



РОСАТОМ

Presentation of information at the round table "Environmental safety of the nuclear industry: strategy, regulation, technologies" within the framework of ATOMEXPO 2017



ТОПЛИВНАЯ КОМПАНИЯ РОСАТОМА

ТВЭЛ

ГОСУДАРСТВЕННАЯ КОРПОРАЦИЯ ПО АТОМНОЙ ЭНЕРГИИ «РОСАТОМ»

Ecological safety strategic development directions of the Rosatom State Corporation's Fuel Division

Speaker:

Batov Semen Timofeevich

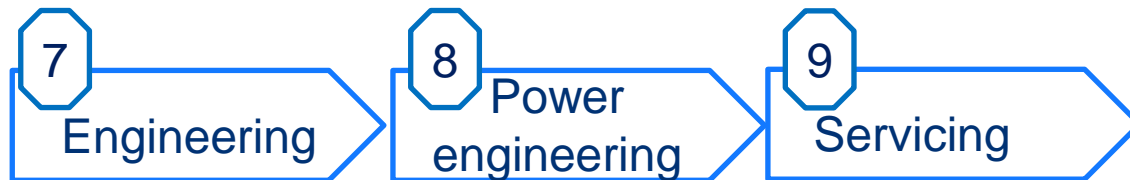
**Head of the JSC TVEL Department of labor protection,
industrial safety and ecology**

Date: 20.06.2017

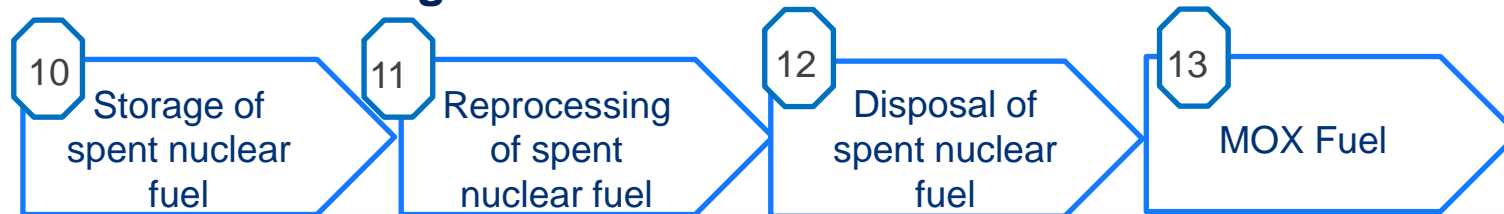
Initial stage of the nuclear fuel cycle (NFC)



The operation of NPP life cycle



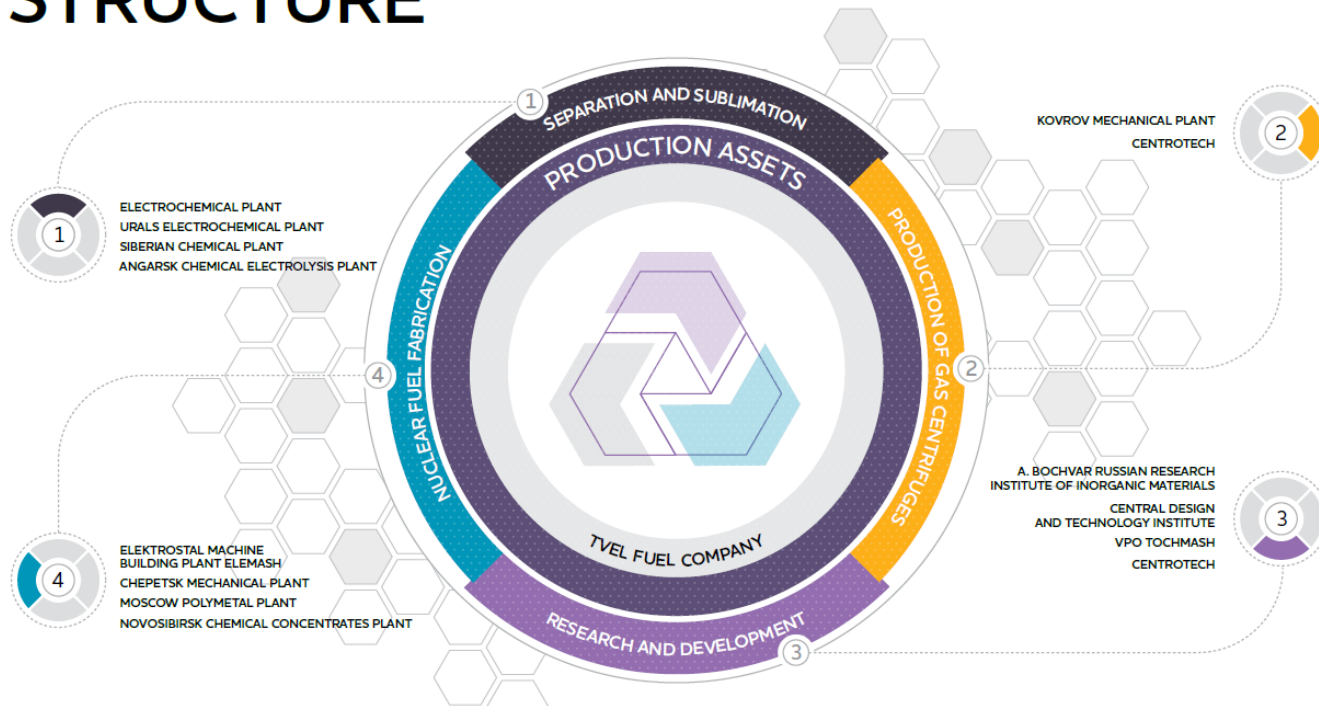
The terminal stage of the NFC



Geography of environmental responsibility of TVEL Fuel company



TVEL STRUCTURE



The main program documents providing for the implementation of measures in the field of environmental protection and ensuring environmental safety

Foundations of state policy in the field of environmental development of the Russian Federation for the period up to 2030

Foundations of Environmental policy of the Rosatom State Nuclear Energy Corporation and its organizations

The policy of JSC TVEL in the field of ecology

The Policy of the Subsidiary of the Fuel Company in the Field of Ecology



Comprehensive plan for the implementation of the Environmental Policy of the Rosatom State Nuclear Energy Corporation for 2016 and until 2018

Plan for the implementation of the Environmental Policy of JSC "TVEL" and environmentally significant organizations that are part of the management of the Fuel Company

Plan for the implementation of the Environmental Policy of the environmentally significant organization of the Fuel Company

Certificate of conformity

Of the management system with the ISO
9001:2008, ISO 14001:2004, BS OHSAS
18001:2007 and ISO 50001:2011 standard



IMS: goal-setting and boundaries of influence

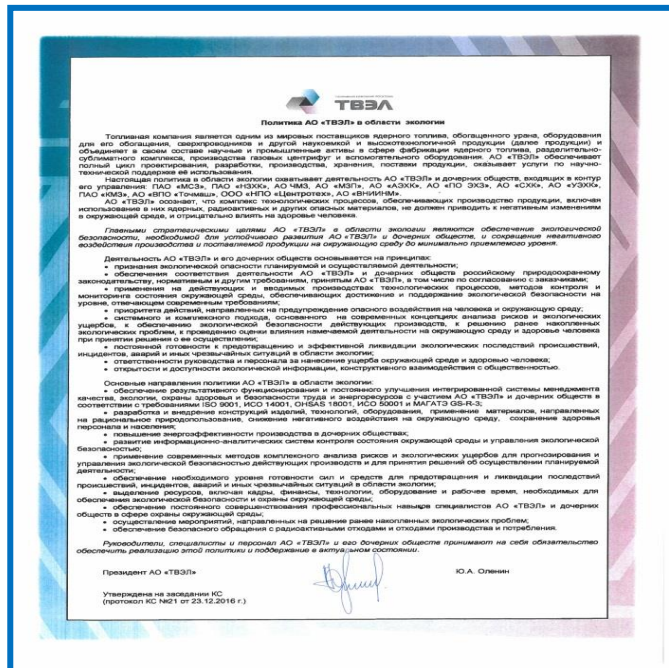
The introduction of IMS allows to:

- organize an efficient and effective corporate management system;
- strengthen the competitiveness of TVEL fuel company in the world market;
- increase customer satisfaction;
- increase the efficiency of the use of resources;
- improve the image of the Fuel Company;
- improve the indicators that characterize the impact on the environment and the health of personnel.

Environmental policy

Environmental management is implemented via:

- ❖ Formation and implementation of environmental aspects in each management decision;
- ❖ Harmonious coexistence of each TVEL fuel company employee with nature;
- ❖ Introduction of resource-, energy-saving and non-waste production technologies;
- ❖ Integration of environmental risk management issues into all production and business processes in order to minimize and / or eliminate environmental problems.;



Fuel Company TVEL is now in the process of transferring the Corporate Environmental Management System to comply with the international standard ISO 14001:2015

ISO 14001:2015

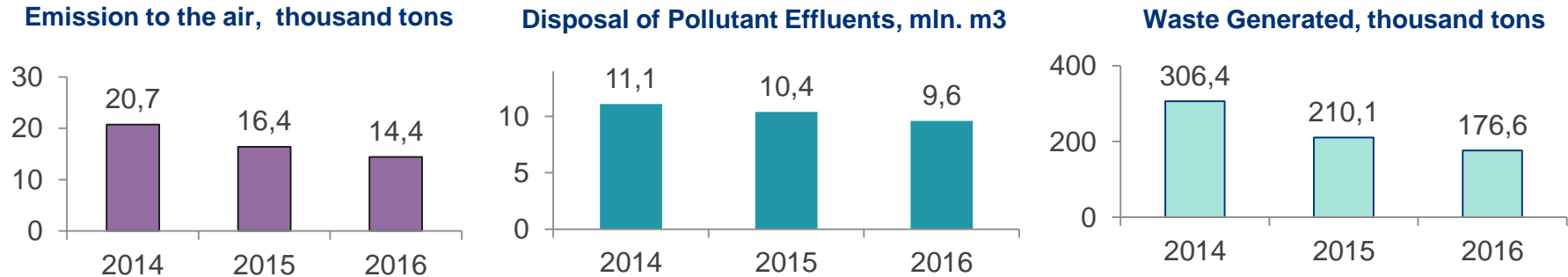
Directions for the implementation of the TVEL Fuel Company Environmental Policy



Level of production and technical actions:

- **Elimination of the consequences** of damage inflicted to the environment during the implementation of the Soviet Union state defense programs during the establishment of the nuclear industry;
- **reducing the impact** of current production activities of the enterprises on the environment;

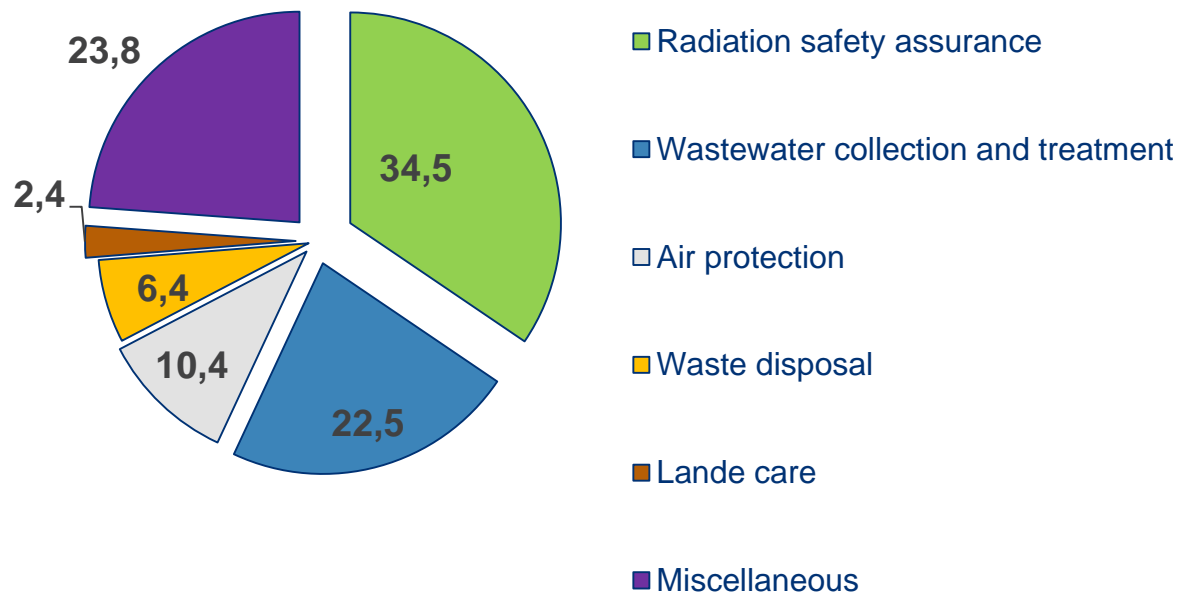
Reducing the environmental impact of TVEL fuel company



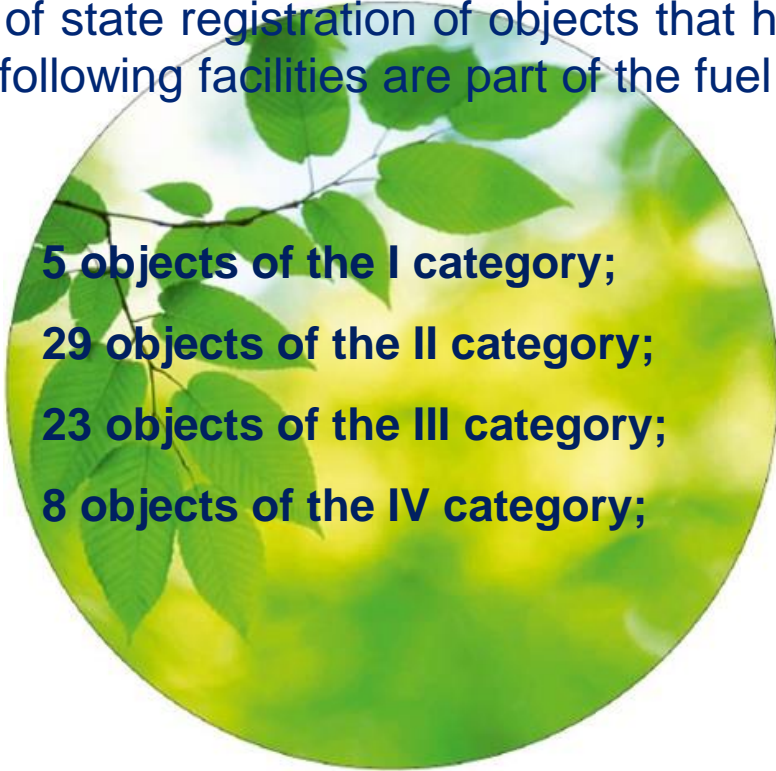
Amounted to
**2 billion 106 million
rubles** in 2016



Environment Protection Costs Outlay , %



Following the results of state registration of objects that have a negative impact on the environment, the following facilities are part of the fuel company:



5 objects of the I category;
29 objects of the II category;
23 objects of the III category;
8 objects of the IV category;

Subsidiary	Event
Protection of atmospheric air	
JSC "PA ECP"	Modernization of refrigerating machines
JSC CMP	Installation of devices in ducts before and after gas purifiers SMOG-1 and SMOG-2 of the PVC system in the building 745B of shop № 85 at JSC CMP
PJSC MSZ	Reconstruction of technological ventilation based on local gas cleaning systems in the second department of shops 48 at PJSC MSZ
JSC BOCHVAR «VNIINM»	Reconstruction of JSC BOCHVAR VNIINM boiler house with installation of two automatic hot water boilers
PJSC "NCCP"	Modernization of the gas cleaning section in the production of lithium metal

Subsidiary	Event
Protection of water bodies	
JSC "AECC"	Replacement of metering devices for domestic wastewater discharged from the industrial site
JSC "PA ECP"	Reducing the consumption of industrial water due to the inclusion of two cooling systems in the building 901 air conditioning system
PJSC "NCCP"	Installing a system of sewage treatment facilities from the industrial site
PJSC "MSZ"	Reconstruction of water supply systems and systems for collection, purification and preparation of industrial water for use in technical water supply
PJSC "Kovrov Mechanical Plant"	Putting into operation of the sewage sanitation unit of the galvanic section
PJSC "Kovrov Mechanical Plant"	Provision of the territory of water intake facilities with drainage sewage system
PJSC "Kovrov Mechanical Plant"	Reconstruction of water intake facilities

Общество ТК	Event
Ensuring radiation safety and eliminating "accumulated" harm	
JSC "AECC"	Removal from service of buildings no. 802, 804
JSC VNIINM	Withdrawal from operation of installation U-5
PJSC "NCCP"	Decommissioning of fuel rod production for PUGR (uranium-graphite production reactor)
PJSC "NCCP"	Establishment of a complex treatment site for liquid and solid radioactive waste
PJSC "NCCP"	Acquisition and commissioning of a modular soil demercurization unit
JSC CMP	Preservation of spent tailings storage facility №1
JSC "SCC"	Isolation of pools B-1 and B-25
JSC "SCC"	Preservation of terrestrial SRW storage sites, area 16
JSC "SCC"	The construction of additional safety barriers to prevent the release of radionuclides from radioactive waste storage facilities
JSC "SCC"	Modernization of the operable automated radiation monitoring system ASKRO
JSC "UEP"	Technical re-equipment of the non-ferrous metal remelting site in building 302 of the machinery revision workshop
PJSC "MSZ"	Creation of a section for processing liquid radioactive media

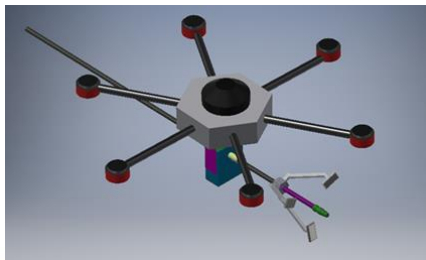
JSC TVEL strategic initiative "Environmental responsibility"



In 2017, an information and environmental project "Clean City - Safe World" was initiated. In its framework the students of physical and mathematical lyceums, based in school technoparks, supervised by the Fuel Company, in the territories of the JSC "PA ECP", JSC "SCC", JSC "UEP" and JSC "UEP", JSC CMP, have developed robots to help the humanity improve the level of environmental protection and monitor its condition.

The following developments arise the greatest business interest, as estimated by the experts from MEFPI and Bauman Moscow State Technical University:

The eco-elevator robot is a flying hexakopter model with outboard equipment for environmental monitoring of exhaust pipes of power facilities (nuclear power plants, thermal power stations) **Development of the Physics and Mathematics Lyceum of the Closed Administrative-Territorial Entity Seversk**



The radiation monitor robot monitoring the storage of containers with uranium hexafluoride in the open air

Development of Lyceum № 58 of Novouralsk Closed Administrative-Territorial Entity



Implementation of the program "Introduction of non-waste technologies" aimed at:

- development and implementation of technologies for the elimination/reduction of radioactive waste;**
- introduction of modern methods of processing and utilization of radioactive waste;**
- introduction of advanced methods for preparing facilities for decommissioning;**

The planned introduction of the best available technologies at enterprises included in the Fuel Company management loop aimed at reducing the negative impact on the environment.

Implementation of the comprehensive Action Plan of the State Corporation Rosatom to reduce the negative impact of the industry organizations on the environment in priority areas.

Annual holding of a competitive tender in the nomination "The best solution for ensuring environmental safety" within the framework of the corporate competition on "Best solution / development".

Annexes

Fuel Company proposals in the Action Plan of the Rosatom State Atomic Energy Corporation to reduce the negative impact of the industry's organizations on the environment for the activities financed from the IRR



Event	Time of performance	Expected result
JSC "PA ECP"		
Reducing the fleet of refrigeration machines filled with freon-12, per unit	2017	Reduction of Freon-12 emissions by 0.2 tons in 2017 relative to 2016
Modernization of the cooling system for the separation production and conditioning of the uranium enrichment shop:	2017	Reduction by 0.5 million m3 of industrial water consumption in 2017 relative to 2016
Modernization of general exchange and gas-cleaning ventilation in the chemical shop (bld.3)	2018	Increase in energy efficiency of production. Reduction of energy consumption, with full implementation of the project by 2018.
Construction of a specialized storage facility for solid radioactive waste	2020	The organization of a safe method for storing radioactive waste for the environment and the population
JSC "UEP"		
Creation of a repair area for defective tanks in the building 302 of the machinery revision workshop	2017-2018	The safety of long-term storage of packaging kits with depleted uranium hexafluoride
Modernization of atmospheric air control posts on the territory of JSC "UEP" industrial sites and in the residential zone of Novouralsk	2017	Improving the monitoring system for emissions into the air

Fuel Company proposals in the Action Plan of the Rosatom State Atomic Energy Corporation to reduce the negative impact of the industry's organizations on the environment for the activities financed from the IRR



Event	Time of performance	Expected result
JSC "UEP" (contd.)		
Technical re-equipment of the non-ferrous metal remelting site in building 302 of the machinery revision workshop	2017-2018	Ensuring environmental safety in the management of radioactive waste
PJSC "MSZ"		
Creation of a system for collection, cleaning and preparation of industrial water for use in the technical water supply of PJSC "MSZ" in storm sewage releases № 3a, 4a, 5, 6, 9, 11	2018	Stopping the discharge of industrial water into the open water network, cleaning and using them in the system of technical water supply instead of river and artesian water
Reconstruction of the water supply system at PJSC "MSZ"	2017	Reducing the consumption of artesian water
Modernization of the lighting system in the divisions	2017	Reduction of electricity consumption
Creation of a section for processing liquid radioactive media	2018-2020	Reducing the formation of radioactive waste
Reconstruction of technological ventilation in production buildings of the plant	2017-2020	Reduction of emissions of pollutants (radionuclides) into the atmosphere

Fuel Company proposals in the Action Plan of the Rosatom State Atomic Energy Corporation to reduce the negative impact of the industry's organizations on the environment for the activities financed from the IRR



Event	Time of performance	Expected result
PJSC "Kovrov Mechanical Plant"		
Equipment of the exhaust ventilation system from the galvanic rows with gas purification plants	2018	Reduction of the level of air pollution
Equipment of the territory of water intake facilities with drainage sewage system	2019	Prevention of pollution of the underground aquifer
Reconstruction of water intake facilities	2020	Prevention of pollution of the underground aquifer
JSC BOCHVAR «VNIINM»		
Introduction of energy-saving equipment, replacement of morally and physically obsolete equipment, filters in gas-cleaning systems within the framework of the implementation of the investment project "Modernization of special ventilation"	Until 2019	Introduction of technologies, equipment aimed at the rational use of natural resources
JSC CMP		
Reconstruction of lighting network in buildings 450 and 703 of shop 60 with installation of LED lighting fixtures	2017-2018	Reducing the amount of generation of Class I waste

Fuel Company proposals in the Action Plan of the Rosatom State Atomic Energy Corporation to reduce the negative impact of the industry's organizations on the environment for the activities financed from the IRR



Event	Time of performance	Expected result
PJSC "NCCP"		
Acquisition and commissioning of a modular soil demercurization unit	2019	Bringing the territory of the enterprise to the required level of safety in terms of the content of mercury in the soil
Installation of sewage treatment plants on storm water sewerage	2017	Reduction in the flow of pollutants to the storm water sewerage
Modernization of the gas cleaning section in the production of lithium metal	2018	Reduction of pollutant emissions
Establishment of a complex treatment site for liquid and solid radioactive waste	2020	Reducing the amount of radioactive waste and stopping the discharge of radioactive waste into the tailings pond

The main results of the environmental policy of JSC TVEL and experience gained by the Fuel Company protecting the nuclear and radiation hazardous facilities



2010. Nuclear facility KhMS decommissioned into a "green lawn".



- Built-up area – 2900 m².
- SRW for burial – 1680 m³.



2012. The point of preservation of special radioactive waste of the JSC "SCC" "B-2 pool created.

- Built-up area – 51 400 m²
- Pulp volume – 35 000 m³



2015. VNINM building B decommissioned into a "green lawn".

- Built-up area – 2407 m².
- SRW for burial – 1603 m³.
- The volume of SRW is reduced by 2,57 times.



2015. The point of preservation of special radioactive waste created in place of the JSC "SCC" uranium-graphite production reactor EI-2.

- Upper level + 32 m
- Bottom level - 38 m



2016. PH decommissioned in the laboratory of resource tests of JSC OKB-NN

- Built-up area 1020 m²

