioned nuclear support vessels
- Development of technologies and special materials for concreting and long-term preservation of decommissioned nuclear and radiation hazardous objects
- Development of technologies and special equipment for handling of spent nuclear fuel and protection-and-control rods, including defective spent nuclear fuel
- Development, certification and serial production of special reinforced-concrete containers for long-term storage and burial of solid nuclear waste and for solidified liquid nuclear waste with medium and low level of radiation activity
- Scientific-methodological support for extending service life of nuclear power objects at production facilities of the Ministry of Industry and Trade

Design of disposal facilities

Development of design and construction documents for setting-up facilities for disposal of nuclear submarines, nuclear powered and nuclear support vessels, including handling of spent nuclear fuel and radioactive waste in any physical state

TECHNOLOGIES OF COMPOSITE-MATERIAL SHIPBUILDING

JSC SSTC has been working in field of composite-based shipbuilding for more than 50 years. Constant progress and implementation of modern technologies in the field of composite materials enable us to carry out works in the following areas:

- Development of technologies and production of structures made of polymer composite materials by the method of automated prepregs placement
- Development of technological processes for construction and repair of ships and vessels with hulls made of composite materials
- Development of technologies for production of structures by wet winding method
- Technical support and supervision for construction of ships and vessels with hulls made of composite materials
- Fitting workshops (bays) with modern equipment for mechanized production of structures by the methods of infusion, RTM, winding, and hot compaction
- Physical-mechanical tests of composite materials within the frames of certification area granted to the test centre ITs TsNK-Sudoplast (RMRS Certificate of testing laboratory recognition No. 22.06871.120 dated 10.01.2022)

Special coatings application procedures

JSC SSTC is the leading developer of application procedures for special coatings of various types and is responsible for their performance.

Application procedures development includes:

- surface preparation;
- selection and trials of adhesives and modifying compounds/sealants;
- drawing up the list of required equipment;
- quality control

JSC SSTC renders application supervision and lifetime extension of special coatings

FABRICATION OF SHIBBOARD MACHINERY AND MATERIALS

- Antifriction materials “ANITA-40” and “ANITA-40H” conform to TC1915-014-07502259-2000 and intended for use in friction assemblies as lubricating component for heavy-duty bearings of propeller shafts jointly with FUT agent and in self-lubricating bearings of outboard drives as part of friction couple with bronze (“ANITA-40”) or titanium (“ANITA-40H”)
- Antifriction composite materials of “SFERA T” and “SFERA TD” type are based on Polyether ether ketones (PEEK) and are alternate to “Grafelon 20M” material used as sealant in joint assemblies of shipborne globe stop valves. Antifriction composite materials of “SFERA T” and “SFERA TD” type are based on fluorine plastic and are alternate to “ANITA-40” and FUT materials used to fabricate inserts of sliding bearings. “SFERA” products have certificate of approval issued by IDC (decision of IDC No.4-06-2022 dated 26.05.2022) and standard certificate of approval No. 22.44.01.04079.120 dated 10.08.2022 issued by RMRS
- Sliding bearings of propeller shafts and antifriction materials “SFERA-40TD” is intended for use in shaft lines with 600 mm max. diameter of ships and vessels. The insert is made of pressed compound “SFERA 40 TD” as per TC 1915-091-07502259-2012
- Sliding bearings SAMM-3 and SAMM-4 are based on self-lubricating antifriction materials “ANITA-40” and “ANITA-40H” and are intended for use in heavy-duty frictional assemblies with rotary, swinging and reciprocating motion, operating in sea water or both in sea water and in the open air
- Material “EPM” is intended for fabrication of supports and cylinder-shaped compensators in shipbuilding, mechanical engineering and other industries upon equipment installation. This material is petrol-resistant and can be used in sea water and fresh water. Operational conditions of “EPM” material conform to category OM-1 as per GOST 15150. List of accompanying documents for “EPM” material is given below:
  - standard certificate of approval № 23.44.01.03559.120 dated 05.04.2023 issued by RMRS
  - Conclusion of the Scientific-Research Institute (Naval shipbuilding and weapons) of the Naval Military Educational-Scientific Center of the “Naval Academy”
  - decision of inter-department committee (acting as per of NRC “Kurchatov Institute” – CRISM “Prometey”)

OFF-SHORE TECHNOLOGIES

New technologies, equipment and production facilities for off-shore rigs construction

- Development of technologies for construction of off-shore rigs for sea shelf exploration
- Participation in development of construction technology for marine ice-resistant stationary oil platform Prirazlomnaya and semi-submerged drilling rig of Moss type
- Development of technology for construction of gas-carriers, manufacture and installation of various types of systems for cargo storage (LNG)
- Determination of activities for construction of gas-carriers at Russian shipyards, evaluation of necessary capital expenditures
- Design and production of automated and robotized equipment for off-shore facilities construction, manufacturing of equipment for construction and installation of membrane tanks of NO 96 type components
- R&D works for development of Russian construction of tanks purposed for transportation of liquefied gases, including those made of composite materials
- Development of design projects for technical augmentation of existing yards and production facilities and construction of the new ones for construction of drilling rigs and gas-carriers
- On the basis of design documentation developed by JSC SSTC, the “Astrakhanskiy Korabel” plant has been modernized for producing block-modules of upper sections of drilling rigs, and the quay at the “Zvezdochka” shipbuilding center has been rebuilt for manufacturing sea shelf exploration means
- Development of labor intensiveness standards for construction of marine equipment for shelf exploration, gas-carriers and FPSO

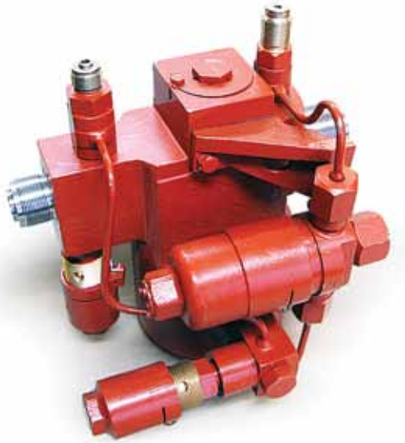
ON-SHORE FACILITIES FOR SHIPS AND VESSELS STATIONING AT BASE

Setting-up onshore facilities and infrastructure for operation and maintenance of ships at all stages of their service life, including facilities for operation and maintenance of naval weapons

- Development of design projects for creating (augmenting) on-shore facilities for stationing at base and providing infrastructure for ship-repair works, including repair of weapons systems
- Development of design projects for facilities engaged in operation and repair of naval weapons
- Supply of equipment, accessories, tools and materials, spare parts and accessories, operation and repair documentation
- Deputation of specialists for rendering technical assistance in installation, adjustment and commissioning of equipment
- Training of customer's specialists in setting-up on-shore infrastructure, maintenance and repair (modernization) of ships, and operation and maintenance of Russia-made equipment
- Field supervision, fulfilment of warranty obligations for completed supplies, post-warranty maintenance of equipment during its service life

SHIPBORNE VALVES AND FITTINGS

- Designing of pipeline valves and fittings, filters, components for pipeline connections and joints with other equipment and machinery, their manufacture, tests, and supply for enterprises and companies of shipbuilding, nuclear power, oil-processing and other branches of industry.
- Research and development works for creation of valves, fittings and filters. Design and fabrication of fitting assemblies which are essentially fragments of ship systems to increase reliability and reduce labour intensiveness of installation works during construction, repair and operation of ships and vessels
- Modern multifunctional processing equipment and CNC-machines allow to process fittings of any configuration and complexity. In frames of new articles preproduction, the following measures are undertaken: ensuring structural processability, development of process procedures, jigs and fixtures, estimation of technically justified material and labour norms, equipment and production facilities, implementation and control of process procedures in frames of production process. Execution of the above works allows to fabricate all types of valves and fittings of required quantity and quality at the earliest
- Participation in field supervision in OEM premises for timely delivery of valves and fittings to ships and vessels being under construction
- Another important production activity is bench testing of valves and fittings. Each article undergoes trials to check its compliance with OEM specifications: leak tightness, operability, vibro-acoustic, hydraulic and aerodynamic specs, resistance to external factors
- Application of modern design and process solutions, advanced technologies and high-performance equipment, usage of corrosion-resistant and erosion-resistant construction materials for sealing assemblies, application of strengthening techniques ensure high operational reliability, extension of service life up to 100-120 thousand hours and minimum rate of acoustic vibrations



VESSEL DESIGN

Development of technical design projects, as well as detailed design documentation and repair documentation for construction, repair, modernization, renovation and reclassification of all types of sea- and rivergoing vessels

- Design of fishing and fish-processing vessels of various purposes
- Design of shipborne fish-processing complexes
- Evaluation of commercial efficiency of fishing vessels
- Design of cargo-refrigerator vessels and bulk carriers
- Design of special research vessels and off-shore facilities for exploring continental shelf and ocean resources
- Design of auxiliary and service vessels, such as tugs, collectors of bilge and waste waters, collectors of oil and sludge, fuelers, and other special vessels for commercial and fishing ports
- Designs of modern special vessels for protection of water bio-resources
- Development of investment projects for construction of new vessels in Russia, including those that use special types of crediting and leasing

FOREIGN ECONOMIC ACTIVITIES

JSC SSTC has active research and business cooperation with foreign customers and scientific centers from more than 40 countries in the following main areas:

- Military-technical cooperation in shipbuilding and ship repair (design and modernization of shipbuilding and ship repair enterprises), setup of on-shore infrastructure at naval bases for supporting operation of supplied equipment, including armament and weapons systems, their exploitation, maintenance and repair
- Overseas sales of civil products and services
- Scientific-technical relations with international and foreign organizations and institutions

Over the past 15 years, JSC SSTC has concluded and fulfilled around 100 contracts with foreign customers, the total cost being over USD 1 billion. Under these contracts, our company has supplied technological and design documents, several thousand units of serial and unique equipment which are presently in use at shipbuilding and ship repair yards, as well as at naval bases worldwide. In the recent years, the volume of export works reached the level of 35-40% of the total scope of works of JSC SSTC.

JSC SSTC offers foreign customers a complex solution for tasks they face, beginning from the development of technological, design and engineering documents, delivery of equipment, materials, tools and spares, and finishing with training of personnel, warranty and post-warranty service of the supplied equipment.

JSC SSTC carries out its foreign economic activities in close cooperation with JSC Rosoboronexport and industrial companies.

In 2004, JSC SSTC established research-education center (REC) in its premises for integration and coordination of research, scientific and innovative potential of all subdivisions of JSC SSTC and collaborating enterprises in frames of joint educational activities. The center is mainly focused on training, recurrent training and advanced training of personnel of Navy, shipyards and dockyards of foreign countries under decisions adopted by the Government of the Russian Federation, contracts and agreements with the foreign customers.

From the date of establishment, REC has trained more than 1 500 specialists from Russia and foreign countries.

REC of JSC SSTC renders educational activities in accordance with license issued by the Federal Supervision Agency in the field of Education and Science of the Russian Federation.

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