FUEL COMPANY OF ROSATOM

TVEL

ANNUAL REPORT

2018

New Businesses and Products
TVEL Fuel Company
of Rosatom

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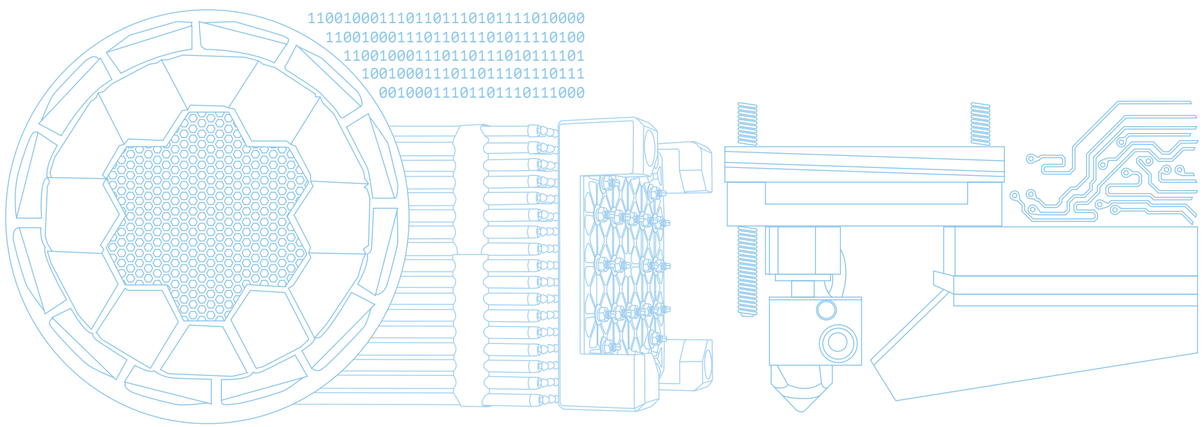

MESSAGE FROM THE CHAIRMAN OF THE BOARD OF DIRECTORS

Tvel fuel company plays an important role in promotion of Russian nuclear technologies abroad, working in the global market both within Rosatom integrated offer, or directly with operators of NPPs of Russian and foreign design

DEAR COLLEAGUES AND FRIENDS,

Nuclear Fuel Division of Rosatom State Corporation, managed by TVEL JSC, has key importance for consolidated financial indicators of the Russian nuclear industry, achievement of the strategic goals set by Rosatom both for Russian and the global markets, and accomplishment of the largest projects for nuclear power of the 21st century.

In 2018, the company showed consistently high production and financial performance, and also reached new heights in all key areas. A number of major contracts with foreign customers have been signed, new designs and modifications of nuclear fuel are being actively developed and implemented. The Company obtained certain results in creation of fundamentally new fuel products for Rosatom, in particular, the first test samples of Russian accident-tolerant fuel for light water reactors, as well as the world's first batch of MOX fuel for fast neutron reactors.

Relating to the development of non-nuclear businesses, TVEL Fuel Company was the first in the nuclear industry to introduce integrator companies in such new areas as additive manufacturing and power storage. It is significant that Rosatom may become both a major customer of such products and a leading player in the emerging Russian market.

Rosatom State Corporation is committed to the UN Sustainable Development Goals in all its operations, and the Fuel Division contributes to the achievement of several at once, such as Affordable and Clean Energy, Responsible Consumption and Production, Sustainable Cities and Towns, Decent Employment and Economic Growth, etc. Thus, the effective implementation of numerous projects by TVEL Fuel Company helps not only to solve the strategic tasks of the Russian nuclear industry, but also to confront global challenges.

Yuri Olenin,
Chairman of the Board of Directors of TVEL JSC

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MESSAGE FROM THE PRESIDENT

The year 2018 was marked by stable and successful growth in TVEL Fuel Company of Rosatom.
Due to professional and coordinated teamwork the Company managed to achieve new significant results in the global nuclear fuel market.
The ten-year export orders portfolio for nuclear products reached USD 13.3 billion

DEAR COLLEAGUES,

Continuous improvement of nuclear fuel, development and introduction of new designs and modifications allow offering the fuel with advanced technical and economic characteristics to our traditional customers. In 2018, the Company signed an agreement on new modified fuel introduction at Loviisa NPP for VVER-440 reactors, supplied the fourth generation TVSA-T. mod.2 fuel for loading into Temelin NPP, and completed resource testing of the new fuel assemblies for the customers in Finland and Hungary.

TVEL develops innovative nuclear fuels that will help to achieve a new level of NPPs operation safety, and ensure economically efficient use of raw materials. It stands to mention manufacturing of the first experimental fuel assemblies with accident-tolerant nuclear fuel for VVER and PWR.

The Company managed to achieve obvious results in the implementation of the Proryv (the "Breakthrough") project – one of the most important and promising projects of the Russian nuclear industry, which is included in the national Atomic Science, Engineering and Technology project.

At the end of 2018, the Main State Expert Review Board issued a positive decision regarding the project documentation on power unit with BREST-OD-300 reactor facility. All main process equipment has already been delivered to the site in order to start the installation work in 2019.

An important achievement is also launching the world's first batch production of mixed uranium-and-plutonium MOX-fuel for BN-800 fast neutron reactor. These technology and production floor were developed under the coordination and scientific supervision of TVEL Fuel Company. This milestone is also of strategic importance for closing nuclear fuel cycle.

Signing of the contract for production and delivery of nuclear fuel for CFR-600, China's flagship project in fast reactors, will be another contribution of TVEL Fuel Company in development of the dual-component nuclear power.

In 2018, the Company gave a fresh impetus to support the development of non-nuclear businesses. The newly formed nuclear industry integrators, incorporated within

the Fuel Division, started full-scale operations in such new areas as additive manufacturing and power storage. The two new companies have already formed a portfolio of orders and launched the first commercial projects. Total revenues from non-nuclear businesses amounted to RUB 13.5 billion in 2018.

Development of new ideas is facilitated and promoted by the business accelerator launched in 2018, which can help to develop a project from the idea stage to industrial implementation just within nine months. According to the results of the first round of acceleration, three projects on additive manufacturing and equipment for the energy complex have received funding in 2018. The decision has already been made to replicate this experience within the whole Russian nuclear industry.

In the regions of operation TVEL successfully launched the business partnership program together with regional authorities. Working in close cooperation with the regional administrations, the Company prepared and approved five road maps for the development of business partnerships, started collaborative engagement with 77 new partners, 26 projects under review are assessed as promising. All these projects will give a start to promising high-tech businesses and create new jobs.

TVEL Fuel Company gives priority attention to the sustainable development of the cities and the regions of its presence. In 2018, the investment in environmental protection amounted more than RUB 2.2 billion. The problem of mitigation the environmental impact is solved not only through the use of resource-saving technologies. Over the past year, we succeeded in reducing the total amount of production and consumption waste by more than 23%. The Company's contribution to the environment preservation is not limited to the use of resource-saving technologies. Major efforts are applied for tackling the "nuclear legacy" issues. The Company is engaged in the rehabilitation of industrial sites to their original state.

Developing its operations TVEL Fuel Company adheres to socially oriented policies that meet the needs of residents of the cities of presence. It is important for us to create comfortable and safe urban environment, provide favourable conditions for the life and work of our employees and their families, improve the conditions and quality of life of people in Russian regions. In 2018, the cities of presence of the Company's enterprises received RUB 1.8 billion to support important social projects.

Regarding the year 2019, we plan to continue the development and introduction of new types of fuel, strengthen our positions in foreign markets and develop all numerous areas of our diversified business. The Company's efforts will be focused on minimizing the time for development and commercialization of new products. We are not afraid of large-scale and promising projects. Because only the most daring undertakings become the engine of business development.

Natalia Nikipelova,
President of TVEL JSC

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KEY RESULTS OF TVEL FUEL COMPANY

Net income

49,204 RUB million

2017: 55,008 RUB million

2016: 46,212 RUB million

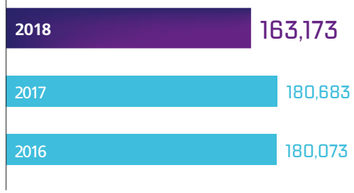
EBITDA margin

39.9%

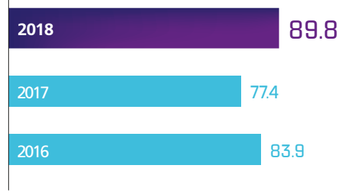
2017: 41.5%

2016: 43.0%

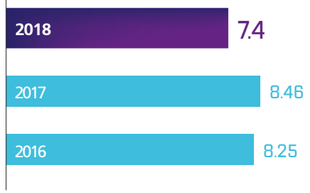
-9.6% Revenue (net) from the sales, RUB million



+16.0% Adjusted free cash flow, RUB billion



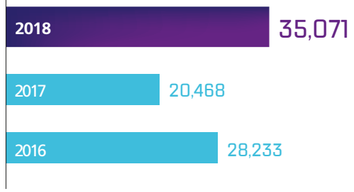
-12.5% Labor efficiency*, RUB million/person



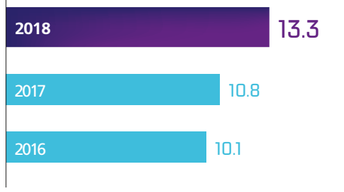
+3.0% Average staff number, persons

* Labor efficiency is calculated as revenue from sales + recognition of costs carried out by external financing / average number of employees.

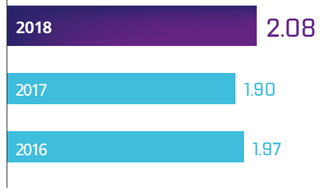
+71.3% Dividends paid in the reporting year, RUB million



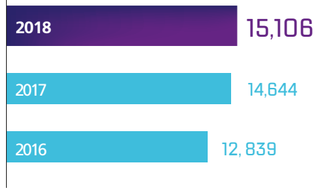
+23.2% Foreign orders portfolio for products and services of FE NFC for a 10 year period, USD billion



+9.5% Total costs for occupational safety and health measures, RUB billion



+3.2% Gross tax liabilities (actually paid), RUB million



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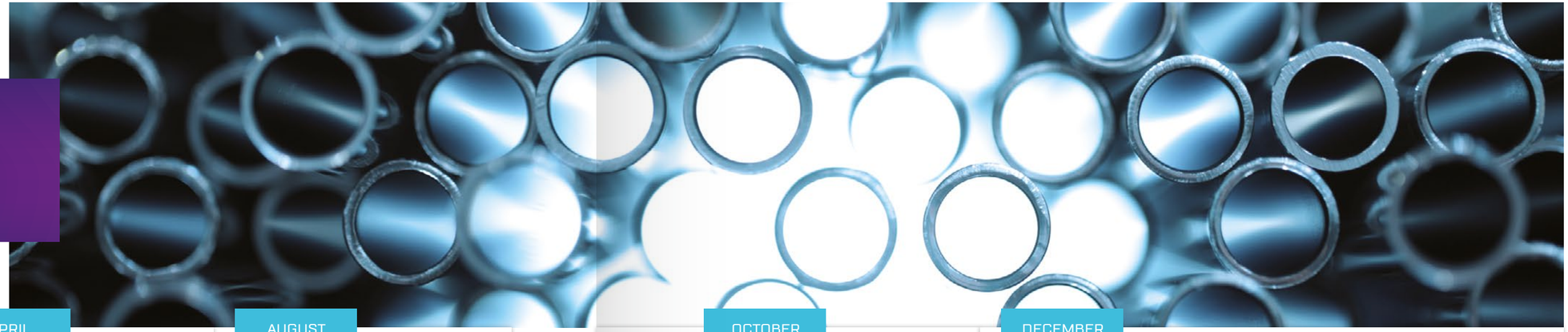
2018 MILESTONES



JANUARY

BULGARIA:

The contract documents for nuclear fuel supply to Kozloduy NPP in 2018–2020 enter into force

FINLAND:

Contracting with Fortum Power and Heat Oy for development of a new modification of nuclear fuel with increased uranium capacity for VVER-440 in Loviisa NPP

FEBRUARY

RUSSIA:

Rusatom Additive Technologies (RusAT LLC), the nuclear industry integrator company for additive manufacturing business, starts operations as a subsidiary of TVEL JSC

APRIL

RUSSIA:

Implementation of the quality management system NQA-1 in TVEL JSC and in a number of enterprises of the Fuel Company

JUNE

UZBEKISTAN:

Supply of nuclear fuel to the recommissioned research reactor at the Institute of Nuclear Physics of the Academy of Sciences of Uzbekistan

JULY

RUSSIA:

TVEL Fuel Company starts business accelerator for start-ups and new ideas development

AUGUST

CZECH REPUBLIC:

The fourth generation TVSA-T.mod.2 fuel with enhanced reliability and uranium capacity is loaded into VVER-1000 reactor of the power unit No. 2 at Temelin NPP in the Czech Republic

RUSSIA:

Chepetsky Mechanical Plant starts production of the new product – hafnium oxide

SEPTEMBER

RUSSIA:

The first batch of TVS-2M fuel with the second generation anti-debris filter ADF-2 (protects fuel from damage and depressurization) is first time loaded into VVER-1000 reactor at power unit No. 1 of Rostov NPP

RUSSIA:

Loading of nuclear fuel into the reactor installations of the world's first floating NPP Academic Lomonosov

OCTOBER

SWITZERLAND:

TVEL JSC and European Organization for Nuclear Research (CERN) sign an agreement to conduct R&D for superconducting materials as part of the Future Circular Collider (FCC) project. In October, Chepetsky Mechanical Plant proceeded to pilot production of superconducting strands for FCC

NOVEMBER

RUSSIA:

Novosibirsk Chemical Concentrates Plant produces and successfully passes quality check for the initial nuclear fuel loading of power unit No.1 of Belarus NPP

DECEMBER

RUSSIA:

Kovrov Mechanical Plant completes the investment project "New Facility for Gas Centrifuges Production"

RUSSIA:

TVEL Fuel Company of Rosatom starts production of new generation gas centrifuges stable isotopes separation

RUSSIA:

Start of industrial production of mixed uranium-and-plutonium MOX-fuel for BN-800 fast neutron reactor

RUSSIA:

First experimental fuel assemblies of Russian accident-tolerant fuel are manufactured for the further testing at MIR research reactor

INDIA:

Signing the contract for fuel pellets supply to Tarapur NPP in India

CHINA:

Signing of contract for nuclear fuel supply to CFR-600 fast neutron reactor in China

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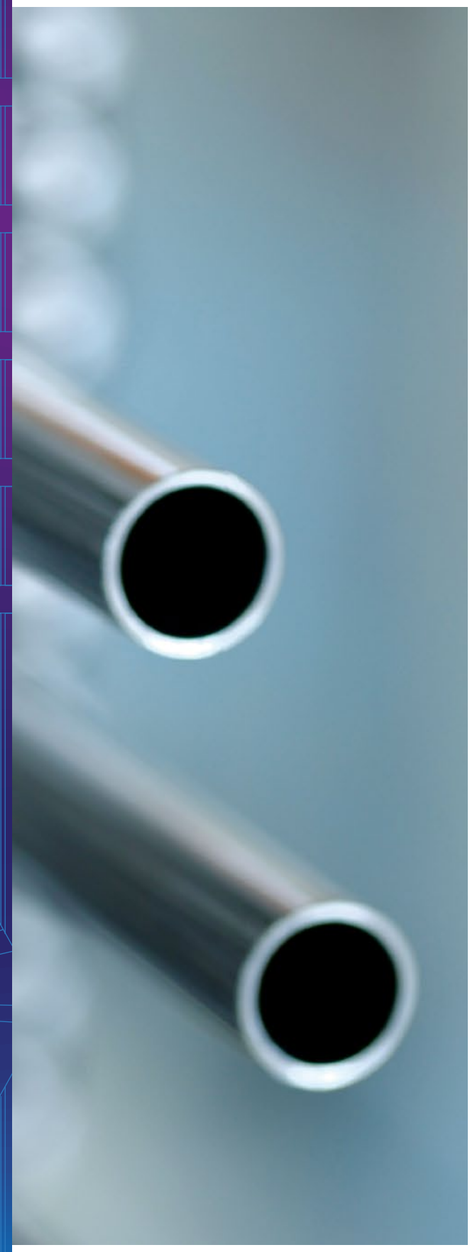
OVERVIEW OF TVEL FUEL COMPANY



ABOUT THE COMPANY

Today TVEL Fuel Company* provides nuclear fuel to 76 energy reactors in Russia and 14 countries of Europe and Asia, these installations annually produce more than 400 billion kWh of electricity

* Collective name for TVEL JSC and its subsidiary companies.

TVEL Fuel Company of Rosatom (hereinafter referred to as TVEL Fuel Company, TVEL FC, the Company) is one of the major players on the global market of front end nuclear fuel cycle and the only nuclear fuel supplier to Russian NPPs.

Consolidating the assets of the Fuel Division of Rosatom State Corporation, the Company includes the enterprises specialized in fabrication of nuclear fuel, uranium conversion and enrichment, production of gas centrifuges, as well as research, design and development organizations.

Based on the expertize accumulated for the years of nuclear production development, the Company preserves the regularity of pace in development of non-nuclear businesses. TVEL Fuel Company supplies to Russian and foreign markets a wide range of non-nuclear products and services in such areas as chemistry, metallurgy, energy storage, mechanical engineering and additive technologies.

An optimal organizational format to develop non-nuclear businesses for the Company is the creation of industry specific integrators.

All stages of activity comply with the strict requirements regarding nuclear and radiation, industrial, fire, environmental safety, as well as labor safety, physical protection of nuclear facilities and nuclear materials, emergency preparedness

The enterprises of TVEL Fuel Company are located in 10 regions of the Russian Federation, which renders effective cooperation with partners in a wide range of issues and areas.

Specific nature of the social environment where TVEL Fuel Company operates is the presence of industrial enterprises within the closed administrative territorial units (CATU): Seversk, Novouralsk, Zelenogorsk, and within the mono-town Glazov. These enterprises are town-forming organizations and major taxpayers.

One out of every 6 power reactors in the world operates on the fuel manufactured by the Company

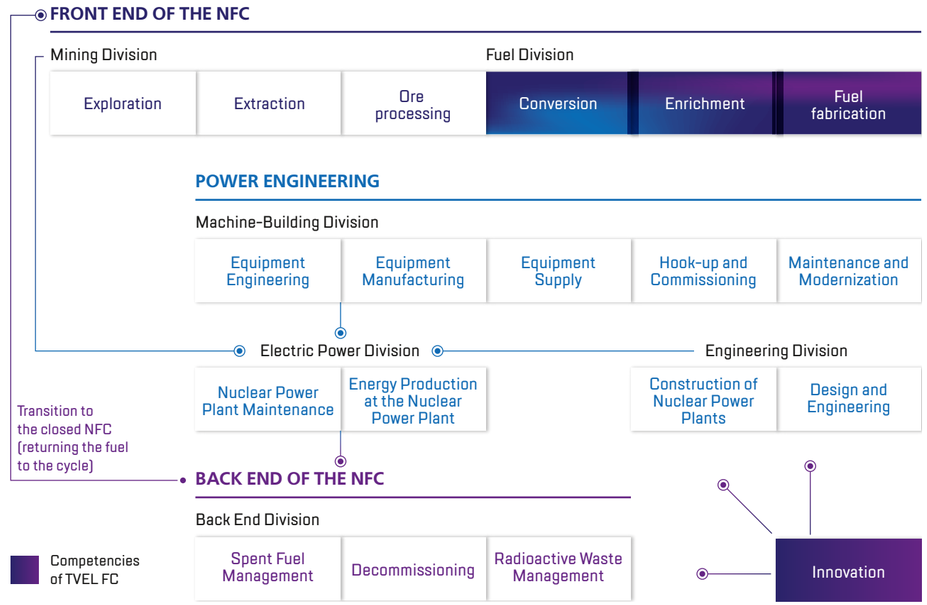
SCHEME 1

Competitive advantages of TVEL Fuel Company

Cost optimization and production compaction	– increase of price competitiveness by optimizing costs – production concentration – optimization of duplicate functions – divesting non-core assets – development of new and low waste technologies – technological development
Package supplies	– Possibility of improving the characteristics of nuclear fuel (due to the fact that the Company's framework concentrates all technological stages of nuclear fuel production) – increase of price competitiveness
Continuous improvement of consumer properties of nuclear fuel	– provision of load following mode, possibility of increasing reactor capacity – extended fuel life and cycles – high nuclear fuel burn-up
Use of various types of raw materials	– increase of commercial attractiveness of fuel – decrease of nuclear fuel share in power generation cost kWh
Reference fuel	– proposal of reference solutions which have been tested and qualified in Russia

SCHEME 2

Position of TVEL Fuel Company in nuclear technological chain



TVEL FUEL COMPANY

10 THE ENTERPRISES OF TVEL FUEL COMPANY ARE LOCATED IN 10 REGIONS OF THE RUSSIAN FEDERATION

1. Moscow
TVEL JSC, VNIINM JSC, MZP JSC, CPTI JSC

2. Moscow region
MSZ JSC (Elektrostal)

3. Saint Petersburg
Centrotech SPA LLC

4. Vladimir region Tochmash VPA JSC (Vladimir), KMZ JSC (Kovrov)

5. Udmurt Republic
ChMP JSC (Glazov)

6. Sverdlovsk region UEIP JSC, Centrotech SPA LLC (Novouralsk)

7. Novosibirsk region
NCCP JSC (Novosibirsk)

8. Tomsk region
SGChE JSC (Seversk)

9. Krasnoyarsk territory
PA ECP JSC (Zelenogorsk)

10. Irkutsk region
AECC JSC (Angarsk)

WORLD MARKET OF FRONT END NUCLEAR FUEL CYCLE

According to IAEA PRIS, as of the end of 2018 there were 451 NPP power units in operation worldwide, including 37* in the Russian Federation

76 reactors
are running on the Russian fuel

* Taking into account the decommissioned power unit No.1 in Leningrad NPP and power unit No. 1 in Bilibino NPP.

The highest number of operating power units are located in Asia-Pacific region, North America and Western Europe. At the moment 55 power units are under construction in 18 countries of the world.

FABRICATION MARKET

At the moment, more than 80% of the world reactor fleet consists of light water reactors (LWR), including PWR, BWR and VVER reactors. It is expected that within the next ten years LWR will amount to about 90% of new reactors put into operation.

Major foreign manufacturers of fuel for light water reactors are located in USA, Western Europe and Japan:

- Framatome (75.5% share belongs to EDF) – BWR and PWR;
- Global Nuclear Fuel (joint venture of GE and Hitachi) – BWR;
- Westinghouse (owned by Brookfield Business Partners) – BWR, PWR and VVER.

TVEL Fuel Company is the main supplier of fuel for reactors of Russian design.

DIAGRAM 1

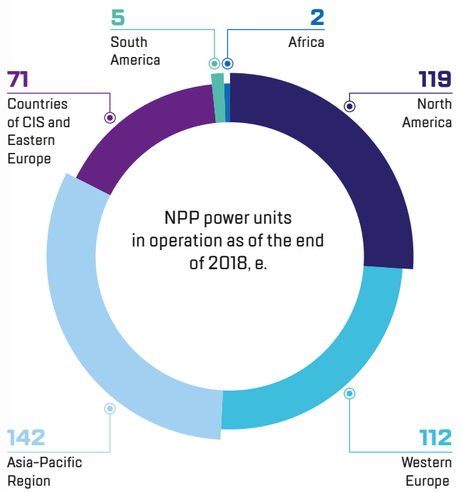
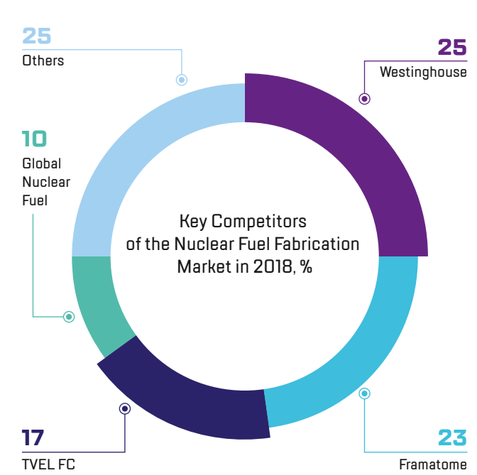


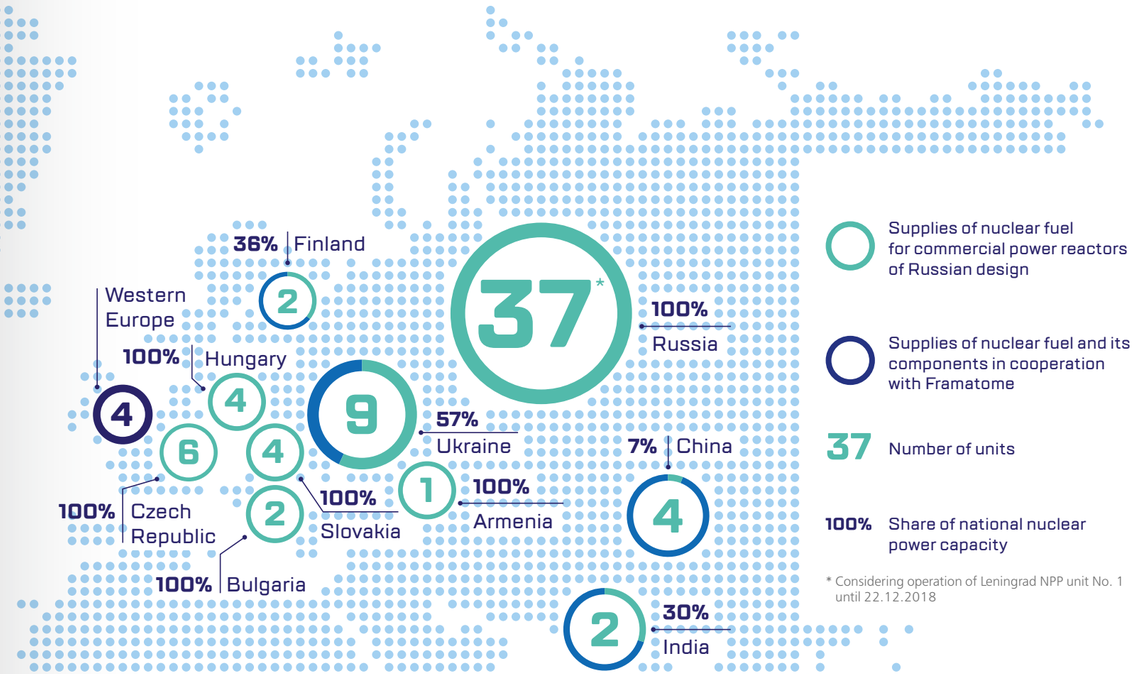
DIAGRAM 2



POSITION ON THE GLOBAL MARKET

17%

TVEL Fuel Company's share of the global fuel fabrication market



URANIUM CONVERSION AND ENRICHMENT MARKETS

During the first half of the reporting period, the price for conversion continued its decline which began in 2011, which is due to the surplus production facilities and presence of significant nuclear fuel reserves in various forms that resulted in excess of conversion and enrichment services over the current demand in the market. In recent years because of the current market conditions most suppliers of conversion and enrichment services do not use their production capacity to the full, and tend to reduce the volume of output or suspend the production completely.

The lowest SWU (separative work unit) price indicators on the spot market – USD 34 per SWU – were recorded in the middle of 2018, then for the first time since 2010, their growth began. By the end of 2018, the SWU spot market price returned to the level of the end of 2017 – USD 39 per SWU*.

* Data obtained from UxC.

MARKET OUTLOOK FOR FRONT END NUCLEAR FUEL CYCLE

Front end nuclear fuel cycle market outlook depends on the current state of the reactor fleet and periods of its operation, plans for construction of new units, as well as the reserves of FE NFC accumulated by various market players. According to different scenarios in 2030 outlook, the nominal capacity of the global reactor fleet will increase, the difference is in growth rate.

The Asian region remains the most promising market where the main construction of new units is in progress and there are serious plans to build up the nuclear facilities. The demand is expected to reduce in FE NFC markets of Europe and North America due to ageing of the reactor fleet, decommissioning of the existing facilities and small quantity of new projects aimed at replacement of the retired facilities.

POSITION OF THE COMPANY IN THE WORLD MARKET OF THE FRONT END OF NUCLEAR FUEL CYCLE

TVEL Fuel Company is one of the global leaders in nuclear fuel production.

TVEL Fuel Company is the main supplier of fuel for reactors of Russian design, as well as it is sufficiently competent to produce nuclear fuel for PWR and BWR reactors and its components from reprocessed uranium (in cooperation with Framatome), and pellets for BWR and PHWR reactors. TVEL Fuel Company elaborated its own in-house design of fuel assemblies (FA) for PWR reactors – TVS-K fuel, which is under the pilot operation.

TVEL Fuel Company jointly with TENEX JSC provides more than 1/3 of the needs in uranium enrichment services.

In 2018, the Company continued to work in difficult external conditions, facing a number of new challenges. The nuclear power industry in the world developed at a slower pace compared to previously made forecasts. Facilities surplus and low prices in the NFC markets remained. In foreign markets the Company had to deal with not always market-based instruments of competitive struggle, expanded protectionism tools.

The initiatives undertaken by TVEL JSC on improvement of technical and economic features of fuel, development of new samples of fuel, including accident-tolerant, make the Company's products more attractive for its customers both on the traditional fuel market for Russian-design reactors, and on the fuel market of Western-design PWR reactors.

OPERATING RESULTS OF TVEL FUEL COMPANY IN THE NFC FRONT END MARKET

The assets of TVEL Fuel Company include all process cycles of nuclear fuel fabrication which makes it possible to offer products and services related to FE NFC in the form of package supplies

Implementing an integrated approach to work in the world market of FE NFC, the Company takes into account the current and perspective market trends and challenges in own production activity. The result of this is the flexibility of contract pricing and optimal transport logistics, while the reliability of supply is ensured by the presence of several enterprises specializing in various areas of FE NFC.

Within the framework of international obligations, TVEL Fuel Company complies with the legislative requirements established by supervisory authorities of the Customer's country and which are necessary for licensing of nuclear fuel and components for reactor core.

Within the framework of international obligations for 2018, the Company obtained 74 licenses from Federal Service for Export Control of Russia (60 export and 14 import licenses), 3 license-free export approvals received under the article 20, 3 Russian import certificates, and conducted 10 identification examinations (6 — in FGUP Gostekhstroi and 4 — CEK LLC) and one — in the applied research and export control laboratory. Additionally, 1 certificate of specialist in the field of export control was obtained

TABLE 1

Key indicators of TVEL Fuel Company in the world market of the front end nuclear fuel cycle in 2018

KEY INDICATORS	VALUE
Export proceeds, USD mln	961
Export orders portfolio for products and services of FE NFC for a 10 year period, USD bln	13.3

RESULTS OF EXISTING AGREEMENTS AND CONTRACTS:

- in 2018, the Company provided fuel supplies under all existing contractual obligations with observance of all deadlines;
- continued cooperation with foreign energy companies and industrial partners with the view of promoting TVS-K fuel;
- continued cooperation with Framatome on producing at MSZ PJSC existing facilities nuclear fuel and components from reprocessed uranium according to Framatome technology for European NPPs with PWR;
- the joint Kazakh-Russian uranium enrichment centre carried out all the events planned for the year, including the delivery of products under the concluded contracts;
- start-up of the contract documents for nuclear fuel supply to Kozloduy NPP (Bulgaria) for the period 2018—2020.

MAJOR AGREEMENTS AND CONTRACTS SIGNED IN 2018:

- fuel pellets supply contract for Tarapur NPP (India) with BWR reactors;
- opening of a new international transport corridor for Russian nuclear fuel supplies to the markets of Eastern Europe;
- above-plan delivery of initial fuel loading to power unit No.7 of Novovoronezh NPP;
- fuel supply to CFR-600 reactor (China);
- a series of contracts on nuclear fuel components supply for research reactors, including to Egypt.

GOALS AND PLANS IN THE MIDTERM:

- increasing customer focus and maximum satisfaction of customer requirements;
- fuel improvement and development of new samples, including accident-tolerant fuel;
- protection and strengthening of the position in the traditional nuclear fuel markets, implementation of the annual supply program;
- implementation of the existing contracts, development of cooperation with foreign energy companies and industrial partners with the view of promoting TVS-K fuel at target markets;
- expanding the range and geography of fuel supplies and its components for research reactors of foreign design.

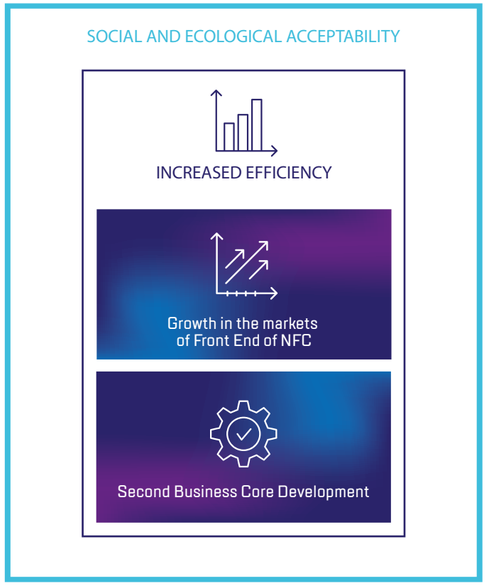
DEVELOPMENT STRATEGY

Mission of TVEL FC is to meet the requirements of the customers of Rosatom TVEL Fuel Company both in the field of nuclear fuel cycle and in the related sectors, in strict compliance with requirements of safety, security, environmental and social awareness

Development strategy and business plan of TVEL Fuel Company for the years 2015–2019 were adopted by the Strategic Board of Rosatom in December, 2014. The strategy of TVEL Fuel Company sets core performance indicators for mid-term and long-term outlook till 2030.

SCHEME 3

Strategic targets of TVEL Fuel Company



STRATEGIC VISION:

Fuel Division is the global leader in front end of NFC and the related fields

TVEL Fuel Company faces **the challenge to increase its presence in the world market of NFC fabrication up** to 22% and preservation of more than one third of the enrichment world market by the year 2030 (including supplies through TENEX JSC). Leadership of TVEL Fuel Company in the NFC market will be ensured by a series of projects being accomplished. First of all, such projects include promotion of the Russian design TVS-K fuel onthe foreign market (for reactors designed abroad).

One of the innovative areas for NFC market is the Proryv project ("Breakthrough") at the facilities of SGChE JSC (CATU Seversk, Tomsk region), with the construction of the Experimental Demonstration Energy Complex (EDEC), which includes fuel fabrication / refabrication module, power unit with BREST-OD-300 reactor, and spent nuclear fuel (SNF) reprocessing module.

Furthermore, with the view of FE NFC market growth TVEL Fuel Company:

- carries out projects to develop innovative fuel types, including uranium and plutonium based and accident-tolerant fuels;
- carries out projects on improvement of nuclear fuel consumer properties for operating NPPs;
- develops cooperation with existing and new partners.

TABLE 2

Goals correlation of Rosatom and TVEL Fuel Company

Strategic goals of TVEL Fuel Company	Strategic goals of Rosatom State Corporation: 1. Increase of the international market share	2. Reduction of the cost of products and the lead time	3. New products for Russian and international markets	OPERATIONAL ENVIRONMENT Prevention of adverse environment impact
Growth on NFC Markets	◉		◉	
Second Business Core			◉	
Development Effciency		◉		
Improvement Social and Ecological Acceptability				◉

The key conditions for **the development of the second core** business is the presence in TVEL Fuel Company of the necessary infrastructure and production facilities, as well as the required equipment, licenses and qualified staff.

Financial stability of the Company is achieved through the development of non-nuclear business in conditions of challenges and changing market environment in FE NFC markets, additional workplaces are created. In 2018, TVEL Fuel Company created a series of industry-specific integrators on new businesses.

The Company faces the target to increase the revenue in non-nuclear businesses (including established businesses) more than 10 times in comparable terms of 2014.

Within the framework of **efficiency improvement**, the priority is given to solving the tasks of compacting the production areas and activity optimization.

In 2016, the territory of SGChE JSC concentrated the conversion redistribution (uranium conversion was transferred from AECC JSC and ChMP JSC). Concentration of production facilities of Tochmash VPA JSC and KMZ PJSC began in 2017.

Performance management objectives include increasing productivity, reducing costs and optimizing resources.

The main priorities are still **careful attitude to the environment**, transfer of "clean" areas after nuclear production to future generations, introduction of non-waste technologies and reduction of the "nuclear legacy".

In terms of **ensuring social acceptability**, TVEL Fuel Company is one of the successful examples of social and charitable programs (support and development of small and medium-sized business in cities, creation of new jobs, improvement of cities, etc.) in the territories of Rosatom State Corporation presence. In 2018, the Company signed several cooperation agreements with the heads of the regions of presence in order to develop business partnerships.

Strategies developed and approved during 2018:

- **15 country-oriented strategies** (Czech Republic, Hungary, Bulgaria, Slovakia, Finland, Sweden, Uzbekistan, Turkey, Kazakhstan, Egypt, Belarus, India, Spain, USA, Korea);
- **7 product strategies** (decommissioning, export zirconium for nuclear applications, oilfield services, IT, small atomic clocks, energy storage, additive technologies)

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TABLE 3

Contribution of the results 2018 in achievement of the strategic goals of TVEL Fuel Company

TARGET: GROWTH ON NFC MARKETS		
Project	**Results**	**Effect**
TVS-K program	– Implementation of the quality management system NQA-1 in TVEL JSC and in certain production enterprises of TVEL JSC – Production of TVS-K models	Market development
Production design and development of technology for closed nuclear fuel cycle	– For the first time in Russia TVEL JSC participated directly in manufacture and successful acceptance tests of FA BN-600 with MOX-fuel at FSUE MCP – Russia and China signed an intergovernmental agreement on concerted efforts under CFR-600 project, and a contract for CFR-600 fuel supply was concluded in December 2018 – Rosatom State Corporation decided to elect SGChE JSC as the operating organization of all EDEC objects, including reactor plant. – The Company delivered to SGChE JSC all main process equipment for MNUP fuel production	Development prospects
Promotion of fuel components produced using Russian and foreign technologies to the global market	– Signing of the contract for nuclear fuel components supply to research reactor ETRR-2 located in Egypt. The contract was completed before the end of 2018	Market development
Design and improvement of nuclear fuel and reactor cores for nuclear power units	– Completion of licensing and start of operating TVSA-T.mod.2 fuel at power unit No.2 of Temelin NPP – First experimental fuel assemblies were manufactured with Russian accident-tolerant fuel for VVER and PWR – Completion of licensing and start of fuel operational testing for VVER-1000 (TVS-2M design) with a second generation anti-debris filter in Rostov NPP – Completion of resource tests of FA models and work assemblies of VVER-440 with optimized water-uranium ratio for Paks NPP (Hungary) and Loviisa NPP (Finland)	Market retention

TARGET: SECOND CORE BUSINESS DEVELOPMENT		
Project	**Results**	**Effect**
Development of advanced products	– Centrotech SPA LLC and ChMP JSC signed a contract for development and production of polymeric reusable containers protecting from mechanical and climatic damage during transportation of zirconium products made by ChMP JSC – Launching of the project to create a universal plasma cutter for oilfield service companies – Start of developing a technology and technical equipment for a new type underwater laser cutting without using a gas working medium for works at all depths, and specifically when handling radioactive materials and devices and cutting them in water pools	Entering new markets
Creation and development of new businesses	– Launching of 2 branch integrators on new areas – Additive Technology and Energy Storage – Printing of the first sample demonstrators on a metal powder 3D printer in UEIP JSC – Start of electricity storage system supplies for internal electric transport, including to external customers – Final supply of polycrystalline silicon 28Si within the framework of the international project for creation of new generation mass standard "Kilogram-3" – ChMP JSC signed a contract for calcium wire large-scale supplies with the leading Russian steel and rolled metal producer – Commissioning of a complex facility for lithium-7 hydroxide solutions cleaning from impurities and further obtaining finished products – Signing of an agreement with CERN to develop and supply a qualification batch of superconducting wire under the the Future Circular Collider project	Entering new markets

TARGET: EFFICIENCY IMPROVEMENT		
Project	**Results**	**Effect**
Concentration of production facilities of Tochmash VPA JSC and KMZ JSC	– Completion of transition and commissioning of the mechanical treatment facilities from Vladimir to Kovrov	Efficiency improvement
Concentration of the Company's production facilities	– Development of project documentation for the second stage production of W-ECP to defluorize depleted uranium hexafluoride. The design documentation was examined by Glavgosexpertiza (Main State Expertise of Russia)	
Increasing the efficiency of industrial sites areas use	– Work-out and approval of 9 concepts of sites development in the enterprises included into the management system of the Company – In general, TVEL Fuel Company achieved a reduction in buildings area more than 200 thousand sq. m, reducing the costs for maintenance and operation for more than RUB 300 mln – The Investment Committee of TVEL JSC approved the implementation of the 7 "first wave" compaction projects	
Development of new gas centrifuges	– Completion of development and start of mass production of the new generation gas centrifuges for separation of stable isotopes – UEIP JSC launched production of first sections of the new generation gas centrifuges	
Functions transformation program	– Start of activities on reengineering of functions and outsourcing processes. At the level of Rosatom State Corporation launching of a series of cross-functional processes was approved	
Transformation of equipment and material procurement process	– Reduced warehousing costs for non-uranium materials and resources in the amount of RUB 230 mln – Reduced cost of purchased non-uranium materials and resources in the amount of RUB 430 mln	

Transition to an operational model based on supply chain management	–	Efficiency improvement
Process digitization	– Automation and robotization of the procurement process – Creating a digital twin of the Russian SOBR (Special Rapid Deployment Force) which can reduce the cost of product prototyping – NCCP PJSC develops a typical production management enterprise system (MES) within the framework of creating the Digital Production system – Pilot projects were launched at a number of enterprises to introduce typical functionality of equipment maintenance and repair based on SAP ERP	

TARGET: SOCIAL AND ENVIRONMENTAL ACCEPTABILITY

Project	Results	Effect
Management of nuclear and radiation hazardous facilities (NRHF) decommissioning	– Decommissioning of the radiation source at Centrotech-SPb JSC	Maintenance of environmental security and social awareness in the cities of the Company's presence

SCHEME 3

Factors of long-term business sustainability and cooperation with the customers

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

Rosatom TVEL Fuel Company has long-term experience in supporting and developing "atomic" cities, creating a comfortable and safe environment, providing favorable conditions for human capital growth, improving the quality of life of people and caring for the environment

On 1 January 2016, seventeen Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at an historic UN Summit — officially came into force. The Sustainable Development Goals are unique in that they call for action by all countries, poor, rich and middle-income to promote prosperity while protecting the planet. Countries recognize that ending poverty must go hand-in-hand with strategies that build economic growth and addresses a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

TVEL Fuel Company shares the internationally accepted initiative. We have identified the most relevant SDGs for our activities and actively support their achievement by the world community.

Nuclear fuel produced by TVEL Fuel Company is operated by NPPs that command a large part in total power balance with a tendency to increase . Prime cost of electric power generated using TVEL brand fuel may compete with other types of power plants. The most considerable advantage of NPP is the absence of emissions of aerosols and greenhouse gases in the atmosphere. Today, operating nuclear power plants annually prevent about 1.8 billion tons of emissions. This is a great contribution to the efforts combating climate change.

An important strategic direction of our activity is the development of new businesses outside FE NFC. Today, the annual revenue of TVEL Fuel Company from non-nuclear businesses is about RUB 13.5 bln. We wish to multiply it by the year 2030. This will allow to create new jobs and ensure social stability in the cities of presence. An additional impetus for economic growth comes from the creation of TASED. Developing new businesses, we operate in effective partnership with regional authorities and the local business community.

Public Integrated Report of TVEL JSC was prepared in accordance with the International Integrated Reporting Framework and GRI Standards

Konstantin Sokolov,
Vice-President for Communication, Administration and Energy Efficiency, Chairman of the Committee on Public Annual Reporting of TVEL JSC

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BUSINESS MODEL

The value generated by TVEL Fuel Company involves not only marketable products and increase of profitability of the Company, but also a great variety of economic, social and environmental effects of activities. TVEL Fuel Company activity depends on a great number of external and internal factors, it provides for close cooperation with stakeholders

This cooperation is characterized by the fact that tangible and intangible resources used by the Company (financial, natural, manufactured, human, social and intellectual capitals*), are controlled both by TVEL Fuel Company and its stakeholders. Conversion of capitals in the course of activities is of great importance to the Company and its stakeholders.

Business model describes the activity of TVEL Fuel Company for integrated value creating as a system with circulation of employed capitals, production and business processes, products obtained, services rendered, R&D and contribution to the sustainable development of regions, and with the results recorded. The business model is aimed at achieving the strategic goals through implementation of competitive advantages, and an effective management system (due to achievement of KPI). The business model takes into account the risks typical for the activities of TVEL Fuel Company, possibilities and risk management capabilities.

RESOURCES

- Internal resources
- External resources

FINANCIAL CAPITAL

- Undistributed profits and monetary assets
- Accumulated reserves of TVEL FC
- Consolidated investment resources
- Industry reserves
- Means of the federal target programs
- Loans, credits, subsidies

MANUFACTURED CAPITAL

- High technology production basis
- Position in the global market of FE NFC
- Strong relations with Russian and foreign customers and suppliers
- Competitive and high quality products and services
- Raw and other materials
- Public infrastructure (roads, communication facilities, etc.)

INTELLECTUAL CAPITAL

- Intellectual property assets of TVEL FC
- Global achievements of science and engineering
- Domestic projects and national intellectual resources

HUMAN CAPITAL

- Skills, experience, competencies and capabilities of TVEL FC employees
- Knowledge management system
- Safety culture
- Experts, consultants

SOCIAL AND RELATIONSHIP CAPITAL

- Reputation of the Company and its enterprises
- Recognisable and reputable brand name
- Internal relations of TVEL FC
- Reliable interrelations in supply chain
- Initiatives of the country, Rosatom State Corporation

NATURAL CAPITAL

- Proprietary and leasable land resources
- Water consumption and energy
- Reuse of raw materials and waste, recycling materials
- Nuclear and radiation safety of TVEL FC facilities
- Ecosystem state

MANAGEMENT SYSTEM, RISK MANAGEMENT

ACTIVITY OF TVEL FUEL COMPANY

R&D CLUSTER

DECOMMISSIONING OF NUCLEAR FACILITIES, WASTE DISPOSAL

CORE ACTIVITY

SEPARATION AND SUBLIMATION COMPLEX:
conversion and enrichment of uranium

NUCLEAR FUEL FABRICATION COMPLEX:
creation of FA for nuclear reactors

GAS CENTRIFUGE COMPLEX:
manufacture of gas centrifuges and auxiliary equipment

SECOND CORE ACTIVITY

METALLURGY:
special metallurgy and titanium metallurgy, superconducting materials and super wires

MECHANICAL ENGINEERING:
instrumentation, equipment for NFC and Oil and Gas Industry

CHEMISTRY:
stable isotopes, catalysts, fluorides, lithium and lithium products

ENERGY STORAGE:
energy storage devices based on chemical current sources, electric power generators based on fuel elements, materials for lithium-ion batteries

ADDITIVE TECHNOLOGIES:
3D printers, metal powders for 3D printing, 3D printing services

SUSTAINABLE DEVELOPMENT OF REGIONS OF OPERATION

RESULTS OF CAPITAL TRANSFORMATION

* Key performance indicators (KPI) of the President

Adjusted free cash flow (AFCF), RUB bln*

2018	321.5
2017	308.7

Production plan realization on the core areas of activity, %

2018	100
2017	100

Investments into R&D, RUB bln

2018	1.5
2017	1.2

Average staff number, persons

2018	22,451
2017	21,793

Government orders, %*

2018	100
2017	100

Investments into the development of radioactive waste and spent nuclear fuel treatment technologies, RUB mln

2018	137.7
2017	114.7

FINANCIAL CAPITAL

Proceeds from sales of new products, RUB bln*	Operational costs, RUB bln	Gross tax liabilities in the regions of presence, RUB bln	Charitable contributions and social projects, RUB bln	Expenses related to environment protection, RUB bln	Salaries and other benefits provided to employees, RUB bln
8.3	91.3	15.1	1.8	2.2	29.3
6.12	85.0	14.6	1.9	2.2	27.6

MANUFACTURED CAPITAL

Labor efficiency, RUB mln/person*	New products portfolio for 10 years, RUB bln*	Foreign orders portfolio for 10 years on FE NFC products and services, USD bln*
7.4	23.8	13.3
8.5	5.1	10.8

INTELLECTUAL CAPITAL

Number of new registered intellectual property objects, ea.	Share of innovative products in revenue, %
82	8.3
108	6.1

HUMAN CAPITAL

Percentage of specialists under 35 years old, %	Average training hours per employee	Average salary, RUB	Personnel engagement, %	LTIFR*
20.8	32.8	82,243	82	0.13
21.9	29.7	77,561	83	0.06

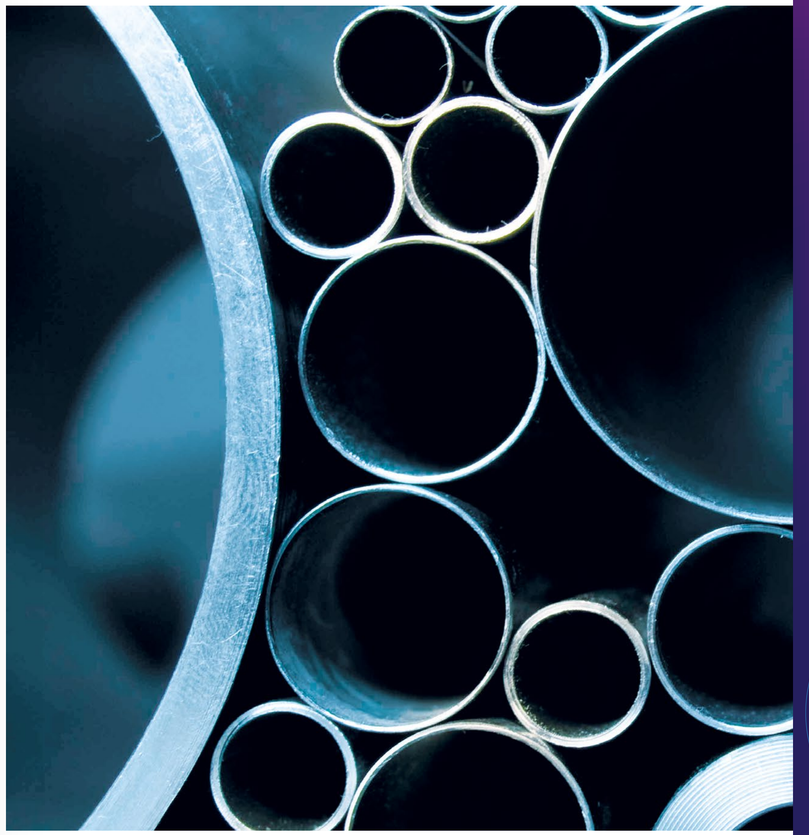
SOCIAL AND RELATIONSHIP CAPITAL

Public procurement, %	Customer satisfaction Index, points	Existing cooperation agreements with regions, ea.
94	4.8	5
97	4.5	0

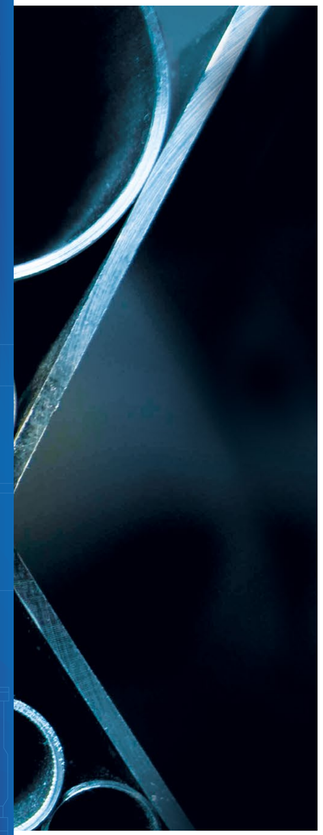
NATURAL CAPITAL

Energy saved

heat energy	electric	Greenhouse gas emissions	No INES events level 2 and above*
306.8	372.7	922.5	0
292.4	367.5	922.6	0



GOVERNANCE



CORPORATE GOVERNANCE PRACTICE

TVEL Fuel Company builds a corporate governance system in full concordance with the standards and requirements of Russian laws, taking into account international standards and in reliance on Rosatom practice which ensures the unity of nuclear industry enterprises management

Corporate governance system of the Company ensures proper management and control of activities, and aims to increase goodwill and sustainable development. Corporate governance is based on effectiveness and operational efficiency.

TVEL JSC is not a Public Joint-Stock company, the Company discloses all the required information on the website of IA Interfax in conformity with the Regulation on Disclosure of Information by the Issuers of Equity Securities on a voluntary basis, assuming no obligations on regular and required disclosure.

The basic documents regulating the activity of the corporate governance system are the Articles of Association of TVEL JSC and the Regulations on the Board of Directors of TVEL JSC.

TVEL JSC puts into practice some provisions of the Corporate Governance Code recommended by the letter dated April 10, 2014 N 06-52/2463 of the Central Bank of Russia, with due regard to specific character of the legal status of Rosatom set by legal regulatory acts of the Russian Federation, providing for unity of nuclear industry enterprises management.

TVEL JSC considers the improvement of corporate governance as an integral part of the work to improve the efficiency and competitiveness of the Company and subject to continuous monitoring by the Board of Directors and the executive body of the Company.

In the reporting year, the improvement of the corporate governance system in TVEL JSC was aimed at improving the effectiveness of governance bodies and preventing the adoption of wrong decisions. Similar plans were also determined for the next year.

The report on the Company's compliance with the principles and recommendations of the Corporate Governance Code will be published in the interactive version of the Annualreport

STRUCTURE OF GOVERNANCE BODIES

The governance bodies are formed in accordance with the Articles of Association of the TVEL JSC. Decisions on the issues referred to the competence of the General Meeting of Shareholders are taken by the sole shareholder of the Company – Atomenergoprom JSC.

The supreme executive bodies of TVEL Fuel Company's subsidiaries are general meetings of shareholders (members), the decision-making of which is determined by internal regulations on these bodies.

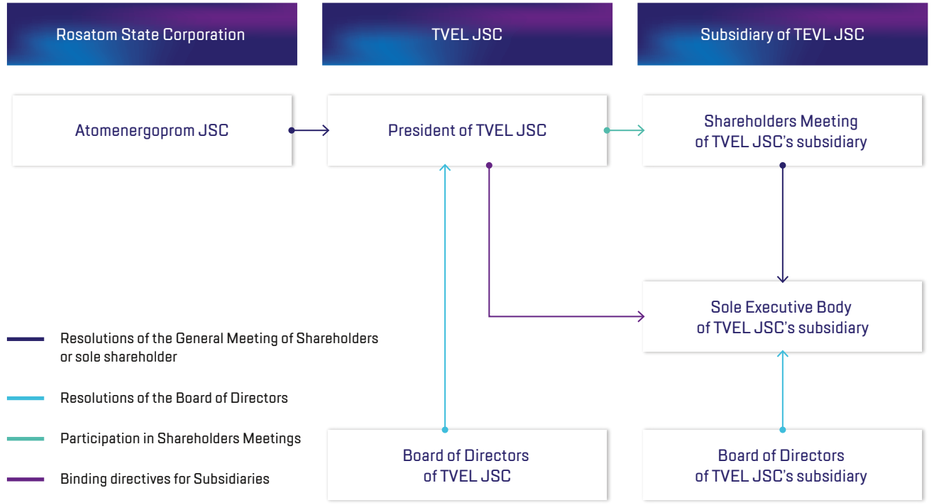
The governance bodies of TVEL JSC and its subsidiaries also include the boards of directors and the sole executive bodies acting on the ground of relevant regulations approved by the general meetings of shareholders.

One of the governance bodies in the subsidiaries of TVEL Fuel Company is audit committees , operating on the ground of relevant regulations approved by the general meetings of shareholders (members).

No committees and commissions operated within the Board of Directors of TVEL JSC during the reporting period.

SCHEME 5

Structure of TVEL JSC corporate governance bodies



Competencies and powers of corporate governance bodies are determined by sections 12, 13, and 14 of the Articles of TVEL JSC

BOARD OF DIRECTORS

The Board of Directors plays a key role in strategic management of TVEL JSC and TVEL Fuel Company in general. The Board of Directors is formed by the Sole Shareholder of TVEL JSC — Atomenergoprom JSC with due regard to qualification and expert knowledge that are required to solve the specified problems.

The Board of Directors consists mainly of outside directors (not the employees of the Company), professionals who have wide experience in the industry and understanding of the specifics of the nuclear industry and the Company activities.

In the reporting period there were no committees and commissions of the Board of Directors.

Members of the Board of Directors are not shareholders of TVEL JSC. In 2018, members of the Board of Directors committed no transactions on acquisition or alienation of the Company's shares. Information on TVEL JSC shareholding must be disclosed by the candidates to the position of the member of the Board of Directors at the time of filling the consent form for election. Biography of the members of the Board of Directors is available in the interactive version of the Report.

There are no independent members in the Board of Directors within the meaning of the Corporate Governance Code of TVEL JSC.

In accordance with the Articles of Association of TVEL JSC the decision on payment of remuneration to the members of the Board of Directors of the Company falls within the competence of the General Meeting of Shareholders (decision of the Sole Shareholder of TVEL JSC — Atomenergoprom JSC).

REPORT OF THE BOARD OF DIRECTORS ON THE RESULTS OF THE COMPANY'S DEVELOPMENT IN THE PRIORITY FIELDS

In 2018, the Board of Directors held 21 meetings and made decisions on the most important issues of TVEL JSC activity, including:

- approval of the budget and scheduled financial-economic indicators of activity of TVEL JSC;
- pre-agreed appointments to the posts directly subject to TVEL JSC President;
- changes in Procurement Regulations;
- approval of recommendations to the Sole Shareholder concerning net income distribution following the results 2017;
- consent to the transaction on real estate rental;
- approval of recommendations to the Sole Shareholder concerning dividend payment following the results of six months of the reporting year;
- approval of recommendations to the Sole Shareholder concerning the new membership of the Board of Directors of TVEL JSC;
- approval of changes in ownership of CPTI JSC, KMZ PJSC, SGChE JSC, contribution to the property of RusAT LLC;
- creation of RusWellGroup JSC.

TABLE 4

Changes in the composition of the Board of Directors of TVEL JSC

COMPOSITION AS OF 01.11.2017	COMPOSITION AS OF 29.06.2018	COMPOSITION AS OF 15.10.2018
- Barabanov Oleg Stanislavovich; - Zalimskaya Lyudmila Mikhaylovna; - Korogodin Vladislav Igorevich; - Nikipelova Natalia Vladimirovna; - Olenin Yuri Alexandrovich (Chairman of the Board of Directors); - Solomon Nikolai Iosifovich.	- Baidarov Dmitri Yurievich; - Zalimskaya Lyudmila Mikhaylovna; - Korogodin Vladislav Igorevich; - Nikipelova Natalia Vladimirovna; - Nikolski Ilya Evgenievich; - Olenin Yuri Alexandrovich (Chairman of the Board of Directors).	- Baidarov Dmitri Yurievich; - Barabanov Oleg Stanislavovich; - Korogodin Vladislav Igorevich; - Nikipelova Natalia Vladimirovna; - Nikolski Ilya Evgenievich; - Olenin Yuri Alexandrovich (Chairman of the Board of Directors); - Polgorodnik Sergey Igorevich.

No remuneration and compensation of the expenses related to performance of obligations were provided for the members of the Board of Directors of TVEL JSC in 2018. All members of the Board of Directors of the Company get salary according to the place of their primary business.

SOLE EXECUTIVE BODY

In accordance with the Articles of Association and by the Resolution of the Sole Shareholder (No. 40 dated September 25, 2017), and on the ground of the Contract executed with the Company the functions of the Sole Executive Body are performed by the President of TVEL JSC — Natalia Vladimirovna Nikipelova*.

Natalia Vladimirovna holds no shares of TVEL JSC. In 2018, she committed no transactions on acquisition or alienation of the Company's shares. In accordance with the contract concluded between TVEL JSC and the President of TVEL JSC, the amount of remuneration following the year results shall be determined by the resolution of the Board of Directors based on the financial-economic performance of the Company and the key performance indicators (KPI) percentage of the President of TVEL JSC.

* Biographical data are contained in the online version of the Annual Report.

TABLE 5

Achievement of KPI of TVEL JSC President in 2018*

KPI	KPI LEVEL	
	Target value	Actual value
Adjusted free cash flow of Rosatom State Corporation (including AFCF of the Divisions: TVEL+Techsnabexport+Atomredmetzoloto+ Uranium One Group), RUB mln	309.4	321.5
	124.6	133.0
Contribution to EBITDA (FE NFC), RUB bln (TVEL+Techsnabexport+Atomredmetzoloto)	116.0	119.5
Labor efficiency, RUB mln/person (TVEL+Techsnabexport+Uranium One Group)	10.67	11.53
Semi-fixed costs, RUB bln	35.7	35.5
Investment activity integrated efficiency indicator, %	100.0	98.1
Integral indicator for new products, %	100	107.7
Proceeds from sales of new products beyond the profile, RUB bln	8.7	8.3
New products portfolio for 10 years (beyond the profile), RUB bln	5.4	23.8
Integral index of foreign orders portfolio, %	100	107
Foreign orders portfolio for 10 years, USD mln	11,918	13,344
Foreign orders portfolio for lifetime cycle, USD mln	57,480	59,201
Export proceeds, USD mln	839	961
LTIFR and reduction of injuries at industrial sites of the enterprises, including the contractors (of basic level 2017)	0.3/25%	0.08/50%
No INES events level 2 and above	No events	0
State orders, including State Defence Orders, other governmental customers and organizations, %	100	100

* Financial and economic indicators are given in accordance with the consolidated management statements of TVEL Fuel Company.

SHARE CAPITAL STRUCTURE

"Atomic Energy Power Corporation" Joint Stock Company (Atomenergoprom JSC) is the owner of 100% of voting shares of TVEL Joint-Stock Company.

The Company's authorized capital amounts to Twenty-two million nine hundred sixty-one thousand six hundred seventy (22,961,670.00) rubles.

The Company placed registered common shares with nominal value of one (1) ruble per each in the amount of Twenty-two million nine hundred sixty-one thousand six hundred seventy (22,961,670) pieces.

All shares of TVEL JSC are issued in non-documentary form.

No changes were made in the share capital structure in the reporting year.

RELATED-PARTY TRANSACTIONS AND MAJOR TRANSACTIONS

During the period 01.01.2018 till 31.12.2018, TVEL JSC made no transactions classified as related-party transactions.

Provisions of chapter XI of the Federal Law "On Joint-Stock Companies" are not applied to TVEL JSC in accordance with p. 3.12 of the Articles.

TVEL JSC made no transactions classified as major transactions during the period 01.01.2018 — 31.12.2018.

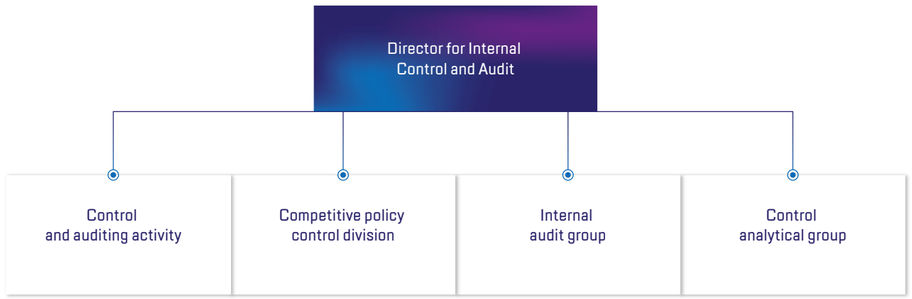
INTERNAL CONTROL SYSTEM

Internal Control System (ICS) of TVEL Fuel Company is an interconnected integral complex of organizational structures, processes, their rules, and characteristics of management system that continuously or from time to time performs internal control function and ensures internal control goal achievement

Specialized body on internal control (SBIC) a subdivision of TVEL Fuel Company's organization engaged in internal control activities with respect to various spheres of business.

SCHEME 6

Structure of TVEL JSC Internal Control System



SBIC of TVEL JSC (the unit of the Director for Internal Control and Audit) operates in accordance with regulatory legal acts of the Russian Federation, local regulations of TVEL JSC and Rosatom State Corporation, and the provisions on these structural subdivisions.

SBICs were created in 9 companies of TVEL Fuel Company: AECC JSC, VNIINM JSC, KMZ PJSC, MSZ PJSC, NCCP PJSC, SGChE JSC, UEIP JSC, ChMP JSC.

Since September 2012, the Arbitration Committee operates in TVEL JSC; the Arbitration Committee is vested with authority to consider complaints against actions (or omission thereof) of customers, competent authorities, procurement managers, or procurement commission during the implementation of procurement procedures on behalf of the organizations of TVEL Fuel Company

THE KEY DIRECTIONS FOR THE INTERNAL CONTROL SYSTEM DEVELOPMENT IN TVEL FUEL COMPANY ARE AS FOLLOWS:

- further integration of adequate control procedures in the processes, and allocation of duties and responsibilities to the participants of the processes for the efficiency of internal control;
- development of mechanisms for involving critical stakeholders in internal control activities;
- ICS reliability and efficiency monitoring development by introduction of various methods to promote continuous and regular assessment of the internal control system state;
- SBIC competence and potential development

In accordance with Rosatom Internal Control Development Concept the main purpose of ICS is to promote the achievement of the Fuel Company's strategic goals, to contribute to corporate governance improvement in TVEL JSC and companies forming the management system of the Fuel Company, in compliance with the requirements of the Russian Federation law, regulatory state authorities and international standards.

The purpose of ICS development is to maintain corporate governance mechanisms, primarily the regulatory ones, consistent with changing external and internal conditions.

Apart from the scheduled inspections, the workers of SDIC in TVEL Fuel Company conduct unscheduled inspections by the order of the governance. They also participate in the working groups in the audits of their organizations and in inspections conducted by Rosatom State Corporation.

RESULTS 2018

In accordance with the approved plans of control activities for the next half year of 2018, SBIC employees conducted 92 control activities in TVEL Fuel Company.

The inspections conducted at the enterprises of TVEL Fuel Company revealed violations and deviations in implementation of financial and economic operations.

Based on the revealed facts, corrective measures were developed, and disciplinary measures were applied to employees who committed violations.

92

control activities

Specialized Body on Internal Control performed in 2018

TABLE 6

Number of control activities conducted by the specialists of SBIC and the companies forming TVEL Fuel Company, ea.

INDICATOR	2016	2017	2018	2018/2017, %
Number of control activities in accordance with the plan, including:	**125**	**118**	**92**	**78**
with Audit Committees	2	1	0	0
audit of financial and business activities including procurement and personnel record management	75	71	29	41
internal audit	8	16	30	187

In 2018, SBIC conducted the "Nonconformity Management" audit in TVEL JSC, the results of which confirmed a high culture of output product quality within the Fuel Division.

TABLE 7

Statistics of TVEL JSC Arbitration Committee on complaints, ea.

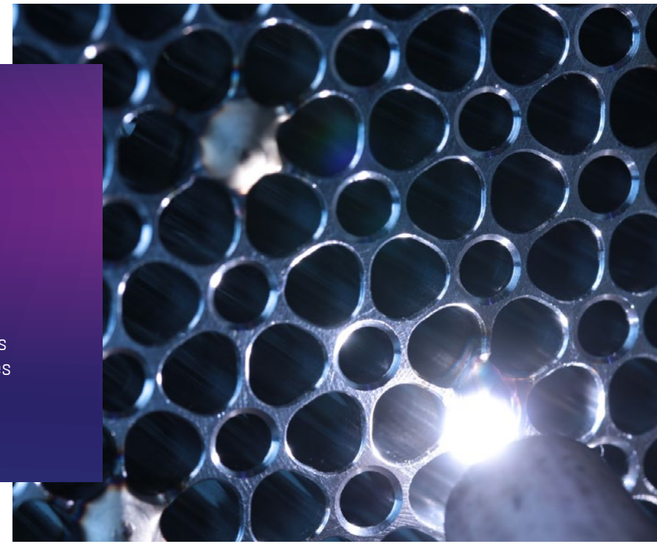
INDICATOR	2016	2017	2018	2018/2017,%
Number of complaints, including:	**118**	**129**	**117**	**91**
justified	15	9	8	89
partially justified	2	7	9	128
not justified	56	63	55	87
withdrawn	13	12	25	200
not considered	32	38	20	53

THE OBJECTIVES OF THE COMPANY IN 2019:

- introduction of a new, more efficient management model with the creation of an expert-methodological center for internal control and audit in TVEL JSC;
- shifting a focus towards internal audit while minimizing the risk of violations;
- increasing the competence in the field of internal audit;
- timely and full identification of material violations in the activity of the companies of TVEL Fuel Company, identification of "weak" places at control facilities and development of recommendations for the integration of preventive control procedures;
- contribution to the achievement of strategic goals of the Fuel Division with regard to increase of the share in the international market, reduction of prime cost, increase of revenue from new products.

MANAGEMENT EFFICIENCY IMPROVEMENT

Performance efficiency of TVEL Fuel Company is determined by the level of rational organization of the governance process and involves finding the best forms, methods and technologies in order to achieve high management and production results



ORGANIZATIONAL STRUCTURE

Changes in organizational structures made by TVEL Fuel Company are stipulated by structures formation based on target programs, objectives and strategy of TVEL Fuel Company. This approach is in line with the industry-wide standards, and was adopted within implementation of the project of Rosatom for harmonization of the organizational structure of the companies comprising the industry. The ultimate goal of these transformations is to establish functional chains of Rosatom — TVEL JSC — subsidiary company, to enhance the efficient interaction between the management levels within TVEL Fuel Company and to cut the red tape.

In 2017, TVEL Fuel Company focused on the implementation of the strategic goal for development of the second core of business-formation of a mechanism for managing the creation of new non-nuclear products and their promotion to the market. Within the framework of this direction, there have been changes in the organizational structure of TVEL Fuel Company with the aim of creating a more effective system for managing the development, production and sale of products of general industrial activity.

TVEL Fuel Company carries out organizational works to develop services on Nuclear and Radiation Hazardous Facilities (NRHF) decommissioning as a new business.

In 2018, SGChE JSC, AECC JSC, CPTI JSC and VNIINM JSC have launched the process of forming competence centers for decommissioning nuclear and radiation hazardous facilities. The main goal of these centers is to perform works on NRHF decommissioning with their own resources both on their sites and in Russia, and abroad.

This area will allow TVEL Fuel Company not only to provide economic benefits, but also to create new jobs.

PRODUCTION SUPPORT OFFICE FUNCTIONS

The Company's enterprises continued to improvethe efficiency of production support office functions.

One of the key projects 2018 "Production planning with the supply chain" had the following results:

- reduced planning process lead time from an application to the formation of production sites plans by 25.3%;
- "right on time production according to volumes and nomenclature" indicator was recorded at 82.7% in MSZ PJSC, NCCP PJSC, Centrotech SPA LLC, ChMP JSC.

CONCENTRATION OF PRODUCTION AND VACANT FACILITIES MANAGEMENT

In 2018, within the framework of the industry project "Branch Topology Concept" the Company successfully implemented the program "Increasing the efficiency of areas use in TVEL Fuel Company". In the reporting period the Company's enterprises developed, within the framework of this program, the concepts of sites development, 9 of which were approved by the Governing Board of TVEL Fuel Company.

According to the results of this program, the Company managed to reduce buildings area for more than 200 thousand sq. m, while reducing the costs for maintenance and operation for more than RUB 300 mln. The Investment Committee of TVEL JSC approved the implementation of the 7 "first wave" compaction projects. 10 compaction projects more are planned in 2019.

The sites development concept of TVEL Fuel Company is constantly updated and refined in terms of cost-cutting and implementation of compaction projects. The term of the program accomplishment is till 2022.

The results of launching the production in vacant facilities by TVEL Fuel Company in 2018:

- UEIP JSC: signing of a lease agreement for a building of 1,400 sq. m. area in the city (not within the industrial site) with Novouralsk Pipe Plant LLC for the production of HDP pipes for water, gas and cable laying. 10 new jobs were created.
- ChMP JSC: use of vacant site of 50 square meters in the existing production building No. 50 for a new business area — production of hafnium iodide powder. 2 additional jobs were created for operation of the site.
- KMZ PJSC: as part of the relocation of special purpose equipment to Tochmash VPA JSC the Company rented 13,131 sq. m of production area and 496 sq. m of office area. 166 new jobs were created.

107,138 **suggestions for improvement(SFI)**

were presented in 2018 in TVEL Fuel Company enterprises, out of which **96.6%** were accepted for implementation, **93.6%** – implemented

TVEL Fuel Company has a system of material incentives for personnel involvement in SFI: in 2018 the total premium amounted to

more than 40 RUB mln

83% of personnel participate in the improvement process through SFI submission. For each employee of the Company has an average of 5.6 SFI. Among the Company's enterprises AECC JSC (over 13 SFIs) and SGChE JSC (over 12 SFIs) have the highest number of SFIs per employee. Most of SFIs are aimed at improving the conditions and ensuring occupational safety.
Economic benefit from SFI and efficiency suggestions implementation made RUB 263.8 mln in 2018.

KMZ PJSC COMPLETED THE COMPACTION PROCESS FOR GAS CENTRIFUGES

TVEL Fuel Company implements a large project on concentration of all mechanical production facilities in Vladimir region at KMZ PJSC with the transition of the corresponding facilities and personnel from Tochmash VPA JSC (Vladimir). Tochmash VPA JSC, in its turn, plans the development of non-nuclear production and attraction of external resident investors to its production site. By optimizing production space and reducing energy consumption, the fixed costs of the two companies are planned to be almost halved by 2019.

Thus, the final stage of the investment project "New facility for gas centrifuges production" was completed in 2018. The project implementation included a set of measures, such as concentrating the production of gas centrifuges in one building, purchasing modern high-performance equipment, launching mass production of gas centrifuges of new generations, increasing the level of automation and the quality of output products.

It resulted in achievement of a key indicator — reducing the cost of production by reducing the work in progress and the lead time of production processes due to the concentration of production in one building (before its start, the production of gas centrifuges was located in four buildings). Moreover, the company managed to reduce its production space more than twice — from 151.1 thousand sq. m to 71.6 thousand sq. m. The reduction of production costs was also due to the R&D results obtained by TVEL Fuel Company in the field of gas centrifuges of new generations.

BUSINESS PROCESS DIGITALIZATION

With the view to increase the efficiency and optimize business processes, TVEL Fuel Company uses up-to-date information technologies (IT) and solutions.

In July 2018, TVEL Fuel Company approved the IT strategy for 2018–2023 in terms of process digitalization. The strategy provides for the implementation of 135 information technology projects in 8 areas of development. Deadlines, budget and internal business customers are determined for each project.

Creation of digital production takes the central place in the strategy. Maximum use of information technologies will allow the enterprises of the Fuel Company to move to a new way of organizing their production activities. Simulation modelling will help to create digital models of existing or projected production, which will give the opportunity to choose the optimal layout and composition of equipment, and to build the ideal production flows.

SCHEME 7

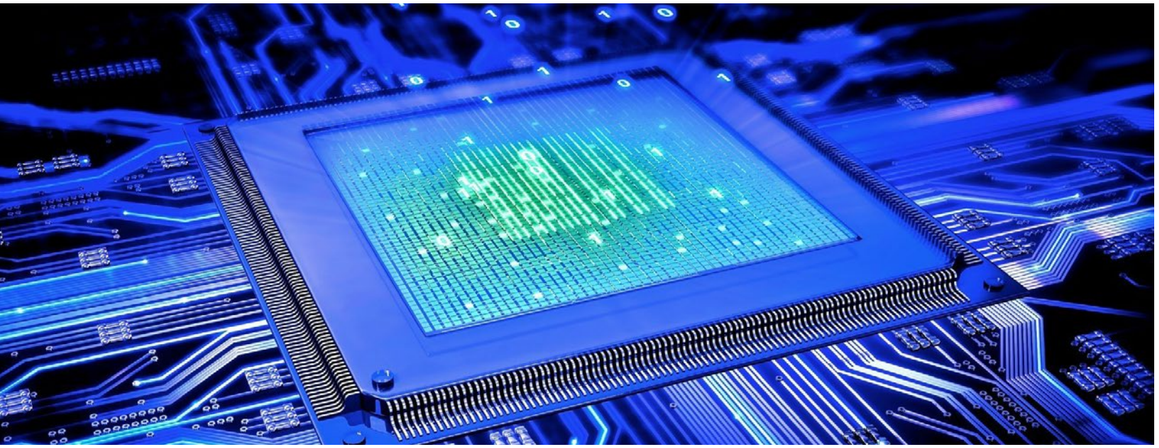
Key areas of projects implementation within the framework of IT strategy

The expected effect from the implementation of the IT strategy by 2030 amounts to

5.1

RUB bln

Another key objective is to integrate the enterprises of the Fuel Company, representing various industrial processes and links in the production chain, into the Unified digital platform for product life cycle management, and to create a digital interaction ecosystem for developers and partners. The engineering data management system will allow to switch to the work with a product's "digital twin" (software analogue of a physical device, simulating internal processes, technical characteristics and behavior of a real object under external influence conditions) throughout the product life cycle, and to use uniform product data by all participants from developers to operation support experts.



The important objectives also include the implementation of operational production management systems and the automation of maintenance and repair of production equipment, which will ensure a steady increase in labor productivity and a reduction in costs per production unit.

IT infrastructure development projects of TVEL Fuel Company are intended, specifically, to create a hyper-convergent environment in data processing centers, supporting the implementation of Big Data technologies, and to build up an infrastructure of virtual workplaces.

In October 2018, the Company approved the strategy of information technologies development subject to products areas. The implementation of this strategy will allow to commercialize the Company's developments in the field of information technologies and create an additional synergistic effect with the internal digitalization strategy of TVEL Fuel Company. The following is offered to foreign markets:

- simulation modelling services and BIM design of industrial facilities;
- predictive analytics solutions for big data processing;
- solutions for robotization and intelligent data processing;
- production of network equipment.

RISK MANAGEMENT

Effective risk management is one of the most important prerequisites for business sustainability of TVEL Fuel Company. The current risk management system is aimed at timely identification of risks, as well as the implementation of measures to manage them

Current trends in risk management assume a transition from formal description of risks to the integration of risk management mechanisms into business processes, mainly related to the adoption of strategic management decisions.

By order No. 4/253-n of June 28, 2018 the introduction of the Unified Industry Order for organizing the work of the early risk response system of the Russian Federation state program "Development of the Nuclear Energy Industrial Complex" was approved.

Risk Management of TVEL Fuel Company is based on continuous monitoring of its external and internal environment, complex analysis of threats and opportunities affecting achievement of both economic and social goals of the Company.

Main goal of the Risk Management System (RMS) is identification, assessment and minimization of threats that may affect the results of activities of the Company.

Main RMS objectives are the following:

- timely identification of risks that may affect the achievement of the goals of TVEL Fuel Company;
- support of stable financial environment of the companies of TVEL Fuel Company with due consideration of the risks;
- continuous monitoring of risks and control over implementation of the plans of arrangements aimed at reduction of likelihood of risks occurrence and minimization of the consequences of such occurrences.

The Risk Management System of TVEL Fuel Company is built and optimized in accordance with the most modern world practices, principles and approaches reflected in the international standard ISO 31000:2018 (over the past few years has been developed by the International Organization for Standardization), as well as in the concept of COSO Enterprise Risk Management (it has applied significance in building the relationship between risk management and the value of the business).

Analysis of the risks affecting the achievement of target values of financial and economic activities of TVEL JSC and

SCHEME 8

Participants of TVEL FC risk management processes and their roles

President of TVEL JSC	– approval of the risk management policy of the Company; – approval of the list of key risks; – appointment of key risks holders and distribution of responsibility for risks management; – approval of the limits of particular risks, strategies, programs of particular risks management; – consideration of the issues related to distribution of authorities and responsibilities for particular risks management.
Risk holders (Responsible for risks management)	– identification and assessment of risks – development of key risk indicators – development and implementation of programs for particular risks management
Risk Officer of TVEL JSC	– organisation and methodological support of risks identification – organization and methodological support of the process of development of risk management activity

the companies forming TVEL Fuel Company management system shall be carried out at the stage of development of the budget and medium-term plans, and at the stage of their control and performance forecast, as well as at the stage of making strategic management decisions, selecting the best ways to implement the key projects.

In 2018, work continued on the development of risk management in TVEL Fuel Company:

- **in project management** – an electronic designator of project risks was approved (Order No. 4/420-П dated 09.28.2018);
- **in the quality management system** – the standards "Integrated Management System. Risk management in the corporate management system" (Order No. 4/225-П dated 04.06.2018) and "Integrated Management System. Hazard Identification. Risks. Evaluation and Management" (Order No. 4/144-П dated 04/04/2018)

IN 2018, THE COMPANY MANAGED TO SYSTEMATIZE THE APPROACH TO INSURANCE AGAINST CERTAIN RISKS:

1. The Order No. 4/493-п dated 12.12.2017 provides for such risk management method as transfer (insurance) to certain key risks of TVEL JSC and its subsidiaries;
2. The Order No. 4/467-п dated 23.10.2018 provides for the property insurance program of TVEL JSC for 2018–2019;
3. The Order No. 4/190-п dated 10.05.2018 determines the size of risks self-retention and the procedure for determining the optimal level of deductibles when insuring risks of TVEL JSC and its subsidiaries.

PLANS ON FURTHER DEVELOPMENT OF THE RISK MANAGEMENT SYSTEM FOR 2019 include the development of a risk management system in terms of strategic risks, as well as the promotion of a risk-based approach in investment projects management.

TABLE 8

Management of TVEL Fuel Company key risks

№	RISK	RISK FACTORS	RISK MANAGEMENT MECHANISMS	Trends in likelihood of risk occurrence in the reporting year	Trends in risk significance in the reporting year
1	**Risk of NFC product/service sale volumes reduction**	– Delays in commissioning of power units; – Transition to NF fabrication with increased long-term performance	– Improvement of fuel technical characteristics and introduction of new types of fuel, improvement of fuel economic characteristics; – Promotion of products in new market segments	○	○
2	**Price and currency risks**	– Reduction of prices for the products and services of TVEL Fuel Company due to changes of market prices for natural uranium and its conversion and enrichment services; – Reduction of prices for the products and services of TVEL Fuel Company due to changes of prices deflator indices; – Mismatch in assets and liabilities denominated in the same currency; – Growth of volatility courses of the main world currencies (Euro, dollar)	– Use of hedging techniques in contracts of TVEL Fuel Company; – Natural hedging of currency risks	○	↑
3	**Risk of failure on the part of counterparties (suppliers, customers) to fulfil obligations in full and on time**	– Decreased financial and economic stability of customers/suppliers	– Provision by the contracts of payment methods and/or methods to secure obligations to reduce the credit risk level; – Monitoring of financial standing of the counterparties with the purpose to detect any signs of changes in financial standing, leading to changes in the level of the credit risk and/or the measures of the credit risk management; – Qualification of counterparts using non-financial indicators	○	○
4	**Risk of increase of costs of fabrication, enrichment and conversion services**	– Changes in service tariffs of natural monopolies, sole suppliers; – Reduced equipment loading level; – Appearance of unforeseen weak points in production chain; – Incorrect information on resource state	– Application of the principles of the Uniform Industrial Procurement Standard of Rosatom while working with suppliers; – Implementation of Rosatom Production System; – Implementation of the long-term programs and investment projects aimed at optimization of engineering and production processes; – Development and introduction of the programs of efficiency increase at all enterprises of the Company; – Adoption of production cost management concept in order to personalize the cost; – Long-term forecasts of the demands and production capacity balance (together with Rosatom and relative divisions of Rosatom State Corporation); – Stock optimization and turnover increase	○	↓
5	**Risk of nuclear, radiation safety**	– Violation of requirements related to environment protection and nuclear radiation safety; – Insufficient level of emergency preparedness; – Lack of resources for decommissioning of nuclear and radiation hazardous facilities, securing nuclear and radiation security, etc	– Modernization and automation of facilities, safe operation management; – Decommissioning of nuclear and radiation hazardous facilities of TVEL Fuel Company, as well as the "nuclear heritage" objects using the funds of FTP NRS-2 and the sectoral reserves; – Professional development of personnel; – Continuous monitoring of nuclear and radiation safety state; – Setting and implementation of tasks, objectives, elaboration of measures aimed at reduction of risks in the field of NRS; – Complex and technical inspections	○	○
6	**Risk of environmental safety**	– Inability to comply with the requirements to environment protection; – Insufficient level of emergency preparedness; – Lack of resources for implementation of environmental safety actions	– Setting of tasks and objectives, and elaboration of measures aimed at reduction of risks in the field of environment protection, operational health and labor safety; – Review of draft regulations containing requirements to environment protection. Interpretations of the practical application of the requirements; – Implementation of actions aimed at safety improvement using special reserve funds of Rosatom State Corporation; – Emergency response drills and personnel training, provision of information with the purpose of unscheduled inspections; – Comprehensive and technical inspections, audits, ecological monitoring; – Improvement of the integrated system of environmental safety management (ISO 14001:2004), and occupational health and industrial safety management (OHSAS 18001:2007)	○	○
7	**Risk of personnel health and safety**	– Violations of safety requirements; – Hazardous and harmful production factors; – Violation of the corporate code of conduct. Failure to comply with work and rest schedule; – Lack of resources for safety actions implementation	– Improvement of safety culture; – Implementation of actions to prevent injuries; – Promotion of safe labor; – Provision of the Company's staff with personal protective equipment; – Complex and technical inspections, audits; – Setting of tasks and objectives, and elaboration of measures aimed at reduction of risks in the field of industrial safety; – Planning of costs for labor protection in accordance with the Industrial Agreement; – Improvement of the integrated professional (labor safety), industrial and environmental safety management system (ISO 14001: 2004; OHSAS 18001:2007)	○	○

№	RISK	RISK FACTORS	RISK MANAGEMENT MECHANISMS	Trends in likelihood of risk occurrence in the reporting year	Trends in risk significance in the reporting year
8	**Risk of industrial safety violation**	– Insufficient level of emergency preparedness; – Lack of resources for safety actions implementation	– Emergency response drills; – Complex and technical inspections; – Performance review of outside emergency response teams; – Setting of tasks and objectives, and elaboration of measures aimed at reduction of risks in the field of industrial safety; – Reservation of funds and resources, public liability insurance; – Improvement of the integrated professional (labor safety), industrial and environmental safety management system (ISO 14001: 2004; OHSAS 18001:2007)	○	○
9	**Social and political risks**	– Events (political conflicts and/or mass social protests) resulting in substantial change in the parameters of actions of TVEL Fuel Company and its enterprises, for instance, missed deadlines of commissioning or cancellation of construction, unscheduled termination of operating activity, damage to goodwill of TVEL Fuel Company and its governance	– Implementation of actions aimed to mitigate the risks of social and political tension in the regions of presence; – Cooperation with regional and municipal public authorities on issues relating to the territories' development, regional taxes gain and maintenance of social and economic stability; – Implementation of charitable social efforts in the cities of TVEL Fuel Company's presence; – Formation of the system of multi-level internal (including on a cascade basis) and external communications; – Holding of social forum-dialogues in the regions of presence of the enterprises of TVEL Fuel Company	○	↓
10	**Reputation risk**	– Large-scale accidents in nuclear sector; – Distribution of negative information about Rosatom State Corporation, its enterprises; – Mass protests against nuclear power engineering; – Election campaigns in regions and cities of presence; – Construction of burial sites for radioactive wastes in the regions of presence of TVEL JSC subsidiaries	– Observance of the industrial regulation concerning organization of delivery of information to the public in case of emergencies constituting a threat to business and social reputation of Rosatom State Corporation; – Implementation of the project "Publicity Capital Management" aimed at creating a positive social attitude to the development of nuclear technologies, increasing the information favoured index of TVEL JSC activity; – Implementation of the Uniform information policy of TVEL Fuel Company of Rosatom; – Integrated communications; – Implementation of target communication programs to promote products and services of TVEL JSC and its subsidiary companies; – Formation of corporate culture values and implementation of the project "Public response to Rosatom values"; – Enhanced activity of the information conciliatory committees in municipal districts of presence	○	↓

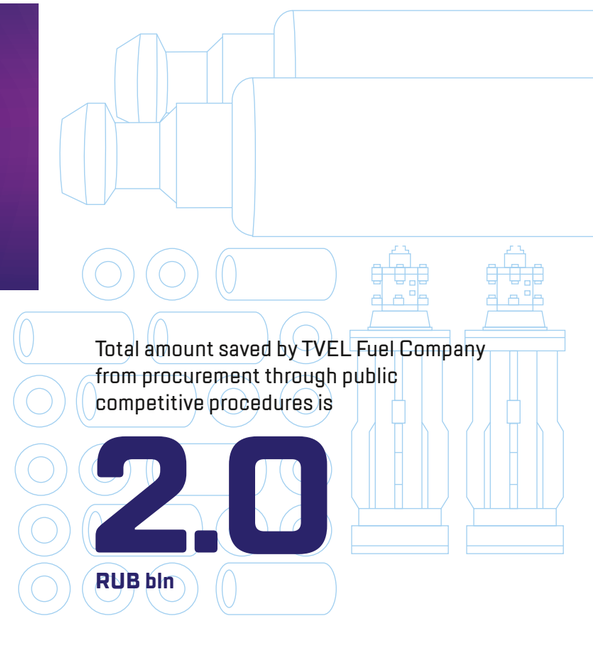
○ Without change

↑ Growth

↓ Decrease

PROCUREMENT MANAGEMENT

TVEL Fuel Company seeks to organize a professional, responsible and transparent procurement management system to support its activities



Procurement implementation using the electronic platforms promotes openness and transparency, and saves labor and financial resources. TVEL Fuel Company performs procurement procedures using the electronic platforms of United Electronic Market Place JSC, Fabrikant LLC and Economics Development Center JSC.

In 2018, total amount of procurement was 8.1% higher compared to previous year and amounted to RUB 102.9 bln, while savings resulting from procurement procedures on an open competitive basis made RUB 2.0 billion.

Total amount saved by TVEL Fuel Company from procurement through public competitive procedures is

2.0

RUB bln

TABLE 9

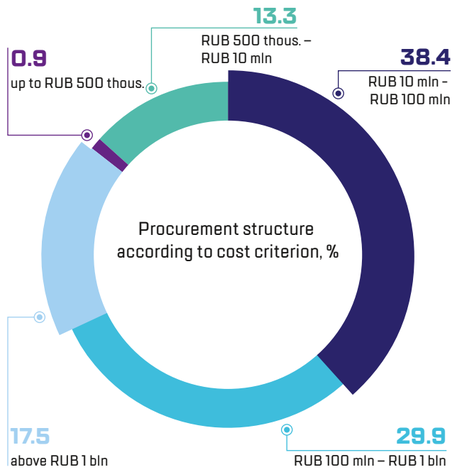
Key indicators of procurement activities of TVEL Fuel Company

INDICATOR	2016	2017	2018	2019 (PLAN)
Share of procurement through public competitive procedures under the UIPS, %	97	97	94	Not less than 93
Total amount of procurement of TVEL FC, RUB mln	100,988	95,261	102, 850	103,662
Total amount saved by subsidiaries of TVEL FC from procurement through public competitive procedures on an open competitive basis, RUB mln	2,850	2,719	2,016	Not less than 2,000

The largest procurement groups are the products and services purchased from the companies of nuclear industry, power supply. These are the largest categories in procurement from sole supplier.

Some of the key suppliers and contractors of the Company enjoy monopolist position on the market. Under the provisions of UIPS (Uniform Industrial Procurement Standard of Rosatom State Corporation) no tender is provided for such contractors (natural monopoly entities), only according to the "Procurement from Sole Supplier" procedure.

DIAGRAM 3



Key documents that regulate procurement and set TVEL Fuel Company supplier and contractors selection criteria:

- Federal Law No. 223-FZ "On Procurement of Goods and Services by Particular Types of Legal Entities";
- Rosatom Uniform Industrial Procurement Standard;
- TVEL JSC Corporate Standard "Procurement Process"

In 2017, the Arbitration Committee of TVEL JSC received 117 complaints related to procurement activities of the Fuel Division. 17 complaints were admitted as reasonable (partially reasonable). For details, see the Internal Control System section

Basic groups of competitive procedures:

- materials and equipment;
- construction and installation works;
- manufacture of components;
- repair and maintenance of equipment.

Pursuant to the provisions of the Uniform Industrial Procurement Standard of Rosatom the Company may not provide any preferences to the suppliers on a territorial basis. Local suppliers participate in competitive procedures on a common basis.

In planning and implementation of procurement activity the enterprises of TVEL Fuel Company afforded priority rights to small and midsized businesses in accordance with the Federal Law No.223-FZ "On Procurement of Goods and Services by Particular Types of Legal Entities", and in accordance with the Resolution of the Government of the Russian Federation d/d December 11, 2014 No.1352 "Concerning special aspects of participation of small and midsized business in procurement of products, works, services by particular legal entities". The share of procurement from small and midsized business related to certain enterprises of TVEL Fuel Company makes from 46.8% to 98.1%, when the regulatory level is 18.0%.

The share of procurement from small and midsized business related to certain enterprises of TVEL Fuel Company makes

from 46.8% up to 98.1%

when the regulatory level is 18.0%

Suppliers and contractors are evaluated using the criteria of labor practices, impact on society and environment subject to availability of all permits and licenses set by the law. Such criteria also include availability of management system certificates as evaluative ones i.e. forming the final evaluation for a member of procurement procedure. The Company does not perform any evaluation study of actual and potential impacts in the supply chain; all concluded contracts are checked for compliance with the Russian legislation.

In 2018, the Fuel Company continued the implementation of the program "Transformation of the equipment and material procurement process". A number of activities have been implemented to significantly reduce labor costs and improve the quality of data in the accounting system of TVEL Fuel Company (SAP ERP): automated planning for non-nuclear goods and materials, unified process of design specification creation, implemented system of equipment and material procurement control. Quantitative results:

- within the framework of increasing the inventory turnover of non-uranium materials and resources, the reduction of unclaimed goods and resources was more than RUB 230 mln. (reduced warehousing costs for non-uranium goods and resources);
- the principle of "just in time" delivery was accomplished on materials and resources for RUB 1.47 bln;
- the principle of consignment storage was accomplished on goods and materials for more than RUB 400 mln;
- decrease in the cost of purchased goods and resources (except for uranium-containing) for more than RUB 430 mln. (target value – RUB 400 mln per year);
- as part of measures aimed at improving the deliveries quality of critical items through qualified suppliers, 109 audits were conducted to check the reliability of data obtained from manufacturers, service companies and contracting enterprises.

Apart from that, in the reporting period the Company implemented a project on organization of a service department for functional customers of TVEL Fuel Company's enterprises. The objectives of this project were to remove from customers non-core works on procurement, create a "single window system" on the whole process, conduct competitive procurement procedures from RUB 0 to 100 mln on the basis of the Fuel Company's authorized body (Industrial Innovations JSC), reduce process lead time due to robotization of user activity and introduction of artificial intelligence (automatic calculation of nominal (maximum) contract price, checking design specifications, etc.).

ROBOTIZATION OF PROCUREMENT PROCEDURES

In 2018, Industrial Innovations JSC (specialized in procurement procedures and information technology, subsidiary of TVEL JSC) implemented a pilot project on robotization of user's routine operations in SAP ERP information system of TVEL Fuel Company.

The software robot released the commercial service employees from primary documents paperwork for procurement procedure (in particular, the remuneration report of the authorized procurement authority). Working in the background, the robot analyses the appearance of agreed final protocols of procurement procedures at specified intervals, forms the calculation of remuneration, the corresponding card in electronic document flow SAP ERP and sends it to the responsible officer for acceptance.

As a result, the time spent on generating reports was reduced by 50%, human mistake factor disappeared: responsible employees only need to coordinate the automatically generated documents.

PLANS FOR 2019:

- decrease of the unclaimed goods and materials share in the structure of stocks;
- qualification of all suppliers of responsible items;
- replication of "just in time" delivery principles;
- replication of purchases on consignment storage conditions;
- organization of the process of automated planning the needs in materials and equipment;
- reducing warehousing costs at least 10% due to the introduction of advanced practices, development of a system for visualizing the parameters of warehouse operations;
- reduction of labor costs by at least 10% due to the robotization of individual user operations in the equipment and material procurement process.

ANTI-CORRUPTION

The management and the workers of TVEL Fuel Company fully share the anti-corruption policy implemented by the Government and Rosatom State Corporation

Concentration in TVEL Fuel Company of significant material, financial and intellectual resources determines the critical importance of ensuring their security (including counteracting the misuse of assets, their theft, corruption and other economic abuses).

In order to create conditions for reduction of corruption and embezzlement, the enterprises of the Company adopted a local regulatory document "Concerning implementation of the Complex program for anti-corruption and anti-embezzlement in TVEL JSC and companies of the management system of the Fuel Company". The document is based on the approved by Rosatom "Anti-Corruption Plan 2018–2020 of the State Atomic Energy Corporation "Rosatom".

In 2018, TVEL JSC enacted the following anti-corruption orders:

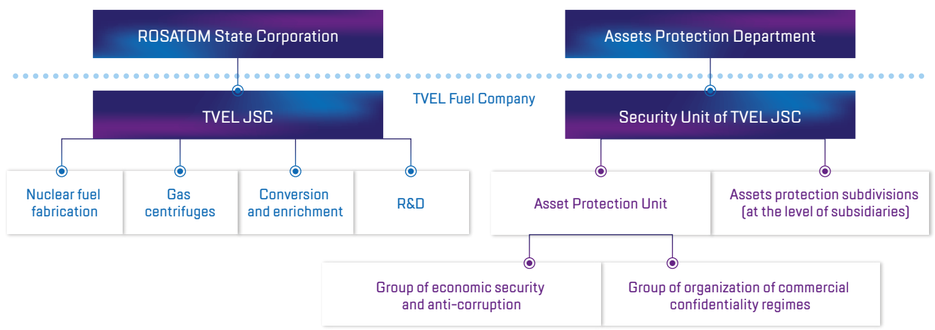
- Order d/d 23.10.2018 No. 4/469-П "On approval and implementation of the Anti-Corruption Plan in TVEL JSC for 2018–2020".

The Unified Sectoral Guidelines for the Assessment of Corruption Risks in the companies of Rosatom are aimed at:

- establishment in the companies of Rosatom of general approaches to identify processes and business operations in the activities of an organization, the implementation of which is associated with likelihood of corrupt practices committed by employees of such organization, both for personal gain and for the benefit of the organization;
- ensuring compliance of anti-corruption measures implemented with the specifics of the organization's activities and the tasks of rational use of resources focusing at carrying out work to prevent corruption; formation of the list of posts associated with high corruption risk; development of a set of measures to eliminate or minimize corruption risks;
- ensuring minimization of possible corruption manifestations and risks in the implementation of large-scale projects with the government participation, including infrastructure projects financed within the framework of federal target programs and at the expense of the National Welfare Fund.

SCHEME 9

System for combating unlawful behavior in TVEL FC



Normative legal acts and local documents of TVEL JSC in the field of anti-corruption are posted on the Company's official website tvel.ru/about/theft

As part of the systematic work aimed at countering corruption and other violations, the Fuel Company established the following divisions:

- the Asset Protection Unit (at the level of TVEL JSC);
- assets protection subdivisions (at the level of subsidiaries).

The main objectives of the security unit of TVEL JSC are to create conditions for the effective development of the Company by successfully countering the negative influences of external and internal factors that threaten the implementation of its strategic initiatives and the fulfilment of the production plans of the nuclear industry.

As of December 31, 2018, in the asset protection subdivisions, there were 61 qualified specialists with the necessary knowledge and experience.

Main fields of structural subdivisions' work:

- ensuring economic security and protection of assets of TVEL JSC and its subsidiaries in the course of production and financial economic activity;
- revealing, prevention and localization of threats (risks) to economic interests and business reputation of TVEL JSC and its subsidiaries;
- information and analytical support of the President of the Company and structural subdivisions of the Company regarding the economic security;
- arrangement in the Company and its subsidiaries of the regime of commercial and business secrecy;
- development and implementation of measures aimed at prevention of corrupt behavior.

As part of the execution of the order on corruption risks, 31 business processes were evaluated.

Contacts of the corporate hot line of Rosatom for anti-corruption and anti-embezzlement in nuclear sector:
Tel.: 8 (800) 100-07-07,
E-mail: 0707@Rosatom.ru

For details visit Rosatom website:
Rosatom.ru/about/protivodeystvie-korruptsii

And TVEL Fuel Company website:
tvel.ru/about/theft

TABLE 10

Results of TVEL Fuel Company anti–corruption activity

INDICATOR	2016	2017	2018	2018/2017,%
Number of package materials sent to law enforcement agencies	34	37	37	100
criminal proceedings instituted on their basis	22	17	24	141
Employees brought to disciplinary responsibility	25	29	38	131
Number of verifications of information on possible abuse and violations received through the specialized communication channels "Hot Line"	98	102	135	132
the number of verifications for which the information was confirmed	31	32	32	100
Amount of prevented and compensated damage as a result of the implementation of measures to ensure economic security and asset protection, RUB mln	1,094	1,347	1,172	87

PERFORMANCE RESULTS

FINANCIAL CAPITAL

TVEL Fuel Company maintains historically sustainable financial performance. Competent financial management combines efficient application of all financial instruments for implementation of strategic goals of the Fuel Division, and makes it possible to handle the current problems and to invest the funds providing thereby increase of other capitals used by the Company

INVESTMENT MANAGEMENT

Investment management system of TVEL Fuel Company is based on the principle of efficiency. TVEL Fuel Company carries out its investment activities in line with the Uniform Industry-Specific Policy of Rosatom State Corporation and its organizations. The Investment Committee of TVEL JSC is a permanent collegiate advisory board (further on – the Committee).

The activity of the Committee is aimed at formulation of the concerted position in regard to:

- investment priorities in order to implement the Business Strategy of Rosatom State Corporation and TVEL Fuel Company;
- structure, parameters of the Portfolio components of TVEL Fuel Company, and amendments thereto, and control over sales of its components at all stages of their life cycle;
- preventive and corrective actions.

RESULTS 2018

In 2018, the Investment Committee of TVEL JSC held 28 meetings. Amount of financing of the Portfolio components of TVEL Fuel Company made RUB 31,908 mln (in 2017 – RUB 26,514 mln). Financing of investment projects on the following directions:

- nuclear industry;
- development of general industrial activities;
- development of infrastructure;
- safety and encumbrances, etc.

Amount of the Portfolio financing tends to yearly fluctuations, as it depends on combination of different stages of life cycle of the components available (more than 200) at the same time.

Funding of industrial and technological base accounts for the biggest share in overall investment outlay.

Efficiency of investment activity in TVEL Fuel Company is estimated using the Investment activity integrating efficiency indicator. This indicator consists of several elements that describe efficiency by directions:

- short-term investment activity efficiency;
- long-term Portfolio efficiency;
- quality of major projects implementation that enables estimation of key events performance indicator for the current period.

According to the results 2018, the Investment Activity Integrating Efficiency Indicator of TVEL Fuel Company is 98.10%.

FINANCIAL RESULTS

Changes in total revenue 2018 by 10% as compared to the previous reporting period are stipulated both by one-time events, such as shipment in 2017 of initial loading fuel for new power unit of Rostov NPP, and by changes in the orders volume under the contract conditions, and influence of prices and exchange rates.

The main part of revenue of TVEL Fuel Company comes from sales of nuclear fuel and its components (65.1%), and rendering of conversions and enrichment services (16.9%), and sales of other products (15.4%); R&D accounts for 2.6%.

Downward trend for net profit of the Company (–11% as compared to 2017) is connected with changes in total revenue and increase in revenue through exchange differences.

Decrease in net profit had an impact on slight decline of profitability indices.

TABLE 11

Structure of the Investment Committee of TVEL JSC in 2018

MEMBER OF THE COMMITTEE	Name, title
Chairman	N.V. Nikipelova – President of TVEL JSC
Deputy Chairman	M.G. Zarubin – Senior Vice-President for Production of TVEL JSC
Secretary	P.A. Pozdniakov – Director of Investment Department of TVEL JSC
Members	Yu.A. Kudriavtsev – Senior Vice-President for New Business Development of TVEL JSC
	K.Yu. Vergazov – Senior Vice-President for Science, Engineering, Technology and Quality of TVEL JSC
	K.K. Sokolov – Vice-President – Business and Fuel Power Resources Manager of TVEL JSC
	S.I. Boridko – Vice-President for Safety of TVEL JSC
	I.B. Galkin – Vice-President for Strategic Development and Marketing of TVEL JSC
	K.V. Tulupov – Vice-President for Business Development of TVEL JSC
	E.V. Lyakhova – Director for Economy and Investments of Rosatom State Corporation
	V.I. Korogodin – Director for Lifecycle Management of Nuclear Fuel Cycle and NPP of Rosatom State Corporation
	A.S. Voronin – the expert of the Division of investment project portfolio management of the Department of Investment Management of Rosatom State Corporation

DIAGRAM 4

Revenue (net) from sales, RUB mln

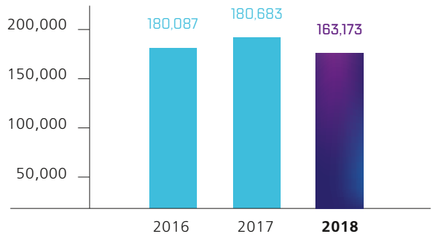


DIAGRAM 5

Gross profit, RUB mln

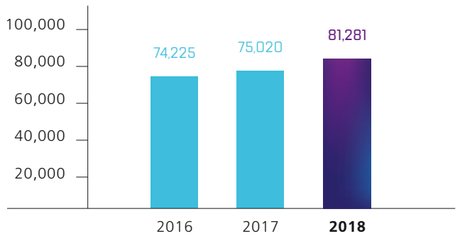


DIAGRAM 6

Net income, RUB mln

DIAGRAM 7

EBITDA, RUB mln

DIAGRAM 8

Net assets, RUB mln

DIAGRAM 9

Key profitability indices, %

In 2018, the export products were sold to the total amount of USD 961 mln. Sales of nuclear fuel and its components amount to 93.7% – the largest share in the export revenue.

In 2018, share of revenue received from FA sales made RUB 100,532 mln – 62% in total consolidated revenue. Main consumers are Russian and European NPPs.

Following the results 2018, volume of sales from general industrial activities increased by 22.8%, to RUB 13,494 mln.

DIAGRAM 10

Distribution of revenue from nuclear fuel sales by consumers' geography,%

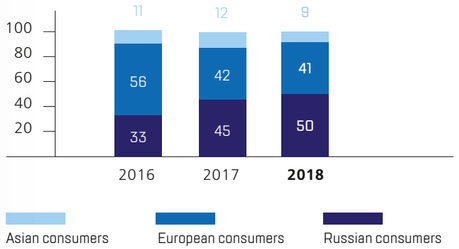


DIAGRAM 11

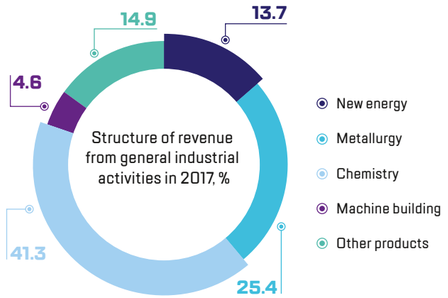


TABLE 12

Generated, Distributed and Direct Economic Value, RUB mln

DIRECTION	2016	2017	2018
Direct generated economic value	**198,858**	**197,460**	**181,604**
Distributed economic value, including:	**169,627**	**144,033**	**153,452**
Operational expenses	103,678	86,817	76,616
Salary and other benefits to employees	26,843	27,432	29,027
including extrabudgetary insurance premiums	5,632	5,757	6,027
Payment to capital providers	30,019	19,253	37,757
Investment into associations and charities	1,719	1,876	1,794
Gross tax payments*	7,367	8,656	8,257
Undistributed economic value	**29,232**	**53,427**	**28,152**

* Changes of data as compared to TVEL JSC annual report 2016–2017 are due to changes in calculation methods. In prior years the payment to a designated member – AEP JSC was taken into account to calculate corporate profit tax of the organizations within the consolidated taxpayer group. In 2018, consideration was given to actual share of profit tax paid to the budget by a designated member. New approach is considered more reliable to reflect information on paid taxes since it reflects actual profit tax amounts paid to the budgets of different levels rather than settlements between the members of the consolidated taxpayer group.

Table of Contents

Financial soundness and liquidity indicators of the Company are at high level. In 2018, the current liquidity ratio improved considerably.

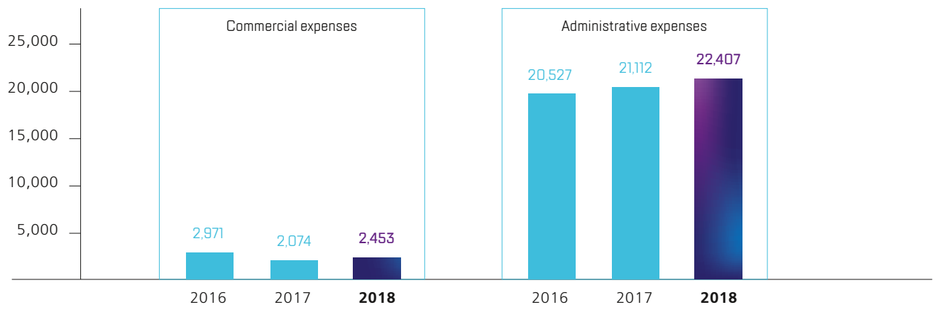
TABLE 13

Financial soundness and liquidity indicators

INDICATOR	2016	2017	2018	2018/2017,%
Ratio of borrowed and own funds	0.10	0.07	0.06	–15
Current liquidity ratio	4.02	6.02	6.86	14
Return on basic production capacity	1.15	1.13	0.97	–14
Receivables turnover period, days	79	96	99	4
Stock turnover period, days	168	140	141	0

DIAGRAM 12

Commercial and administrative expenses, RUB mln*



* Information on administrative expenses differ form information in TVEL JSC Annual Report 2017 due to reversal of re-classification of administrative expenses into the cost of sold products, works, services in the approach to formation of management reporting of Rosatom State Corporation.

Dividend policy of TVEL JSC with regard to subsidiary companies is set with account of need for investment in production, its reconstruction and improvement of technical facilities.

TABLE 14

Basic financial indicators of TVEL Fuel Company in 2018, RUB mln

INDICATOR		REVENUE (NET) FROM SALES	NET PROFIT
Separation-sublimation complex (SSC)	AECC JSC	6,354	2,843
	PA ECP JSC	14,820	4,508
	SGChE JSC	13,838	3,718
	UEIP JSC	22,306	5,390
Total for SSC		**57,318**	**16,459**
Nuclear Fuel Fabrication Complex (NFFC)	MSZ PJSC	17,909	2,220
	NCCP PJSC	8,004	1,496
	ChMP JSC	13,924	2,904
	MZP JSC	180	–214
Total for NFFC		**40,017**	**6,406**
Gas Centrifuge Complex (GCC)	KMZ PJSC	1,543	140
	Centrotech SPA	2,664	–532
Total for GCC		**4,207**	**–392**
Research Complex	VNIINM JSC	4,936	317
	Tochmash VPA JSC	3,565	–296
TOTAL for Research Complex		**8,501**	**21**
Ecoalliance LLC		4,239	214
Industrial innovations JSC		423	123
Iskra LLC		478	–91
TVEL JSC		129,374	32,114

TABLE 15

Dividend payout, RUB mln

INDICATOR	2016	2017	2018	2018/2017,%
Dividends paid to Atomenergoprom JSC, RUB mln	28,233.9	20,428.8	35,069.1	72
Dividends paid to TVEL JSC from subsidiaries	2,816.6	2,298.0	7,175.2	212

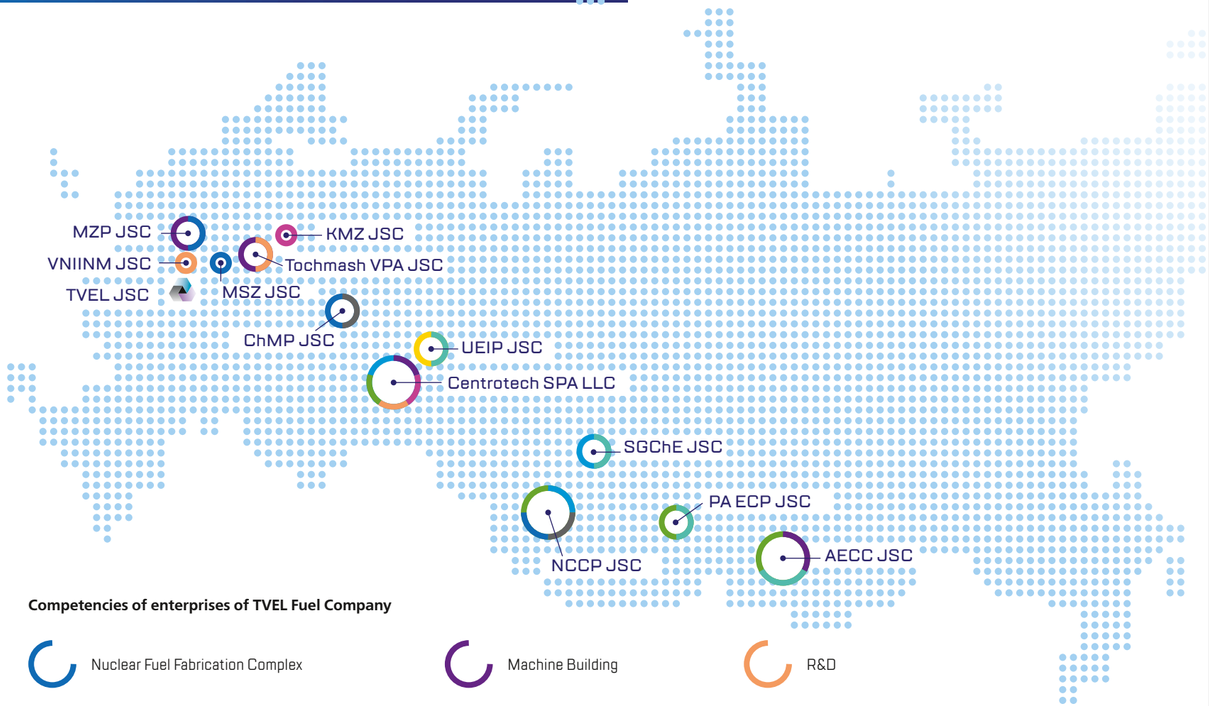
MANUFACTURED CAPITAL

TVEL Fuel Company consolidates the manufactured assets along the whole process chain of nuclear fuel production, and also controls strong scientific complex. Continuous development and accumulated competences in the nuclear industry ensure both improvement of fuel properties and creation of new high-technology businesses

CONVENTIONAL BUSINESSES

TVEL Fuel Company comprises three complexes for type-specific production of the front end nuclear fuel cycle, and scientific and design assets.

The plans on production and sales of nuclear products and services in the reporting year have been fulfilled to the full extent, which ensures compliance with all contractual commitments of the Company to Russian and foreign customers and contributes to improvement of the Company image of the reliable and responsible supplier.



Competencies of enterprises of TVEL Fuel Company

- Nuclear Fuel Fabrication Complex
- Machine Building
- R&D
- Gas Centrifuge Complex
- Metallurgy
- Chemistry
- Separation- Sublimation Complex
- New Energy
- Additive Technologies

SEPARATION–SUBLIMATION COMPLEX (SSC) COMPRISES A GROUP OF INTEGRATED PLANTS ENGAGED IN ENRICHMENT AND CONVERSION OF URANIUM

In 2018 the plan of SSC enterprises for production of enriched uranium products and achievement of the set capacity utilization factor was accomplished to the full extent.

2018 MILESTONES

- 5 sections of gas centrifuges of the 9th generation 9+ were commissioned at UEIP JSC.

2019 PLANS

- commissioning of 5 sections of the unit No. 62 at UEIP JSC;
- commissioning of the unit No.1 and 4 sections of the unit No.2 at PA ECP JSC.

TABLE 16

Labor efficiency dynamics of the separation and sublimation complex, RUB mln/pers.

SUBSIDIARY COMPANIES	2016	2017	2018	2018/ 2017, %
SGChE JSC	4.73	5.17	5.01	–3
AECC JSC	5.90	7.04	7.61	8
PA ECP JSC	6.78	7.41	7.73	4
UEIP JSC	10.49	11.18	10.40	–7

NUCLEAR FUEL FABRICATION COMPLEX (NFFC) IS A GROUP OF SUBSIDIARY INDUSTRIAL ENTERPRISES THAT MANUFACTURE NUCLEAR FUEL FOR VARIOUS REACTORS

In 2018, the plan of NFFC enterprises for production of nuclear fuel was implemented in full.

The planned volume of the manufactured fuel products for the year 2019 is determined in accordance with preliminary orders made by consumers based on the plans of primary charging and recharging.

2018 MILESTONES

- production of initial loading fuel for VVER-1200 reactor of the unit No.1 of Belarusian NPP by NCCP PJSC;
- production of startup zone TVS-1200 for power unit 2 of Novovoronezh NPP-2 by NCCP PJSC;
- qualification of zirconium components production by the American customer at ChMP JSC;

TABLE 17

Labor efficiency dynamics of the fabrication complex, RUB mln/person

SUBSIDIARY COMPANIES	2016	2017	2018	2018/ 2017, %
Machine-Building Plant (MSZ PJSC)	5.46	5.33	4.38	–18
Novosibirsk Chemical Concentrates Plant (NCCP PJSC)	4.92	6.04	6.04	0
Chepetsky Mechanical Plant (ChMP JSC)	4.58	4.38	4.56	4
Moscow Polymetal Plant (MZP JSC)	0.97	4.48	1.20	–73

- production and delivery by MSZ PJSC to the Czech customer of new type fuel TVSA-T mod.2 for Temelin NPP;
- delivery of 12 TVS-2M with new anti-debris filter (ADF-2) for Rostov NPP;
- completion of new site construction for uranium dioxide powder production using recovery pyrohydrolysis at VPGU-600 plant at MSZ PJSC.

2019 PLANS

- production and delivery to the customer of initial loading fuel for the Unit 2 of Belarusian NPP;
- delivery of TVS-MOX for BN-800 reactor.

MSZ PJSC WILL START PRODUCTION OF NUCLEAR FUEL FOR NUCLEAR-POWERED ICEBREAKERS

The enterprise will manufacture nuclear fuel for ship power plant of the icebreakers "Iamal" and "Sibir", and will start manufacture of fuel assemblies for general-purpose nuclear-powered icebreaker "Ural" (under-construction). Structure of ice-breakers under the current project provides for the most advanced reactor facility "RITM-200" that is comprised of two reactors with thermal capacity 175 MW each one.

In April 2018 the core for the ice-breaker "Iamal" manufactured by MSZ JSC passed successfully the neutronics tests.

NCCP PJSC MANUFACTURED TWO EXPERIMENTAL FUEL ASSEMBLIES WITH ACCIDENT-TOLERANT FUEL FOR REACTORS VVER AND PWR

Experimental fuel assemblies consist of fuel elements with four different combinations of constructional materials of cladding and fuel matrix. Fuel pellets are made both with conventional uranium dioxide and with uranium-molybdenum alloy with increased density and heat conduction. Claddings of fuel elements are made of zirconium alloy with chromium plate and chrome-nickel alloy.

Pilot samples of the Russian accident-tolerant fuel passed factory and acceptance tests on the part of the sectoral commission and were shipped to Dimitrovgrad of the Ulianovsk region. In the nearest future they will be loaded to research reactor MIR at Research Institute of Atomic Reactors SRC for reactor researches.

GAS CENTRIFUGE COMPLEX (GCC) IS A GROUP OF SUBSIDIARY INDUSTRIAL ENTERPRISES PRODUCING GAS CENTRIFUGES (GC) AND ACCESSORIES FOR ENTERPRISES OF THE SEPARATION–SUBLIMATION COMPLEX

Plans for batch production of GC-9, GC-9+ and pilot batches of new advanced GC were implemented to the full extent. Batch production of the advanced GC remains the medium-term objective.

2018 MILESTONES

- attainment of the required cost price of GS at KMZ PJSC;
- at KMZ PJSC – completion of works aimed at concentration of production of gas centrifuges in one production building No.2

TABLE 18

Labor efficiency dynamics of the gas centrifuge complex, RUB mln/pers.

SUBSIDIARY COMPANIES	2016	2017	2018	2017/2018, %
Subsidiary companies	2.58	2.79	3.41	22
SPA Centrotech LLC	1.91	2.06	2.52	22

DEVELOPMENT OF NEW GCS

R&D were completed in 2018; and in the fourth quarter Centrotech SPA LLC started series production of special-purpose gas centrifuges for production of isotopes of chemical elements of light and mean atomic weight — carbon, argon, krypton, xenon, silicon, selenium, sulfur.

Gas centrifuge that was developed based on series-produced 9+ generation gas centrifuge is vastly superior to current equipment in terms of technical and engineering parameters.

First batch of new centrifuges was manufactured for PA ECP JSC — the key enterprises of Rosatom Fuel Division as regards production of stable isotopes, and the world largest manufacturer on the market.

- commissioning of the first commercial section of the upgraded gas centrifuge of 9+ generation. In total 5 sections of GC9+ were commissioned in 2018. Performance efficiency of the upgraded gas centrifuge is considerably superior to its previous version, and its production cost is lower.
- commissioning of commercial GC9+ at UEIP JSC (3 sections of the unit 61 and 3 sections of the unit 62).

2019 PLANS

- preparation to production of the advanced GC;
- follow-on works on cost improvement of GC production.

RESEARCH AND ENGINEERING COMPLEX REPRESENTS THE GROUP OF SUBSIDIARIES THAT INTEGRATE THE ACTIVITY IN THE FIELD OF IMPROVEMENT OF NUCLEAR PRODUCTION AND DECISIONS INTO THE SPHERES OF NON-NUCLEAR PRODUCTS

For detailed information on TVEL Fuel Company performance in the field of research and engineering works please refer to the Intellectual Capital.

TABLE 19

Labor efficiency of research and engineering complex, RUB mln/pers.

SUBSIDIARY COMPANIES	2016	2017	2018	2017/2018, %
VNIINM JSC	2.23	2.13	2.92	37
CPTI JSC	1.39	1.66	1.67	0
Tochmash VPA JSC	1.51	1.56	2.19	41

SECOND CORE AND NEW BUSINESSES

Based on the competences of nuclear production development TVEL Fuel Company addresses the priority task set by Rosatom State Corporation to the enterprises of nuclear industry: development of non-nuclear businesses.

It is also important that new products manufactured at the newly established productions must be in demand on out-of-the-industry markets, new for TVEL Fuel Company, outside the limits of nuclear fuel cycle. This is ensured due to application of modern and efficient technologies obtained owing to successful work in the traditional nuclear field.

New businesses generate additional proceeds, and consequently additional budget revenue that may be allocated to address different issues in the regions of presence of TVEL Fuel Company.

Establishment of new high-technology businesses makes it possible to address the variety of interlinked issues. New technologies in nuclear production offer significant advantages to TVEL Fuel Company in technological process, contributing in particular to increase in equipment capacity, rise of automation degree. This results in reduction of workforce requirements at nuclear production. Development of new non-nuclear businesses is a real opportunity to employ personnel dismissed due to optimization of main nuclear production and to ensure social stability in the regions of presence

34 at the moment TVEL Fuel Company implements **active projects for non-nuclear businesses direction,** without regard to pending themes and projects at post-investment stage

443 RUB mln
total amount of financing in 2018

13.5 RUB bln
revenue from general industrial activities

SCHEME 10

Key directions of non-nuclear activity development of TVEL Fuel Company

Metallurgy	Machine building	Chemistry	Energy storage devices	Additive Technologies
- special metallurgy - titanium metallurgy - superconductive materials - superwire	- instrument engineering - quipment for NFC and oil and gas industry	- stable isotopes - catalysts - fluorine compounds - lithium and lithium-based products	- energy storage systems based on chemical cells - electric power generators based on fuel elements - materials for Li-Ion cells	- 3D-printers - metal powders for 3D-printing - services of 3D-printing

Objectives aimed at strengthening of the Company positions on new markets require rapid growth of scientific and technical potential, which in turn implies need for improvement of R&D, projects, production, economy, promotions and sales management systems. Efforts are being made to adapt the management systems to second business core development objects.

Second business core development supposes increase of share from non-nuclear products in total revenue of TVEL Fuel Company by 2030 (at least RUB 150 bln). These are challenging plans that require concentration of resources.

Main efforts in the second business core development are connected with expansion of market presence of non-nuclear products, implementation of investment projects, transactions on acquisition of equity in companies with the required competences and potential for development. The works are on-going to create the management systems for non-nuclear businesses development.

In 2017, the works started to bring out the most challenging and large-scale activity to integrators — independent legal entities.

THE PURPOSE OF THE INTEGRATORS IS TO CONCENTRATE RESOURCES ON DEVELOPMENT OF MARKETABLE AND EFFICIENT KEY-ACTIVITY SPECIFIC BUSINESSES.

Currently there are two industry integrators.

Cathode Materials LLC — branch integrator for "Energy storage systems based on chemical cells" direction.

Product strategy of the integrator was approved in 2018. Core achievements of the main activity of the integrator:

E-TRANSPORT

- elaboration and production of the prototype of energy storage system for passenger transport, tests with the customer with confirmation of the stated specifications;
- in 2019 — coordination of series delivery of the energy storage systems for passenger e-transport.

STATIONARY ENERGY STORAGE SYSTEMS

- start of production and delivery of energy storage systems for operating DC voltage systems, including to the out-of-the-industry customers.

INTERFACTORY TRANSPORT

- first commercial supplies of Li-ion energy storage systems. Installation of new equipment on the in-site e-transport of VMZ JSC;
- new conclusions from Russian manufacturers of interfactory e-transport concerning possibility of application of the manufactured Li-ion storage systems.

RusAT LLC — branch integrator for "Additive technologies" direction.

Core achievements of the main activity of the integrator:

SALES AND MARKETING

- formation of pre-order portfolio;
- increase of the company awareness on the market due to competent application of marketing and PR-tools;
- conclusion of 20 agreements on cooperation with the market majors.

PRODUCTION

- elaboration of design documentation for commercial 3D printer RusAT 300, completion of working out of design documentation for commercial printer 600, production of two SKD sets "Printer-300" at Centrotech SPA LLC site;
- development of software for print file preparing which is notable for open architecture that enables to set the precise characteristics of print parameters and to optimize the technology for certain products;
- development of the project of engineering additive center, FEED and purchase of equipment;
- development of the project of additive center for commercial production of medical implants NIl JSC;
- coordination of printers working out for NIl JSC, UEIP JSC, RPA CNIITMASH JSC;
- formation of the team of the leading developers of Russia for creation of modular software "Virtual 3D-printer" based on Logos software;
- formation of the team on issues relating to commercial production of powders at the enterprises of TVEL Fuel Company.

HORIZONTAL INTERACTION

- coordination of liaison protocol of the integrator with enterprises within the management system of TVEL Fuel Company;
- Coordination of cooperation chains of enterprises within TVEL Fuel Company for development of competences related to additive technologies inside the industry.

New Businesses Map of TVEL Fuel Company

	DIRECTIONS	PRODUCTS	BASIC ENTERPRISES	SCOPE OF APPLICATION	SUPPLIES GEOGRAPHY	FACTORS FOR DEVELOPMENT IN 2018
Metallurgy	**Titanium metallurgy (full range titanium production)**	Seamless titanium tubes, ingots, forgings, rods, wire	ChMP JSC	Different engineering industries: aircraft engineering, ship-building, engine-building, etc., medicine	Russian Federation, Germany	– successful implementation of manufacturing program on production of rolled titanium tubular products for industrial customer Afrikantov OKBM JSC for all placed orders – organization of production (within the framework of the Contract with Hermith GmbH) of more than 40 new items of titanium products that are in demand by foreign customers – establishment of new production site and organization of production of new advanced products - metallurgical powder tantalum. Successful implementation of the contract for products delivery – commissioning of the line for production of new products – iodide hafnium – increase in demand on the market of calciferous injection materials for iron and steel industry – development and testing of the advanced items of calciferous injection materials
	Special metallurgy	Zirconium alloys	ChMP JSC	Electric Power, Machine Building, Medicine, Metallurgy	Russian Federation	
		Hafnium			Russian Federation, Great Britain	
		Calcium metal			Russian Federation, Estonia, Kazakhsta, Norway, France, Latvia, Belgium, Sweden.	
		Calcium injection wire				
		Nickel filtering elements, powders	Centrotech SPA LLC		Russian Federation	
	Superconductive materials and superwire	Superconductive wires	ChMP JSC	Electric Power, Medicine, Transportation, Telecommunications Systems	Russian Federation	
		High-strength nanocomposite superwire	Research and Production Enterprise "Nanoelectro" LLC			
Chemistry	**Production of stable isotopes**	Production of 107 isotopes of 21 chemical elements: Ar, W, Ge, Fe, Ir, Cd, Si, Kr, Xe, Mo, Ni, Sn, Os, Pb, Se, S, Te,C, Zn, B, Cr	PA ECP JSC SGChE JSC	Industries, Medicine Research of new generation elementary particles properties, Agriculture, Metrology research in geology, biology, oceanology, etc.	Russian Federation, foreign countries	– rise in demand for isotope products for international scientific projects – increase in demand for medical purposes isotope products – formation of the intergator strategy and establishment of organisational structures for its implementation – highest competences in lithium compounds reprocessing – flexible sales strategy in the unstable market conditions – improvement of national standards for clean exhaust of vehicle park – timely fulfilment of contract obligations
	Lithium and lithium–based products	Lithium hydroxide-7, lithium metal, lithium chloride	NCCP PJSC	Transportation, Electric Power, Metallurgy, Aircraft, Industries, Telecommunications Systems	Russian Federation, foreign countries	
	Materials for Li–Ion cells	Lithium Ferrophosphate	NCCP PJSC, Katodnye Materialy (Cathode Materials) LLC		Russian Federation	
		Lithium cobaltate				
	Catalysts	Electrolyte fluid for lithium batteries, lithium tetrafluoroborate	Ecoalliance LLC	Industries, Transportation	Russian Federation	
	Fluorine compounds	Autocatalysts	ECP JSC, SGChE JSC	Nuclear, oil-producing and chemical industry		
Machine Building	**Instrument engineering**	Car electrical equipment	Tochmash VPA JSC	Electric Power, Industries, Transportation	Russian Federation	– increase in demand for home-made automotive products – development of electric transport in the territory of the Russian Federation – development of "green energy" – formation of the integrator strategy and establishment of organizational structures for its implementation – development of oil and gas industry in the Russian Federation Upgrading of mining and processing directions
		Static frequency converters	Centrotech SPA LLC	Electric Power, Industries		
		Dosimeters, radiation meters				
		Controllers				
		Printed circuit boards				
		Connector boxes				
	Equipment for NFC	Ball- and screw-type plugs	Tochmash VPA JSC			
		Stop valves				
		Units and components for gas centrifuges				
	Mining industry equipment	Oil-fields equipment	Centrotech SPA LLC	Geological exploration, mining and processing of minerals		
Additive Technologies	**3D–printers**	Metal SLM 3D-printers	Centrotech SPA LLC	Space industry, Machine building, Medicine	Russian Federation	– elaboration of the Complex plan for development and introduction of additive technologies in the Russian Federation 2019–2025 – development of the project specification and federal project design passport "Establishment of scientific centers for development of additive technologies", expected scope of financing is RUB 4.4 bln.
	Metal powders	3D-printing powders under SLM, SLS and EBM technologies	Centrotech SPA LLC, ChMP JSC,			
Energy storage devices	**Accumulators and generators, fuel elements**	Lithium-ion energy storage systems, electrochemical power sources on solid fuel cells	Centrotech SPA LLC, Katodnye Materialy (Cathode Materials) LLC	Interfactory/passenger/special-purpose transport, Electric power, Telecommunications systems	Russian Federation	– Major cities' initiative to use green e-transport – substitution of conventional batteries (lead-acid) with new type batteries

NEW BUSINESSES DEVELOPMENT MILESTONES 2018

New products and technologies:

- for the first time in the word PA ECP JSC has developed and implemented the process flow of gas centrifuge nickel enrichment in radioisotope ^{63}Ni: production of the pilot batch of the products with enrichment more than 69%. The product was shipped to the customer – FSUE MCP;
- PA ECP JSC produced and delivered a new product – chrome ^{50}Cr isotope for scientific research in the field of neutrino physics;
- more than 20 thousand of disks of iridium ^{191}Ir isotope have been produced and delivered to the Customers. It is planned to increase the scope of delivery in the following years;
- ChMP JSC commissioned the facility for production of new product – iodide hafnium, mastered the industrial output of hafnium oxide and metallurgical powder tantalum; improved technology and produced pilot batches of high-purity hafnium tetrachloride for semi-conductor industry;
- printing of first sample-demonstrators using multipowder metal 3D-printer of UEIP JSC that was created with co-funding of the Ministry of Education and Science of the Russian Federation and Rosatom State Corporation;
- the integrator RusAT LLC developed the range of new 3D-printers with plot area 300x300x300;
- NCCP PJSC commissioned the facility for integrated decontamination of lithium hydroxide-7 solution with the finished product manufacturing;
- ChMP JSC successfully completed first pilot testing of the advanced filler of injection wire for liquid steel processing, new filler was elaborated as an alternative to silicocalcium;
- commencement of works on systematic introduction at the industry enterprises of new type energy storage devices;
- start of delivery of energy storage systems for interfactory transport and indoor application to outer of Rosatom markets;
- elaboration and production of the prototype of energy storage system for passenger transport, tests with the customer, and confirmation of the stated specifications with passenger e-transport on the intracity lines;
- Ecoalliance LLC elaborated technology and completed. preproduction of automotive catalysts systems intended to comply with Euro-6c environmental standard. Start of delivery of catalysts units for "pilot" and series assemblies of AURUS motor vehicles.

Delivery contracts:

- ChMP JSC concluded contracts for delivery of large runs of calcium injection wire with the leading Russian manufacturers of steel and rolled steel Severstal PJSC and MMK PJSC;
- increase in scope of delivery of titanium products for the European market within the framework of the contract with Hermith GmbH. Commercial production at ChMP JSC facilities of more than 40 new listed titanium products that are in demand by foreign consumers;
- NCCP PJSC concluded contracts with new customers, that rank among the key world manufacturers of hi-tech lithium products, for delivery of battery lithium metal to France, Korea and to the American market;
- conclusion of three-year international contract with the German company Nukem Isotopes GmbH for delivery of Germanium ^{72}Ge, which is used in semiconductor industry for microcircuit production;
- PA ECP JSC made final delivery of polycrystalline silicon ^{28}Si under the international project "Kilogram-3" for creation of new generation mass standard and determination of the fundamental physical constant "the Avogadro constant";
- Centrotech SPA LLC concluded contract with major manufacturer of electric transport for serial supply of the sets of energy storage system for passenger e-transport;
- large run of Molybdenum ^{100}Mo isotope was delivered for international scientific project "AMoRE" for research of neutrino properties. In 2019 supplies of this isotope will continue.

Cooperation agreements:

- Agreement on scientific and technical cooperation in the field of additive technologies was signed between RusAT LLC and German company Oerlikon AM Gmbh within the forum "ATOMEXPO 2018";
- RusAT LLC and VIAM FGUP (All-Russian Institute of Aviation Materials Federal State Unitary Enterprise) signed the agreement on cooperation in the sphere of elaboration of the Russian additive equipment to form the complete cycle of the parts manufacturing based on the unified principles;
- Within the V International Forum NDEXPO 2018 RusAT LLC concluded mutual cooperation agreement with 3D Systems - the company-manufacturer of 3D-printers and the Center of Additive Technologies of Rostec State Corporation.

ROSATOM PRODUCTION SYSTEM

TVEL Fuel Company has always been concerned with special approaches to production and management processes in order to implement the strategic goals of Rosatom with regard to the orders portfolio expansion, to maintain efficient production under conditions of severe and ever-growing competition on the global markets.

Rosatom Production System (RPS) is the culture of lean manufacturing and continuous improvement of processes aimed to reveal and reduce all losses in production and business processes, and to ensure competitive advantage on a global scale.

Continuation of implementation of the Program for operation efficiency increase in order to attain the strategic goals of Rosatom State Corporation and TVEL Fuel Company in 2018. In order to deal with primary objectives on cost saving all enterprises selected main products flows where the main goals are as follows: reduction in the lead time and in the volume of work in progress, increase in efficiency and quality of the products.

Starting from 2015, Rosatom State Corporation applies the system-based approach to deploy RPS at the pilot enterprises of the industry. The enterprise within the system deployment of RPS receives the status of RPS-enterprise subject to certain performance indicators. According to the concept of development, all RPS-enterprises implement the integrated package of RPS-arrangements, and are subdivided as follows: RPS Leader, RPS Candidate, RPS Reserve.

SCHEME 11

RPS Principles

TABLE 20

Results of implementation of the Program for operation efficiency increase

INDICATOR	2018 (ACTUAL)	2017 (ACTUAL)	% of objective fulfilment in 2018
Brief of arrangements/projects aimed at cost saving, RUB bln (on an accrual basis)	−3.11*	−0.927	95
Brief of arrangements/projects aimed at inventory reduction, RUB bln (on an accrual basis)	−15.1*	−10.68	120
Brief of arrangements/projects aimed at reduction in labor intensity of the process staff, %	−5.3*	−3.1	106
PT Reduction by key products, % (on an accrual basis)	−36	−31	120
Level of objectives fulfilment of the development strategy of the products flow of the enterprises, %	99.6	100	118

* Values on an accrual basis from 2017.

The integrated package of RPS arrangements provides for:

- setting clear objectives to the employees to the level of small group leaders based on scope definition of the enterprise, division, sector;
- RPS methodology training of the managers of the enterprises, participants of the projects, site training;
- development of the product flows of the enterprises, creation of RPS-patterns of the flows;
- implementation of RPS projects in office and at production site under a single methodology;
- incentive and development programs for different level employees;
- development of enterprises-suppliers;
- development of RPS-engineering at construction facilities.

In 2018 7 enterprises of TVEL Fuel Company renewed their RPS-Leader status – MSZ JSC, UEIP JSC, KMZ PJSC, SGChE JSC, PA ECP JSC, ChMP JSC, NCCP PJSC, and 1 enterprise AECC JSC – received RPS Leader status.

8 enterprises of TVEL Fuel Company renewed their status of RPS Leader in 2018

In the reporting period TVEL Fuel Company **OPENED AND IMPLEMENTED MORE THAN 760 RPS PROJECTS** intended to address the issues of the product flows and to improve efficiency of all business processes. More than **90% OF THE MANAGERS** of the Company were involved in the project activity. The economic effect from implementation of RPS-projects **MADE RUB 703.4 MLN**

DIAGRAM 13

Number of employees of the enterprises of TVEL Fuel Company trained in RPS principles and instruments

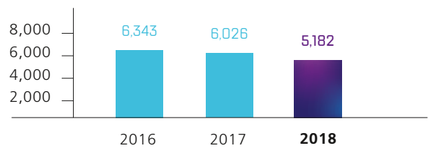


TABLE 21

Major RPS projects implemented in 2018

ENTERPRISE	PROJECT	RESULTS
TVEL JSC MSZ PJSC NCCP PJSC ChMP JSC PA ECP JSC UEIP JSC SGChE JSC AECC JSC	Project group for optimization of through product flows	- PT reduction for the key flows in 2018 by 6% (37% on an accrual basis starting from 2017) - Stock reduction (NM, Zr) in key flows in 2018 by RUB 5,018 bln (RUB 15.1 bln on an accrual basis starting from 2017)
TVEL JSC ChMP JSC NCCP JSC MSZ JSC	Customer relationship in zirconium products delivery chain	- Zr-products stock reduction at the warehouses by 33.7% - Attainment of the target level for on-time delivery accuracy 95.1% - Economic benefit under the project made RUB 526.3 mln

QUALITY ASSURANCE

TVEL Fuel Company has introduced and implements the Integrated Management System, that applies to all enterprises and includes corporate system of quality management, environmental management, health care and occupational safety quality management, and energy management.

Elaboration and introduction of standards for effective operation of the Integrated Management System based on requirements of international standards ISO 9001:2015, ISO 14001:2015, ISO 50001:2011, BS OHSAS 18001:2007, IAEA requirements, and requirements of the customers.

The main strategic goal of the Company in this sphere is continuous improvement of the product quality and operational safety aimed at maximum compliance with the customers' requirements, that allows to expand the markets, ensure sustainable growth of subsidiary companies. The set of measures and procedures focused on effective operation of the quality management system has been elaborated and introduced in this connection; customer feedback is maintained to develop and improve the activity of TVEL Fuel Company; customers' satisfaction assessment is carried out on an annual basis.

TVEL JSC and its subsidiaries introduced **safety culture** as the component of the corporate quality management system in accordance with international requirements and standards of IAEA. External evaluation and development of actions aimed at improvement of the safety culture

RESULTS 2018

Successful compliance assessment of the quality management system of TVEL JSC, MSZ PJSC, NCCP PJSC, ChMP JSC and VNIINM JSC with requirements of the American standard ASME NQA-1.

Arrangement and performance of audit of the quality management system of TVEL JSC and subcontractors on the part of the foreign partners and customers (USA, Finland, Turkey, Sweden, Czech Republic, Belarus, Hungary, Russia - Engineering Company ASE JSC). Positive reviews were received following the results of the audits, TVEL JSC was qualified as the supplier of nuclear fuel.

In 2018 inspections of Novovoronezh NPP, Smolensk NPP, Leningrad NPP were performed in cooperation with representatives of TVEL JSC, reports were made for all audits

In 2016-2017 the set of actions was implemented for elaboration and updating of TVEL Fuel Company standards to provide compliance with requirements of the international standards ISO 9001 and ISO 14001, rev. 2015. In 2018 following the results of the audit on the part of the international certification authority (TÜV Thüringen e.V.), the Integrated Management System of TVEL Fuel Company was approved to comply with requirements of the international standards ISO 9001:2015, ISO 14001:2015, ISO 50001:2011, BS OHSAS 18001:2007 for the 3 subsequent years.

Number of nonconformities of products and component that were revealed by the Quality Control Department and representatives of the customer at manufacturing plants decreased (161 – in 2016, 10 – in 2018).

In 2018 following the results of the audit by TÜV Thüringen e.V. (the international certification authority) the Integrated Management System of TVEL Fuel Company was approved to comply with requirements of the international standards ISO 9001:2015, ISO 14001:2015, ISO 50001:2011, BS OHSAS 18001:2007 for the 3 subsequent years

Development of standards of TVEL Fuel Company that regulate activity in the sphere of risks management in the corporate management system of quality and environment in accordance with requirements of ISO 30001:2010 and provisions of Rosatom State Corporation. Current policies, standards and process maps of the Company were updated in compliance with risk-oriented governance model

DIAGRAM 14

Number of revealed nonconformities, pcs.

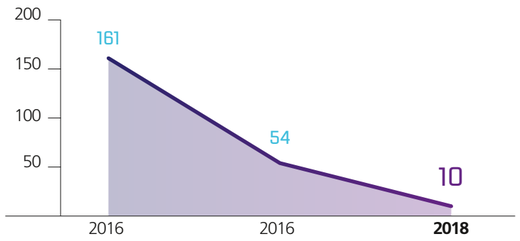
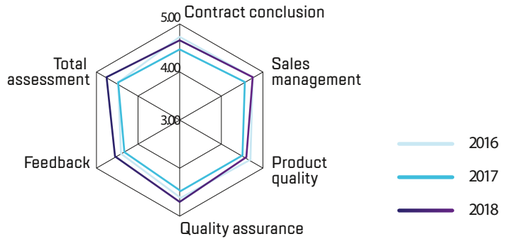


DIAGRAM 15

Customers' satisfaction assessment, points



Customers' satisfaction assessment was carried out in the reporting period. Main customers that took part in the assessment:

- Hungary (MVM Paks NPP CJSC, Centre for Nuclear Research);
- Czech Republic (CHEZ a. s., ALTA a.s., Dukovany NPP, Temelin NPP);
- Slovakia (Slovenské elektrárne JS);
- Bulgaria (Kozloduy NPP);
- China (JNCP);
- Finland (Fortum Power and Heat Oy);
- Kazakhstan (Institute of Nuclear Physics);
- Ukraine (Institute for Nuclear Research (NASU) Ukraine);
- Korea (Institute for Nuclear Research);
- Turkey (Akkuyu NPP);
- Uzbekistan (Institute of Nuclear Physics).

The average index of the customers' satisfaction level in 2018 was 4.80 points of 5 available (in 2017 – 4.49).

There were no claims or complaints filed by the customers in 2018. No events of non-compliance with regulations and voluntary certification concerning impact of the products and services on health and safety were revealed

INTELLECTUAL CAPITAL

Scientific and engineering efforts of TVEL Fuel Company are aimed at development of new types of nuclear fuel and structural materials, and innovations development in non-nuclear sphere

The main goal of the scientific and engineering efforts of TVEL Fuel Company is to ensure competitiveness of the products and safety of production and operation.

The research and development (R&D) scope of the Company is defined by the decisions of the management of Rosatom State Corporation, contractual obligations, and is subject to revision on an annual basis at the meetings of the Scientific and Technical Council No. 2 of Rosatom State Corporation - "Nuclear Materials and Technologies of Nuclear Fuel", the STC of TVEL JSC sections.

INNOVATIVE ACTIVITIES IN THE NUCLEAR INDUSTRY

Innovative activity in the nuclear industry has crucial significance for long-term competitive ability and business continuity of TVEL Fuel Company because the services and the products of FE NFC form the basis of corporate activity.

As regards active and newly commissioned NPP power units, the activity is aimed at:

- increased burnup fraction of unloaded nuclear fuel;
- improved operating life of FA;
- improvement of nuclear fuel operation reliability;
- proving FA operating efficiency under the conditions of the increased capacity of power units (for VVER-1000 to 107% from Nnom) subject to safety assurance.

New markets entry strategy is ensured by activity aimed at creation of new types of gas centrifuges, improvement of TVS-KVADRAT design (for PWR reactors), new types of fuel for research reactors, new cores for nuclear-powered icebreakers.

SCHEME 12

The main areas of scientific and technical activities of TVEL Fuel Company

Improvement of existing structures, creation of new types and technologies of nuclear fuel production

Design and technological development of the separation-sublimation complex

Innovative activities in the non-nuclear industry

Major R&D directions:

- design and improvement of nuclear fuel and reactor cores of Russian design (primarily VVER-1000/1200/1300);
- design of nuclear fuel for Western reactors (PWR);
- design of nuclear fuel for low-capacity nuclear power stations, research reactors and nuclear-powered icebreakers.

RESULTS OF IMPLEMENTATION OF THE PROJECT "MOVING TOWARDS ZERO FAILURE" IN 2018

In the reporting period, a trend toward decrease in cases of FA failures is noted on NPP power units with VVER-100.

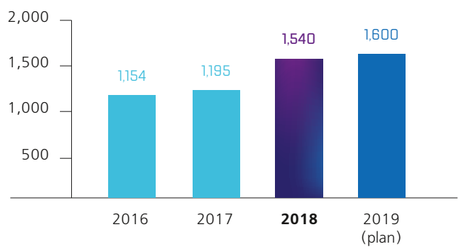
Increase in number of failed fuel assemblies on NPP with VVER-1000 reactor was 23.5% in 2018.

In 2018, the indicator of the parameter "Number of power units VVER-1000 without nuclear fuel failure" was 79%.

Manufacturing plants carried out remedial actions following the results of the audit by Rosenergoatom Concern JSC, and implemented recommendations based on the results of the partners' experts visits. Technical documentation (specification, operation manuals, design documentation and production processes) were adjusted. Fuel assemblies' operation experience proved accuracy of technical solutions underlying the design; design criteria provide compliance with the requirements of the regulatory documents for safe operation of fuel assemblies.

DIAGRAM 16

Investments into R&D by TVEL JSC, RUB mln



OPERATING RESULTS 2018 ON IMPROVEMENT OF NUCLEAR FUEL PROPERTIES AND PRODUCTION TECHNOLOGIES

With regard to design and introduction of nuclear fuel and cores of Russian power reactor:

- commencement of operation of the improved TVSA-T mod.2 on the unit No.2 of Temelin NPP (Czech Republic) (improved fuel-element cladding, fuel pellets have no center opening, reinforced frame with 12 spacer grids and 3 mixing grids);
- commencement of operation of TVS-2M (12 pieces) with labyrinth anti-debris filter (ADF-2) on the unit No.1 of Rostov NPP;
- launch of production of the improved TVS-2M (with mixing grids and profiled fuel elements) for operation conditions at the capacity level 107% from nominal capacity;
- completion of operational-life and hydraulic testing of RK and FA prototypes with enhanced water-uranium ratio (outer diameter of fuel elements – 8.9 mm) for Paks NPP and Loviisa NPP;
- completion of the set of studies to substantiate application of the alloys E110 and E125 based on zirconium sponge as the component material of fuel assembly for RBMK-1000.

With regard to development of accident-tolerant fuel:

- implementation of the investment project "Research and development of the process for production of new generation pressurized fuel elements on silicon carbide";
- production of two experimental fuel assemblies under the investment project "Development of accident-tolerant fuel". Each assembly contains 24 normal fuel elements for VVER and PWR types with four combinations of cladding materials and fuel composition. Fuel pellets are made both with conventional uranium dioxide and with uranium-molybdenum alloy with the increased density and heat conduction. Claddings are made of zirconium alloy with chromium plate, and of chrome-nickel alloy. Assemblies will be tested in the water loops of the research reactor MIR in the Research Institute of Atomic Reactors SRC JSC.

2019 PLANS FOR NUCLEAR FUEL DESIGN AND IMPROVEMENT

Within introduction of the improved and new nuclear fuel and cores of NPP with VVER-1000/1200/1300 and VVER-440 reactors:

- development of calculation and design documentation for TVS-2006 and safety justification for transfer of Novovoronezh NPP-2 from 12- to 18-month fuel cycle;
- implementation of the "Program of experimental and theoretical computation studies for justification of extended dry storage of new type fuel assemblies";
- experimental and calculation studies of re-fabricated fuel elements behavior under conditions of reactivity accident based on tests in MIR reactor in order to ensure licensing of fuel with the enlarged uranium content;
- completion of pilot operation of TVSA-12PLUS on the unit No.3 of Kalinin NPP. Preparation of decision of transfer of all units of Kalinin NPP to TVSA-12PLUS loading;
- elaboration of engineering materials to justify operational capability and safety of pilot operation of fuel elements with REMIX-fuel with TVS-2M;
- justification of pilot operation of the batch of TVS-2M, which consists completely of fuel elements with REMIX-fuel, with the core of VVER-1000 reactor, and working out of Supplement to Standard Safety Case List of NPP;
- determination of kinetics of radiation resintering of uranium-gadolinium fuel of VVER with regulated density and submicron porosity within temperature range 650–700°C to ensure design criteria and fuel licensing;
- post-irradiation studies of TVS-2M (with fuel elements with claddings of new zirconium alloys) spent at Balakovo NPP;
- working out of substantiation documentation to start commercial production of the third generation cartridges and implementation of local parameters control on the Units No.3-4 of Kolsk NPP;
- working out of substantiation materials for introduction of jacketless assemblies RK-3+ on Dukovany NPP.

"PRORYV" PROJECT

Owing to current achievements the Russian Federation holds all competences and displays high-scale technological availability to maintain innovative development of two-component nuclear power industry with reactors on fast and slow neutrons with closed nuclear fuel cycle. "Proryv" project is the key component to this strategy implementation; its purpose is to develop the technology and to present the possibility of nuclear fuel cycle closure based on fast-neutron reactors. Closed fuel cycle will make it possible to increase efficiency of application of natural uranium, to solve the problem of SNF accumulation and to provide the mankind with reliable and long-term green power source.

R&D of the project stream "Proryv" in 2018:

- continuation of tests with innovative mixed nitride uranium plutonium fuel (SNUP-fuel), resulting in designed burn-up;
- post-irradiation studies of the irradiated SNUP-fuel, resulting in permit for life extension of ETVS-11 in BN-600;
- development and approval of R&D program on attainment of burn-up range up to 12% ha.
- release of the second draft of FNP (Federal Rules and Regulations) and Standards specific for the objects of new technology platform of nuclear power industry.
- part of design codes required to justify safety of BREST-OD-300 reactor were verified and submitted to attestation by RTN.

With regard to capital construction in 2018:

- completion of state expert assessment of the adjusted design documentation for construction of the power unit with BREST-OD-300 reactor;
- project documentation for creation of training and information center has been elaborated, examined and approved; the centre is intended for training and maintenance of the required high level qualification of the operating staff of reactor and SNUP-fuel fabrication/refabrication module.
- completion of delivery of main non-standard equipment for SNUP-fuel fabrication/refabrication module; the delivered equipment is unique and is unrivalled throughout the world;
- completion of construction works of main production building of SNUP-fuel fabrication/refabrication module.

With regard to fuel for fast reactors BN-600 and BN-800:

- implementation of elaborated and approved by Rosatom State Corporation R&D programs for increase of fuel life of BN reactors and formation of BN-800 core with full loading with MOX-fuel.

SECOND BUSINESS CORE DEVELOPMENT

Objectives aimed at strengthening of the Company positions on new markets require rapid growth of scientific and technical potential, which in turn implies need for improvement of R&D, projects, production, economy, promotions and sales management systems. Efforts are being made to adapt the management systems to second business core development objects.

TVEL Fuel Company is engaged in development of innovative areas of activities, such as additive technologies, new materials and alloys, new types of isotope products, energy generators and storage units, small-size gas turbine plants. The Company intends to increase revenue from sales of innovative products from current level equal to RUB 800 mln to RUB 3,500 bln by 2020, subject to successful implementation of investment projects and implementation of M&A plans.

Creation of new non-nuclear products is accompanied by scientific-research and engineering activity. Scope of financing of non-nuclear businesses R&D in 2018 made RUB 134 mln.

R&D financing is associated with current objectives and plans for coming period. Changing market environment and need for economic risks management are also taken into consideration, that is why scope of R&D financing is subject to adjustment on an annual basis. R&D is being implemented with co-funding on the part of the Ministry of Education.

REMIX-FUEL

REMIX-fuel is the innovative type of fuel. In January 2018 the scientists of the sectoral research institutes tested the state of the fuel assemblies (standard TVS-2M were loaded) with REMIX-fuel in the reactor of the third unit of Balakovo NPP. The results proved operation capability of the pilot fuel assemblies with innovative fuel, no constraints were found for further operation of assemblies.

In 2019 it is planned to start adjustment of the technologies and production of fuel assemblies consisting completely of REMIX-fuel.

By 2025 it is planned to establish pilot production of REMIX-fuel to provide loading of Russian VVER-1000/1200 reactor, and to gain reference experience in production and operation of REMIX-TBS.

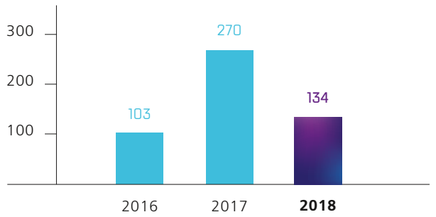
In case of successful results of the pilot operation, the fuel can be used on VVER-1000/1200 reactors after 2030, and international market entry is possible.

MOX-FUEL

First batch of fuel assemblies with pellet MOX-fuel for BN-800 reactor was produced and tested in 2018 at FSUE MCP – there were manufactured 8 fuel assemblies.

DIAGRAM 17

Scope of non-nuclear businesses R&D financing, RUB mln



Amount of co-funding in 2018 made RUB 58 mln.

Main R&D areas for non-nuclear businesses development in 2018:

- development and creation of 3D printer;
- development of low-power gas turbine engines;
- development of technology and creation of pilot-plant for lithium hydroxide production using electrochemical conversion of lithium salts;
- development of extraction technology for lithium isotope separation;
- development of new titanium alloys and articles made therefrom;
- development of mass-produced GC design for separation of isotopes of the 8th group (iridium, nickel);
- experimental irradiation of ^{62}Ni for production of ^{63}Ni and processing of the obtained material;
- development of technology for production of high-capacity condenser-type tantalum powders.

Milestones with regard to development of non-nuclear businesses are presented in the report in the section “Second Core and New Businesses”.

AGREEMENT ON INNOVATIONS

During national mining forum “GORPROMEXPO-2018” in Moscow VNIINM JSC, RusAT LLC and Mine Operators of Russia Non-commercial Partnership signed the agreement on innovations.

The main objective of the agreement is coordination of programs and plans of the parties in the sphere of acceleration in scientific and technological development of Russian mining complex based on realization and application of the advanced design-and-engineering and technological solutions, results of scientific research in the field of material science, additive technologies, surface engineering and renovation.

For TVEL Fuel Company this agreement means promotion of own developments and technologies to the new promising market of upgrading of enterprises of the mining complex, import substitution of equipment and products applied for survey, production, processing of mineral resources.

In the opinion of the parties the agreement is considered efficient and mutually beneficial cooperation in scientific-technological and information spheres and the investment project activity for benefit of the innovative development of the mining industry of the Russian Federation.

TVEL FUEL COMPANY EXPANDS THE COMPETENCES FOR RADIO ISOTOPES PRODUCTION

New industrials directions and sales markets for products and services were developed in the vector of accomplishment of strategic goals of Rosatom State Corporation.

For instance, the range of isotope products of PA ECP JSC was enlarged with new isotope – Chrome ^{50}Cr. This is the 21st element of the periodic table within the competence of the isotopic enrichment of the enterprises. On the request of the Institute of Nuclear Research of the Russian Academy of Sciences, that coordinates BEST (one of the most global scientific experiments in the sphere of investigation of properties of the most mysterious for modern physicists elementary particle – neutrino) there was mastered the technology of ^{50}Cr production in the form of chromic anhydride CrO3.

Other advanced projects were also successfully implemented. For the first time in the word specialists of PA ECP JSC developed and implemented the process flow of gas centrifuge nickel enrichment in radioisotope ^{63}Ni.

Large lot of Germanium ^{76}Ge isotope was shipped under the tender for international scientific project LEGEND (GERDA) for investigation of neutrinoless double beta decay properties. Product with enrichment more than 90% was developed and shipped for scientific purposes. Winning of a German tender organized by participants of LEGEND project. Isotope under this contract will be delivered in February 2019.

Conclusion of three-year international contract with the German company Nukem Isotopes GmbH for delivery of Germanium ^{72}Ge isotope, which is used in semiconductor industry for microcircuit production.

In 2019 PA ECP JSC will celebrate the 55th anniversary of adoption of the most efficient gas centrifugal technology. First gas centrifuges started operation on June 4, 1964. This is a millstone for the whole industry, because **PA ECP JSC was the first in the world to apply gas centrifugal technology for production of non-uranium isotopes**. In October 1971 the enterprise produced several tens of grams of ^{57}Fe Ferrum isotope with 80% enrichment. Today the plant holds the competences for production of 107 stable isotopes in industrial-scale volumes.

SCIENTISTS OF VNIINM JSC CREATE HOME-MADE TRITIUM BATTERY

VNIINM JSC participates in development of Russian beta-voltaic power source based on tritium. Scientists of the institute are engaged in development of isotope component of this product.

Technology has been suggested by the specialists of VNIINM JSC, and supposes application of radioactive hydrogen isotope — tritium as the power source. Tritium suits perfectly to solve the problem, because it is radioactive (half-life period is 12,3 years), however its beta-radiation is rather mild and does not destroy the structure of semi-conducting materials, which allows preserving of operational characteristics of the battery up to 15 years. Such tiny and trouble-free power source, which is independent of any environmental conditions, is highly-demanded and can be marketable both for space industry and other fields of science and engineering.

For VNIINM JSC participation in this project is the result of long-term engineering study, and contributes to the image making of the whole industry, and on national bases it enables handling of the urgent issue of import-substitution because currently Russia does not manufacture similar electric power supply sources.

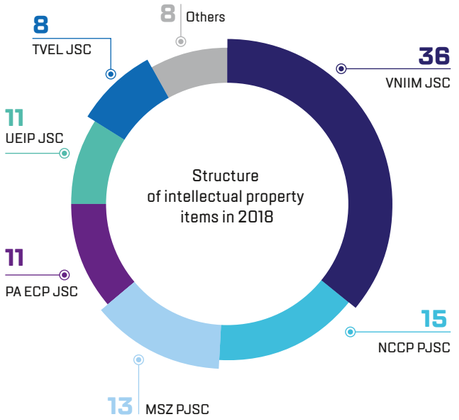
INTELLECTUAL PROPERTY

As of the end of 2018 TVEL Fuel Company holds 1,774 items of intellectual property. The objects protected by the law include inventions, utility models, production secrets (know-how), software for electronic computing machines, databases, trademarks and industrial designs.

Assessment of the intellectual property items, the system of identification and legal protection of intellectual property items, created by the enterprises of the Fuel Company, are performed in compliance with the requirements of Russian Federation legislation, Standard Industry Methodological Recommendations and local regulations together with "Nauka and Innovatsii" (Science and Innovations) JSC, the Division for Innovations Managements of Rosatom State Corporation.

Functions of identification and legal protection of the items of intellectual property are assigned to the Patent and Licensing Department of TVEL JSC, as well as to technical departments, development design offices, intellectual property protection teams and patent-information departments of the Company's enterprises.

DIAGRAM 18



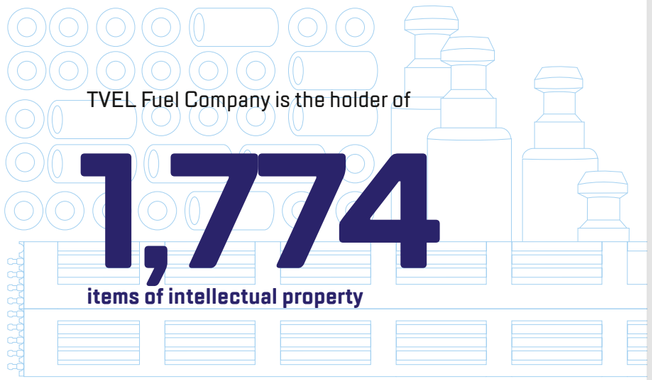


TABLE 22

Number of registered inventions, utility models, industrial designs and production secrets (know-how), ea.*

Items of intellectual property	2016	2017	2018
Russian Inventions	37	40	25
Foreign Inventions	3	1	8
Russian Utility Models	3	5	4
Foreign Utility Models	0	0	0
Russian Industrial Designs	0	0	0
Foreign Industrial Designs	0	0	0
Production Secrets (Know-How)	61	62	45

* Data for the years 2016-2017, published in the Annual Report preceding the reporting period, are clarified. This Annual Report presents updated data.

In order to develop academic competences of young specialists VNIINM JSC organized the work of the branch of the academic department No.9 of MEPhI NRNU "Physical Aspects of Material Science". The lecturers of the branch are leading scientific workers of VNIINM JSC, experts in relevant fields of science. Office of the academic secretary provides organization, coordination and maintenance of the training process of the branch students.

In 2018 10 students received training at the branch of the department (5 students of specialist degree course and 5 students of master's degree course) under the following programs:

- Special Issues of Material Science;
- Construction Materials of Nuclear Reactors;
- Science of Superconducting Materials/ Superconductors Technology

CORPORATE SCIENCE

Main objectives set to the scientific organizations of Rosatom are connected with promotion of nuclear industry innovative development, growth of competitive ability of Russian products and services on the nuclear power market and on the market of radiation technologies due to improvement of the existing technologies and technical re-equipment of production capacities. These objectives can be accomplished by improvement of research and development efficiency, and by active commercialisation of the research results.

The United R&D Centre (RDC) has been established by TVEL Fuel Company at VNIINM JSC; the high-priority objective of the centre is development of new types of fuel.

VNIINM JSC is engaged in re-equipment and development of infrastructure of research complex, and provides training and re-training of scientific-pedagogical personnel of higher qualification (on-the-job) under the license to carry out educational activity (d/d May 28, 2015, registration No.1449).

INTERACTION WITH THE RUSSIAN ACADEMY OF SCIENCES

By the order of Federal State Budgetary Institution of Science Joint Institute for High Temperatures of the Russian Academy of Sciences (OIVI RAN) the work was carried out on the theme "Creation of manufacturing science for SNF plasma processing (stages 2017–2018): development of principal process scheme, design of laser evaporator and system of correction of magnetic field". Purpose of the work:

- creation of the foundation for technology of SNF plasma processing, including development of principal process scheme;
- development of the design of experimental equipment for evaporation of separated composition of substances.
- improvement of the experimental facility for laboratory try-out on inactive materials of plasma separation.

The obtained results can be applied to solve the problems of closed fuel cycle and to improve safety of nuclear industry.

During the first cycle of business-acceleration, from September to December 2018, there were filed 42 applications, and 16 of them were admitted to face-to-face review stage. Following the results of selection seven projects passed acceleration, and three projects proceeded to investment stage. Among the submitted project there are: Chinese bushings and implants of zirconium dioxide for oil industry and medicine, multipurpose plasma cutter for deep-water operations, titanium powders for 3D print, electrolysis unit for production of high-purity hydrogen, drilling mud cleaning system, and FDM technology for 3D printing

SCHEME 13

Goals of Accelerator

+30% to growth dynamics

9 MONTHS Cycle from idea to pilot sample

- Reduction of "failure" risk
- New competitive commercial products
- Staff involvement and motivation

INVOLVEMENT OF UNIVERSITIES IN IMPLEMENTATION OF INVESTMENT PROJECTS

Non-nuclear businesses are being developed in innovative areas of activities. Participation of the core universities of Rosatom State Corporation makes it possible to attract the most ambitious teams and scientific research results.

In 2018 within the framework of implementation of the investment project "3D printers production design" R&D was completed for creation of automated complexes of layer-by-layer synthesis of geometrically-complex metal parts (3D printer) with involvement of the leading universities of the Ministry of Education of the Russian Federation (MISiS and the Institute of Laser and Welding Technologies of Saint-Petersburg State Polytechnic Institute).

BUSINESS-ACCELERATOR

An infant business-accelerator for startups and new ideas started its activity in TVEL Fuel Company. This advanced type of search, selection and financing of innovative projects is intended to provide rapid development of non-nuclear businesses; to reduce the time of production, to promote to disclosure of the best ideas and attraction of specialists both within and outside the Company, to pass to open innovations model. The expected result is increase in revenues from "the second core" of business and increase of share on new markets.

Business-accelerator model of TVEL JSC supposes partial financing of the best projects due to attraction of financial resources on the part of venture funds and development institutions. There are provided different forms of TVEL JSC participation in the investment projects: from equity investment of startup-company to employment of the project team of the authors of the idea.

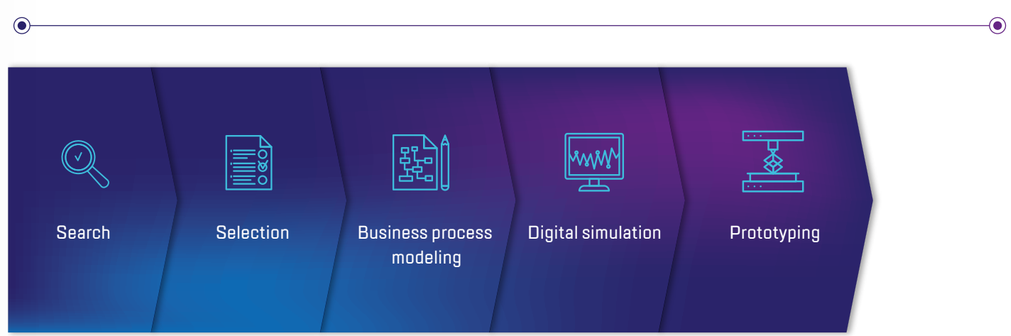
Following the results of the pilot cycle of business-acceleration, volume of client agreement amounted to more than RUB 3 bln, confirmed proceeds on the methods of TVEL JSC business-accelerator is estimated almost to RUB 300 mln, and nearly RUB 150 mln of investment money budgeted for the projects prior to acceleration program were saved on creation of products prototypes.

Later on in order to attract participants and receive applications to accelerator it is planned to create specialized web-portal, and now an application for review by the experts of accelerator can be filed by e-mail:

ba@tvel.ru

SCHEME 14

Stages of Business-Accelerator



500+ attracted ideas

100+ developed ideas

20 projects for business process modelling (BM)

10 projects for digital simulation (TsM)

5 projects with prototype

3 projects for growth

HUMAN CAPITAL

Business development is entirely dependent on professionalism, high responsibility and conscientious behavior of employees, therefore human capital if the key factor in the success of TVEL Fuel Company operation. The company is focused on continuous improvement of labor relations, creating conditions for efficient and safe work, ensuring career growth, a decent living standard and social well-being of employees in all enterprises included into the company management system

Principles of HR management ensuring the achievement of strategic goals

- Caring for people
- Partnership
- Security

HR POLICY

HR Policy of the Company is intended to ensure steady growth of labor efficiency, the balance between the interests of its employees and the employer, rational use of professional and management capabilities in accordance with the long-term development strategy of the Company.

Midterm HR Policy Development Plans:

- development and further improvement of safety culture;
- provision of incentive tools efficiency;
- development of professional qualifications system;
- development of the corporate culture;
- promotion of the employer brand.

STAFF COMPOSITION

The target staff figures are growing, which is due to the rapid development of general industrial activities. The production and provision of non-nuclear services entail not only the development of new markets outside NFC, but also the need to create substitute high-tech industries for the released qualified staff.

DIAGRAM 19

Average Headcount of TVEL Fuel Company, pers.

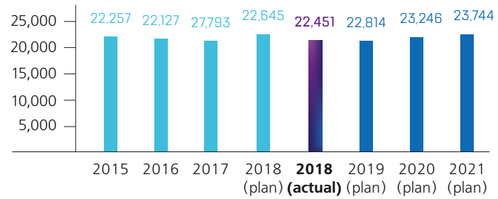


TABLE 24

Key indicators of the headcount of the TVEL Fuel Company

INDICATOR	2016	2017	2018 (plan)	2018 (actual)	2018/ 2017, %	2019 (plan)
Headcount at the year-end, persons	21,843	21,391	–	22,469	5.0%	–
Average Headcount, persons	22,127	21,793	22,645	22,451	3.0%	21,883
Candidates and Doctors of Science, persons	260	284	280	264	–7%	270
Employees employed in the industry for more than 5 years, %	84	82	82	86	4.9%	–

In 2018, 2,779 workers were employed by TVEL Fuel Company: 1,672 of hired employees are men, 564 – persons under 30 years old. The largest share of the hired employees is in Vladimir region (1,194), the smallest share – in Irkutsk region (34).

Major part of the employees are men (66%)*. Average age of the Company employees is 45. The employees under 35 years old comprise 20.8% of total staff.

* 84.3% of top managers in TVEL Fuel Company are men

TABLE 23

Employee Turnover*

INDICATOR	TOTAL	Moscow	Moscow region	Vladimir region	Udmurt Republic	Novosibirsk region	Sverdlovsk region	Tomsk region	Krasnoyarsk territory	Irkutsk region	UNDER 30 YEARS OLD	30–50	ABOVE 50 YEARS OLD	M	F
Number of voluntary dismissals	**772**	106	60	213	33	9	39	41	259	12	137	499	136	473	299
The turnover rate, %	**3**	6	1	11	1	1	1	1	10	1	8	2	2	2	3
Number of workers who left the company for any reasons	**2,621**	207	320	955	236	45	152	199	451	56	361	1,247	1,013	1,472	1,149
Retirement rate, %	**12**	12	8	51	8	3	4	6	18	6	23	9	13	9	15
Number of hired persons	**3.044**	420	428	1,194	261	48	233	122	304	34	592	1,834	618	1,836	1,208
Hired workers turnover, %	**14**	24	10	64	8	4	7	4	12	4	38	8	8	12	15

* Data on the number of retired employees and the number of hired employees include the transfer of employees between Tochmash VPA JSC and KMZ PJSC.

91% staff density

2.4% unwanted staff turnover

45 years
average age of employees

20.8% young specialists under 35 years

TVEL Fuel Company hires mainly the local residents in the territories of presence, and involves specialists from other regions only if and when no properly qualified candidates are available at the local labor market.

DIAGRAM 20

Composition of top management in TVEL FC subsidiaries by residence in the reporting year, %

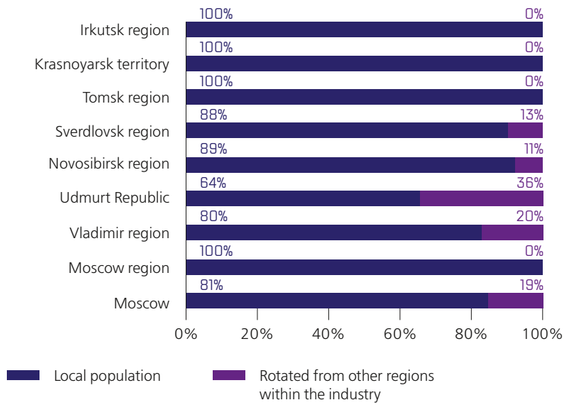
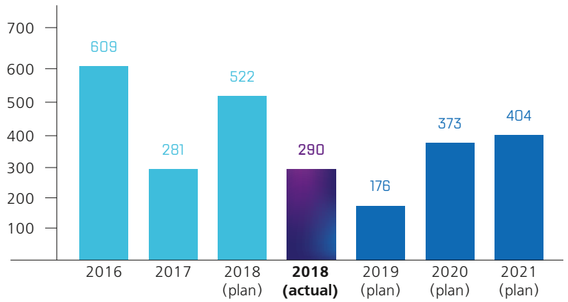


DIAGRAM 21

Jobs creation in TVEL Fuel Company*



* Creation of new staffing positions at Fuel Company enterprises of the ongoing and new projects is indicated.

STAFF INVOLVEMENT

Much attention is given to personnel engagement in the industry. Personnel engagement, employees involvement in business and success of the Company have direct effect on business performance and efficiency. Engagement study is conducted annually at enterprises of the division and the industry under the unified industrial slogan: "Rosatom Cares About Your Opinion". In general, annual surveys allow to estimate staff sentiments at the enterprise, to assess satisfaction with work conditions by 19 factors, and to determine the share of involved employees, who:

- recommend their company as a good employer to their relatives and friends;
- strive to do the best job they can, improve production processes and come up with improving proposals;
- intend to keep being employed by the Company in future.

TABLE 25

Average headcount in key production enterprises of TVEL FC in 2017, pers.

ENTERPRISE	
Angarsk Electrolysis Chemical Complex (AECC JSC)	888
Electrochemical Plant (PA ECP JSC)	1,917
Siberian Group of Chemical Enterprises (SGChE JSC)	3,325
Ural Electrochemical Integrated Plant (UEIP JSC)	2,145
Total per SSC	**8,275**
Machine-Building Plant (MSZ PJSC)	4,090
Novosibirsk Chemical Concentrates Plant (NCCP PJSC)	1,342
Chepetsky Mechanical Plant (ChMP JSC)	3,061
Total per NFFC	**8,493**
Kovrov Mechanical Plant (KMZ PJSC)	452
Total per GCC	**452**
Centrotech SPA LLC	1,059
Bochvar Institute (VNIINM JSC)	911
Tochmash VPA JSC	1,626
Total for Research Complex	**2,537**

DIAGRAM 22

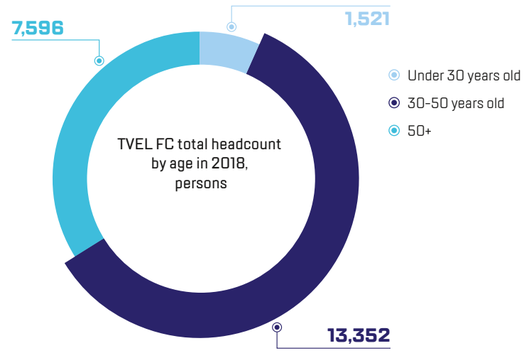
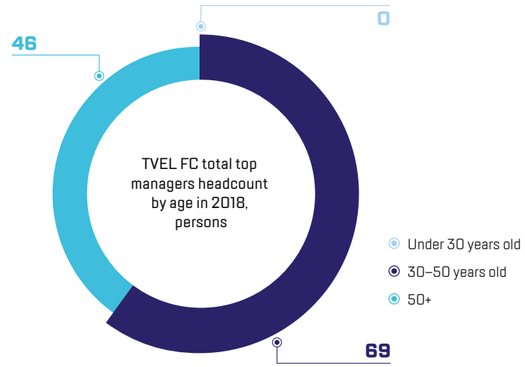
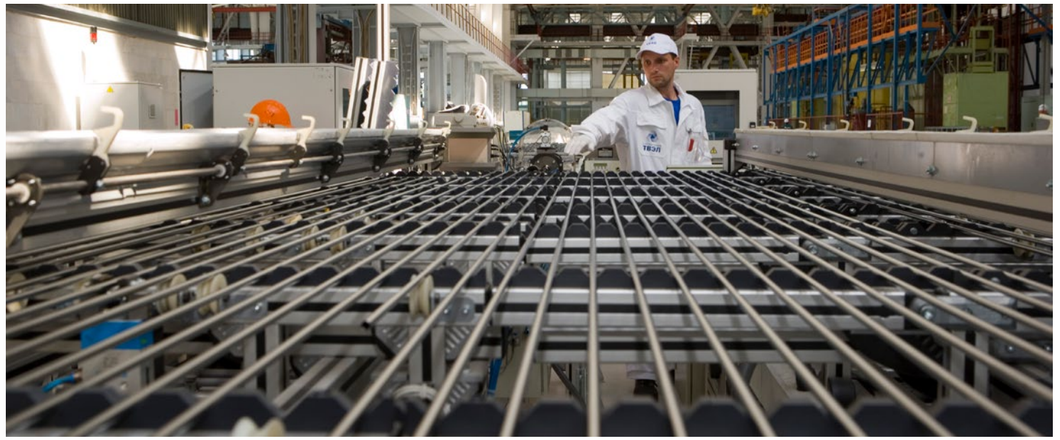


DIAGRAM 23





Based on the survey results, the management of each enterprise develops action plans aimed at increasing and maintaining the level of personnel engagement. Thanks to the work done, the Fuel Company takes top positions in personnel engagement among the industry divisions year on year, being among the "Best Employers of Russia".

MOTIVATION AND REWARD SYSTEM

Incentive and reward policy in TVEL Fuel Company is aimed at maintenance of salary competitiveness. The salary increase and indexation amounted RUB 220 mln in the reporting period.

The average salary level in TVEL Fuel Company (TVEL JSC included) made RUB 82,234, which is 6% higher than in the previous year

Ratio of standard entry level wage of the Company to minimum wage in some regions varies from 1 to 1.3 times (maximum – 1.3 times in Novosibirsk region, minimum 1.0 in Moscow and Sverdlovsk region).

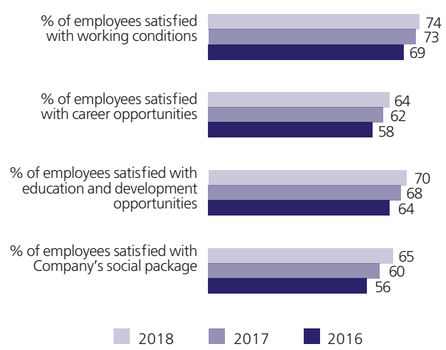
TABLE 26

Personnel Engagement, %

ENTERPRISE	2016	2017	2018
TVEL JSC	85	83	85
Angarsk Electrolysis Chemical Complex (AECC JSC)	96	97	88
Bochvar Institute (VNIINM JSC)	84	85	87
Kovrov Mechanical Plant (KMZ PJSC)	89	90	87
Centrotech SPA LLC	64	80	77
Electrochemical Plant (PA ECP JSC)	91	93	94
Ural Electrochemical Integrated Plant (UEIP JSC)	92	98	97
Siberian Group of Chemical Enterprises (SGChE JSC)	66	82	83
Machine-Building Plant (MSZ PJSC)	80	83	84
Novosibirsk Chemical Concentrates Plant (NCCP PJSC)	85	85	85
Chepetsky Mechanical Plant (ChMP JSC)	67	63	67
On average for considered enterprises	**82**	**83**	**82**

DIAGRAM 24

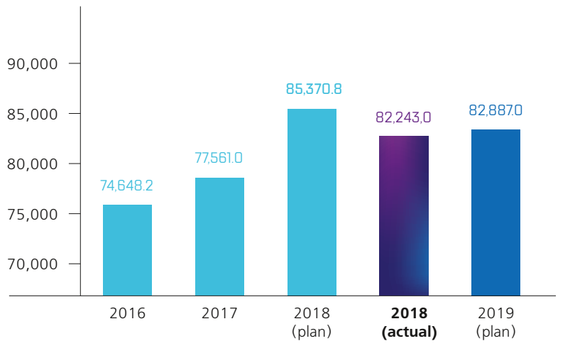
Employee satisfaction, %*



* Exclusive of Industrial Innovations JSC, of Ecoallliance LLC, Iskra LLC.

DIAGRAM 25

Average salary in TVEL FC (TVEL JSC included), RUB



2018 ARRANGEMENTS

- salary indexation at all enterprises of TVEL Fuel Company, except for TVEL JSC;
- increase of targeted annual premium rate in certain subsidiaries (increase by per cent corresponding to salary indexation per cent);
- selective reconsideration of the employees' personal additional incentive following the results of the annual assessment;
- review of remuneration system and benefits efficiency in the Company's enterprises; collection, of the employees' proposals for alteration of salary disclosure documents.

TABLE 27

Ratio of average pay in the subsidiaries of TVEL Fuel Company to average pay in regions of operations*

REGION	2016	2017	2018	Average pay in the region in the reporting year**
Moscow	2.30	2.83	2.03	80,816
Moscow region	1.71	1.94	1.54	49,523
Vladimir region	1.57	1.87	1.75	30,694
Udmurt Republic	1.86	2.16	1.71	31,181
Novosibirsk region	2.26	2.61	2.14	34,523
Sverdlovsk region	2.51	2.77	1.90	36,678
Tomsk region	2.02	2.36	1.93	40,394
Krasnoyarsk territory	2.49	2.68	1.30	43,786
Irkutsk region	2.38	2.74	2.11	41,140

* TVEL JSC included.
** The data of Rosstat as of the beginning of February 2019 are used.

2019 ARRANGEMENTS

- payment of up to 50% of annual premium in advance (in order to increase the employees' social security level due to volatile economic environment and rise in inflation);
- salary indexation in all subsidiaries of TVEL Fuel Company, except for TVEL JSC (scheduled indexation % – not less than consumer price index);
- there might be increase of annual premium rate in certain enterprises (increase by per cent corresponding to salary indexation per cent);
- selective reconsideration of the employees' personal additional incentive following the results of the annual assessment;
- updating of local salary and benefits disclosure documents in order to improve their efficiency (reconsideration of annual premium calculation, approaches to PAI identification following the results of the assessment, etc.);
- elaboration and implementation of measures aimed at increase of variable part of total remuneration depending on personal and collective labor efficiency.

KPI SYSTEM FOR TOP EXECUTIVE MANAGEMENT AND INFERIOR MANAGEMENT

Business performance management system applied by TVEL Fuel Company is based on generating of KPI list ensuring comprehensive development of division for the Company's top management. Maximum preference is given to such spheres as nuclear, radiation, industrial safety and ecology; operational efficiency; increase of nuclear products and industrial operation markets share, where the Company improves its performance by introduction of new products.

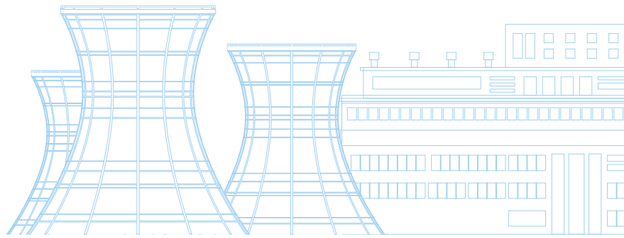


TABLE 28

Examples of KPI for TVEL FC Management

BASIC KPI FOR TVEL JSC TOP MANAGEMENT	BASIC KPI FOR VICE-PRESIDENTS	BASIC KPI FOR DIRECTORS OF SUBSIDIARIES
– Lost time injury frequency rate (LTIFR) and reduction of the severity of injuries at facilities of enterprises, including contractors; – No violations above 2 on the INES scale in the industry; – Labor efficiency; – Integral indicator for foreign orders portfolio; – Integral indicator for new products; – Semi-fixed costs etc.	– Investment activity integrating efficiency indicator; – Sales efficiency; – % of on-time product delivery to FC external customers; – Labor efficiency; – Proceeds from sales and foreign orders portfolio, as well as on new products of the Company etc.	– Investment activity integrating efficiency indicator; – Lost time injury frequency rate (LTIFR) and reduction of the severity of injuries at facilities of enterprises, including contractors; – Labor efficiency; – % of compliance with delivery schedule for internal and external customers; – Number of admitted customer claims and complaints; – Integrated cost index etc.

NON-MATERIAL BENEFITS FOR EMPLOYEES

System of non-material benefits for the employees of TVEL Fuel Company is aimed to encourage professional growth, increase in efficiency and performance, attainment of the goals and the best final results of activities, enhancement of the work quality and arrangement of conditions for creative activity.

Achievements of the employees of the Company are marked with state awards, awards of Rosatom and TVEL JSC in accordance with the Uniform Industry-Specific Award Policy.

During the year 2018 in celebration of commemorative days and anniversaries, about 3 thous. workers and veterans of TVEL Fuel Company received rewards and bonuses for best performance, contribution to development of enterprises of the Fuel Company and nuclear industry, in particular:

- national awards – 5 employees;
- awards of Rosatom State Corporation – more than 1,000 persons, including merit badges – 174 workers and veterans, labor merit badges "Veteran of Nuclear Power and Industry" – 161 persons;
- awards of TVEL JSC – more than 1,000 persons.

DEVELOPMENT OF STAFF CAPACITIES

People are an important asset of the Fuel Company, which provides internal stability and business modernization. Traditionally, HR development and training is one of the top priorities of HR policy of TVEL Fuel Company.

The purpose of HR development program is to support business priorities of Rosatom State Corporation.

Priority development programs at the Company's enterprises:

- Program of Succession Pool Formation and Development: "Rosatom Assets", "Rosatom Assets. Basic Level", "Rosatom Capital" and "Rosatom Talents". The program is aimed at increasing management competencies in accordance with a single value model, as well as involving staff in key sectoral strategic projects and industry tasks.
- The globalization participants development program Global Professionals aimed at client-oriented approach development, readiness for change, innovation and knowledge acquisition according to international standards.
- training program in the field of safety culture aimed at building workers' understanding of general principles of safety culture, developing a leadership position in terms of safety, creating an atmosphere of openness and trust in the team.

PERSONNEL TRAINING

Within HR Development and Training Provisions, the Company's enterprises regularly provide training to enhance competencies of their workers. Amount of investment training in 2018 made RUB 100.6 mln. In the reporting year 8,750 employees of the Fuel Company trained in least one program. Arrangements 2019 provide for nearly 13 thous. trainings.

The decrease in training hours is due to the transition to more intensive and capacious programs using online training.

Educational events, that contribute to development of skills, are implemented using the resources of corporate coaches, as well as the external providers of training services.

TVEL Fuel Company enterprises regularly implement sectoral and divisional training programs to enhance competencies of enterprises management and employees.

DIAGRAM 26

Average training hours per employee

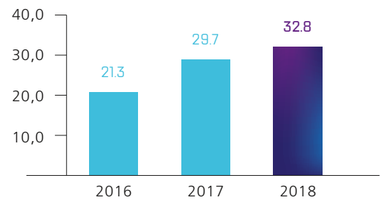


DIAGRAM 27

Average training hours per employee in 2018

PERSONNEL EFFICIENCY ASSESSMENT

The Company has been successfully implementing the RECORD annual personnel performance assessment system the main objective of which is to ensure compliance of professional and technical knowledge and skills level and positions held or planned.

The assessment is carried out to solve the following tasks:

- confirmation of the compliance of the current level of professional and technical knowledge and skills of the assessment participants with the requirements established in accordance with the local regulatory legal acts of the Company;
- database creation concerning the level of professional and technical knowledge and skills of industry employees applying for filling open managerial positions;
- motivation for advanced training and professional growth;
- obtaining information for the development and updating of training and development programs.

The key principles of assessment are objectivity and relevance. Objectivity is achieved by evaluations calibration (alignment of evaluation criteria for employees of different divisions subordinate to one superior manager) by heads of departments and the superior leader at round table. Assessment of corporate values is performed only in relation to the behavioral indicators of the employee associated with his/her professional activities and influencing his/her performance.

Following the results of assessment, the recommendations were made concerning alteration of personal additional incentives, choice of training program and recruitment of employees to succession pool and career planning.

In 2018, 492 employees of TVEL JSC passed the RECORD assessment (96% of the headcount), including 172 women, 320 men. Every year, 14 enterprises of TVEL Fuel Company take part in the RECORD assessment. Based on the assessment outcomes, only 5% of employees had D rating (efficiency level below standard), 67% got C (standard efficiency level), 26% — B (high efficiency level), 3% — A (exceptionally high efficiency level).

DIAGRAM 28

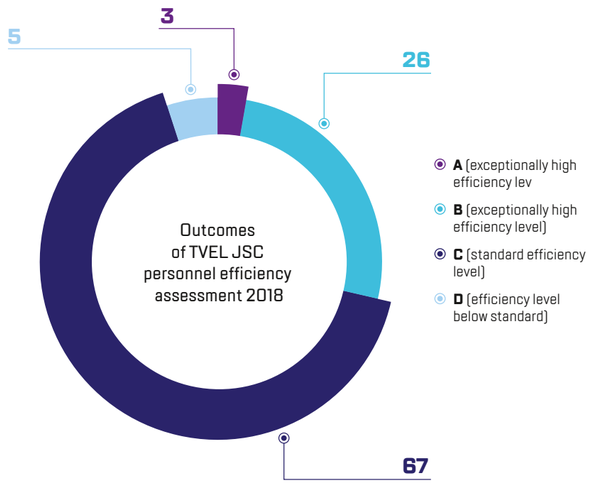


TABLE 29

Corporate educational events

PARAMETER	2016	2017	2018	2019 (plan)
Corporate coaches on improvement, pers. (accrued total)	17	37	37	38
Improvement tools trainings (programs/trainings)	6/522	8/502	10/431	10/301
Process factories	6	7	7 (2 under development)	9
Number of "Improvement weeks"	7	8	5	6

PROFESSIONAL COMPETITIONS

For 10 years TVEL Fuel Company has been holding professional skills competitions, since 2016 they are oriented to WorldSkills standards.

The III industrial Rosatom Championship WorldSkills — AtomSkills 2018 was attended by 450 participants and about 500 experts, the TVEL Fuel Company team consisting of 139 skilled specialists, 69 participants and 70 experts, participated in 20 contests of 27. The team of TVEL Fuel Company won 3 gold, 5 silver and 3 bronze medals.

The Company representatives won a gold and two bronze medals in the WorldSkills Russia Skills of the Wise National Competition for professionals over 50 years of age. Representatives of TVEL Fuel Company won the V National Championship of cross-industry vocational professions WorldSkills Hi-Tech in three nominations and were awarded two gold and one silver medal.

CRITICAL KNOWLEDGE (CK) is the knowledge accumulated by organization in specific subject areas, as well as personal knowledge and experience of employees, obtaining priority depending on the specifics of the organization's activities in a resource-constrained environment.

The Fuel Division has implemented a systematic approach to preservation of critical knowledge based on existing IAEA knowledge management concepts. Within the said approach, knowledge mapping has been carried out with the subsequent formation of a knowledge map. Mapping the knowledge of workers and organizations in general allows to combine individual fragments of knowledge kept in different places and get a general idea of knowledge pattern of the organization and employees possessing certain knowledge. The final product of CK is the detailed program for the conservation of CK developed for organization, including both methods for preserving critical knowledge and skills, as well as measures required to reduce the negative impact from their loss.

In addition, a mentorship program has been implemented in the industry aimed at the transfer of key knowledge and skills, having following objectives:

- ensuring continuity of generations in key technical positions;
- preservation and transfer of key knowledge and skills;
- raising the professional level of employees;
- increasing the level of motivation for young workers' professional development.

PARTNERSHIP WITH EDUCATIONAL INSTITUTIONS

Recruitment of promising young people is one of the top priorities in HR policy of TVEL Fuel Company. By hiring young specialists, the Company intends to preserve and strengthen its position in the sphere of science and advanced technologies in the years ahead.

Cooperation with educational institutions is carried out on the basis of the communication plan on work with universities and graduates; the plan that is being continuously updated on an annual basis.

With a view of occupational guidance for schoolchildren the Company's enterprises organize excursions, meetings with young specialists, information and educational activities.

In 2018, the enterprises of the Company offered practical training to 600 students of higher educational institutions and vocational secondary schools, 38 of them were employed by TVEL Fuel Company. In 2019, the Company expects 500 students to take their practical training.

Over the reporting period the Company employed 81 graduates of the higher educational institutions and vocational secondary schools, 12 of which took target preparation classes for employment by TVEL Fuel Company

TABLE 30

Interaction with vocational secondary schools and universities

PARAMETER	2016	2017	2018	2019 (plan)
Number of students of vocational secondary schools and universities trained at TVEL FC enterprises	559	554	600	527
employed by TVEL FC	**58**	**32**	**38**	**24**
Number of vocational secondary schools and universities graduates employed by TVEL FC	99	83	81	75
number of young specialists employed after graduation from vocational secondary schools and universities, including those who took target training courses	**12**	**17**	**12**	**13**

VOLUNTEERING ACTIVITIES

2018 has been declared the Year of the Volunteer. At all times in the history of human race, people helped the needy voluntarily and free of charge. Volunteering activities are aimed at building a socially responsible society. It is based on altruism, unselfishness, generosity, publicity, humanism, mercy, compassion, compassion and humanity.

Rosatom State Corporation approved an initiative for the development of volunteering in the context of a sustainable development management system building. Corporate volunteering has a great social effect and, besides, it is good both for the employees and for the State Corporation. Employees have the opportunity to improve their professional and interpersonal skills, develop their leadership potential. A company with a corporate volunteering system demonstrates a high level of social responsibility, which contributes to its overall competitiveness, strengthens the employer's brand and helps build more effective interaction with stakeholders.

In 2018, the Change support team (CST) in the nuclear industry was launched, within which the CST on volunteer movement was organized.

TVEL Fuel Company actively joined it and took part in the first environmental retreat of Rosatom State Corporation in Obninsk. Together with the city veterans, representatives of the authorities and students of MEPI, they planted trees as required by the city.

Another initiative was implemented at the end of 2018, "Santa Claus-in-charge". Essentially, employees of TVEL JSC and VNIINM JSC voluntarily initiated and carried out a charity event to support children with disabilities from a boarding school in the town of Vyazniki, the Vladimir region. Caring people of TVEL JSC and VNIINM JSC together with Rusatom Overseas JSC collected more than 200 gifts from a wish-list and sent them to children for a New Year's Day.

The close work with Rosatom State Corporation allowed TVEL Fuel Company to outline the principles of volunteering, understand the importance of such activities and define the directions and the scope of the movement development in 2019. The very first steps proved that actions of the CST KPI of the volunteering movement cover more comprehensive subjects. In this regard, it was decided to expand the geography of sustainable development activities, which was approved and supported by the management of Rosatom State Corporation. TVEL Fuel Company will continuously develop and promote initiative in this sphere at its enterprises.

TOCHMASH VPA JSC AND KMZ PJSC SIGNED A STRATEGIC PARTNERSHIP AGREEMENT WITH TOP UNIVERSITIES OF THE VLADIMIR REGION

In August 2018, a round table was held at the site of Tochmash VPA JSC on the prospects of manpower training for industrial enterprises of TVEL Fuel Company located in the Vladimir region. The meeting resulted in the signing of two strategic partnership agreements between KMZ PJSC and Tochmash VPA JSC, on the one hand, and FSBEI HE Vladimir State University, as well as V.A. Degtyarev KSTA, on the other hand.

Under the agreement, the parties agreed on mutually beneficial cooperation aimed at the development of economic relations, educational, research and innovation and research activities, on training young specialists in the following areas: Instrument Engineering and Information Measuring Technologies, Quality Management, Radio Engineering, Software Engineering, Design and Technology of Machine-Building Production, Technological Machines and Equipment, Mechatronics and Robotics in the period 2019–2023.

For example, TVEL JSC plans to organize a United Donor Day, which will unite non-indifferent people wishing to join a voluntary charity event for blood donation.

Also it plans to continue tree planting in the cities of presence together with Rosatom State Corporation.

Activities sheet is drawn, and organizers will inform about them during the whole calendar year.

YOUTH MOVEMENT

The youth as the most active part of the staff has always been the indicator of changes and driver of the Company's development.

In December 2016 the Fuel Company approved the Concept of the Unified Youth Policy and determined its priorities:

- promotion of the Rosatom strategy and Values, strategic objectives of TVEL Fuel Company;
- strengthening of business reputation of TVEL JSC;
- implementation of social ideology.

The Unified Youth Policy supposes participation of young specialists in historical work, development of corporate science, establishment of new production units in order to provide the flow of workforce into the cities of presence, increase of personnel engagement, in implementation of the strategic initiatives of TVEL JSC "Social Responsibility", "Environmental Responsibility", etc.

Sectoral policy in the field of the youth movement was approved in 2018. Following the results of the Youth Congress, Director for Global Development of TVEL JSC D.A. Bazhenov was elected as Divisional youth representative at TVEL Fuel Company, as well as leaders of the youth core bodies at the Company's enterprises.

In the reporting period, the format of the youth movement activities was reviewed, the 2019 agenda was set, a pool of active participants having their own projects and eager to actively engage in activities was formed.

SOCIAL PROGRAMS

9 Corporate Social Programs implemented by TVEL Fuel Company:

- non-state pension benefits;
- voluntary health insurance;
- accident and sickness insurance;
- assistance in housing programs;
- sanitary and resort treatment and recreation of employees and their children;
- catering;
- assistance to non-working pensioners;
- sports and cultural events;
- benefits to employees in certain circumstances.

In order to provide additional insurance coverage to employees, the Fuel Company and JSC TVEL implemented corporate social programs of voluntary medical insurance and insurance against accidents and diseases. The said programs are implemented in line with the Uniform Industry-Specific Policy of Rosatom State Corporation and its organizations. All operating collective agreements of enterprises have sections dealing with occupational safety and health issues.

DIAGRAM 29

Expenses of TVEL FC on social programs, RUB mln

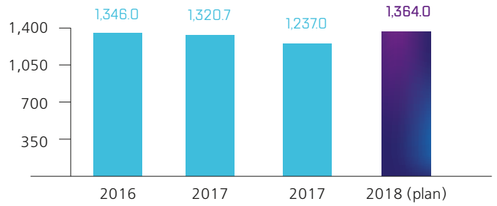
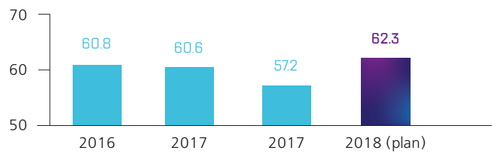


DIAGRAM 30

Expenses of FC TVEL for social programs per employee, RUB thous.



TVEL Fuel Company's social programs represent a strong motivating factor. Total amount spent by the Company on its social programs in 2018 made RUB 1,237 mln, or RUB 57.2 thous. per worker.

TABLE 31

Outcomes of Implementation of Major Corporate Social Programs in 2018

CORPORATE SOCIAL PROGRAM	FUNDS ALLOCATED UNDER THE PROGRAM IN THE REPORTING YEAR, RUB MLN	HIGHLIGHTS BY THE END 2018
Voluntary health insurance (VHI)	192.5	99% of TVEL FC employees are insured under VHI policy*
Accident and sickness insurance	10.2	89% of TVEL FC employees are covered by accident and sickness insurance
Sanitary and resort treatment, recreation of children	151.4	2,851 employees got vouchers to sanitary and rehabilitation resorts in 2018, where 1,729 persons work in harmful conditions, and 1,824 children. Maximal cost of a voucher in 2018 was RUB 56.7 thous. for a 21-days treatment course.
Assistance in improvement of housing conditions	81.6	988 employees have improved their housing conditions under the housing program in 2018, 516 out of them are young specialists up to 35.
Benefits to employees in difficult situations	61.5	The amount of benefit does not depend on the position, the types and criteria of benefits provision are unified.
Sports and cultural events	78.8	The enterprises of TVEL FC held more than 840 corporate, sports and children's events in 2018.
Assistance to non-working pensioners	454.0	There are over 37 thous. non-working pensioners registered in the organizations (personnel service, veterans' council, trade unions) of TVEL Fuel Company. 1,124 non-working pensioners got vouchers to sanitary resorts.
Non-state pension provision	114.0	By the end 2018, 16% of TVEL FC workers were involved in the non-state pension provision program; Pension accruals were accumulated at Atomgarant Non-State Pension Fund.
Total	**1,146.2**	—

* New employees are included in the VHI program after successful completion of probationary period, thus at the moment less than 100% of the employees can be covered by the VHI policy.

INTERACTION WITH TRADE UNIONS

Every employee has the right to join a trade union organization. Primary trade unions function in all enterprises of TVEL Fuel Company. The management of the Company and Rosatom support their employees' membership in trade union organization. Share of employees being the members of trade unions reaches 98% in some subsidiaries.

Within the framework of social partnership development program, the management of TVEL JSC regularly holds quarterly joint meetings with the Russian Trade Union of Nuclear Energy and Industry Workers (RUNPIW) and the chairmen of primary trade union organizations of TVEL Fuel Company. Participants of those meetings discuss the issues related to the activities of TVEL Fuel Company and development prospects. Besides, 2 meetings of working groups were held jointly with RUNPIW in 2018.

OCCUPATIONAL HEALTH & SAFETY

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM

The main directions, directives and commitments in the sphere of health and safety of TVEL Fuel Company's workers are recorded in TVEL JSC Health and Labor Protection Policy.

System-based application of the guiding principles of the Policy, the uniform methodology for the identification and assessment of occupational risks allows the Company to reduce the impact of harmful and hazardous production factors in the workplace, to allocate targeted funds to solve the most important labor protection problems.

Priority goals and objectives aimed at reducing occupational risks make an integral part of the planning process; they are included in Occupational Health and Safety Objective Achievement Program. Goals are updated annually and assume the special assessment and the improvement of working conditions, reducing injuries, increasing awareness and competence to perform job tasks in a safe manner. In 2018 these positions were also a priority.

The enterprises have installed and are continuing to install video systems at hazardous production sites in order to monitor technological processes and prevent injuries.

SCHEME 15

Occupational Health and Safety Management in TVEL Fuel Company

EMPLOYEES SAFETY AND HEALTH ARRANGEMENTS IN 2018

In the reporting period, the Injury Reduction Program was developed and implemented in the companies included in the management system of TVEL Fuel Company, their subsidiaries and contract organizations.

The management of TVEL JSC and its subsidiaries have taken personal obligations in the sphere of security provision and communicated them to employees. Videos "The whole truth about security" were released. Staff incentive mechanisms have been implemented, including the holding of contests The Territory of Safety and Most Caring Person.

Arrangements were made to strengthen safety responsibility for contractors' operation at the sites of enterprises, a standard form of industrial safety agreement (annex to the contract) was refined, and guidelines for interaction with contractors was developed.

Strategic sessions on activities in the field of occupational safety and safety culture were held in 2018 to exchange best practices, develop new approaches to HR management for safety reasons.

To display the rights of an employee, as stipulated by the Labor Code of the Russian Federation, the possibility of using Stop-Cards is implemented in cases when discharge of work-related obligations may be unsafe for an employee.

The Company adheres to principles of Zero Injury concept, including participation in Vision zero business club.

PA ECP JSC automated pre-shift medical examinations. UEIP JSC created simulators for teaching safe methods of working at height and electrical work.

TVEL Fuel Company has introduced the practice of carrying out no-notice trainings on various topics, including those of "personnel action at failure of transmission lines with simultaneous shutting-down of automatic load transfer system", "personnel actions during short circuit at substation" since 2018.

Video systems to monitor technological processes and prevent injuries were installed at hazardous industrial sectors of enterprises. In 2019, it is planned to ensure data entry from monitors on a real-time basis to workstations.

Four comprehensive safety inspections were carried out in the reporting period (including occupational safety inspections) at MSZ PJSC, NCCP JSC, Centrotech LLC, ChMP JSC.

RESULTS 2018

The Company spent grand total* of RUB 2.08 bln or RUB 77.36 thous. per each employee on labor protection arrangements in 2018.

Accident frequency rate (determines the number of casualties per 1,000 of workers) FR in 2018 was 0.19, injuries were recorded only at four enterprises. There were no fatal accidents at TVEL Fuel Company. One accident occurred in the contracting organizations: the fatal case occurred in the contracting organization TuKor LLC at the premises of UEIP JSC (the sufferer was a man), the cause of injury was works organization deficiency.

* Including CFR 3 and CFR 4.

LTIFR ratio of TVEL Fuel Company in 2018 was

0.13** with Rosatom State Corporation's planned ratio no more than **0.3**

** This value is calculated taking into account the accident that occurred in December 2018 and the investigation of which was completed in 2019.

TABLE 32

Dynamics of the Indicators on Occupational Health and Industrial Safety in TVEL FC*

INDICATOR	2016	2017	2018
Average Industrial Injuries Frequency Rate (IIFR)	0.16	0.1	0.19
Injury Rate (IR)	0.02	0.01	0.03
Occupational Disease Rate (ODR)	0.00	0.02	0.00
Absentee Rate (AR)	2.65	2.55	2.27
Lost Day Rate (LDR)	0.40	1.78	0.82

* Presented data on CFR 4. AR 2015 and 2016 was revised due to calculation of planned and not actually spent working time. AFR, ODR and LDR were calculated with coefficient 200,000. LDR was calculated exclusive of fatal accidents.

No emergencies at hazardous facilities occurred during the reporting period.

Each organization of TVEL Fuel Company having hazardous production facilities, implemented measures to ensure industrial safety, which allowed to reduce hazardous chemicals and to lower the hazard class of production facilities.

No violations of safety parameters or limits of the effective and equivalent doses set by the nuclear and radiation safety regulations were registered at the subsidiaries of the Company in 2018.

All production enterprises of the Company operate within the approved effective dose limits applicable to the personnel, no Group A personnel is available (individuals exposed to the effective dose of 100+ mSv and more over a period of 5 successive years, or individuals exposed to annual effective dose of 50+mSv and more).

In 2018, the Department of Nuclear, Radiation, Industrial and Environmental Safety of TVEL JSC together with the Nuclear and Radiation-Hazard Facilities Safety Control Inspectorate of TVEL JSC carried out 17 inspections, including 5 unscheduled inspections by the orders

of the TVEL JSC management. The inspections revealed 636 violations (878 violations were revealed in 2017).

For the purposes of prevention and mitigation of the impact of hazardous and harmful production factors the workers in harmful and hazardous working environments are provided with special and properly certified free clothing, footwear and individual protection means. Average cost of individual protection equipment per each worker exposed to hazardous or harmful working environments in 2018 amounted to RUB 15.56 thous.

In 2018 the enterprises of TVEL Fuel Company:

- did not register any INES events at level 2 and above;
- did not exceed limits of the annual effective radiation doses of the personnel;
- had no Group A personnel exposed to effective radiation dose 100 mSv and above over any successive 5 years

DIAGRAM 31

Structure of Revealed Violations, ea.

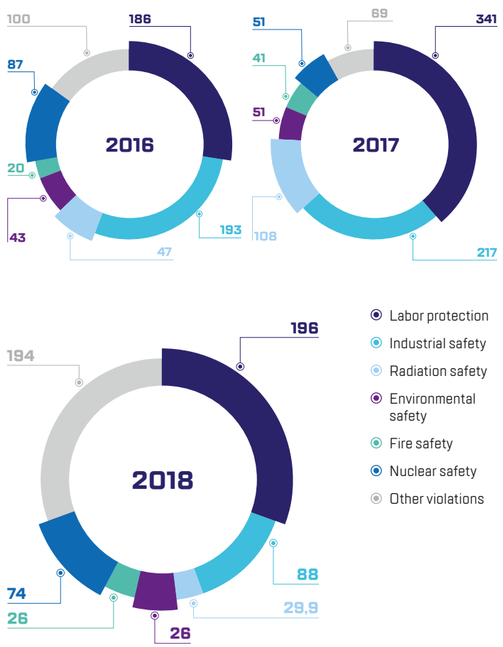
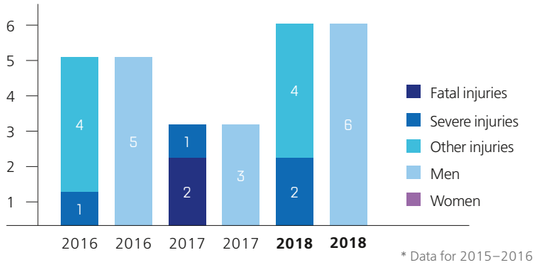


DIAGRAM 32

Industrial injuries at TVEL FC enterprises, pers.*



* Data for 2015–2016 are given for CFR 4.

DIAGRAM 33

Average Annual and Maximum Effective Dose, mSv

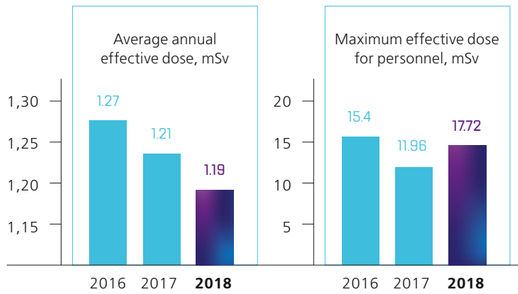
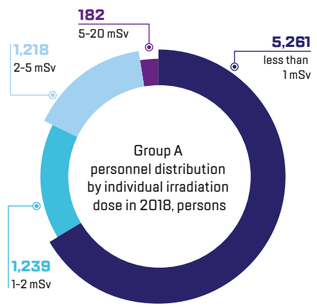


DIAGRAM 34



TVEL Fuel Company won the All-Russian Contest **"Russian Business Leaders": Dynamics and Responsibility –2018"** held by the Russian Union of Industrialists and Entrepreneurs in nomination **"For achievements in the field of occupational safety and health of workers"**

SOCIAL AND REPUTATIONAL CAPITAL

TVEL Fuel Company seeks to organize constructive interaction with stakeholders, ensure social and economic development of the territories of presence and consequently, formation of public acceptance of nuclear industry in general

SOCIAL PARTNERSHIP IN THE TERRITORIES OF PRESENCE

As a reliable supplier of nuclear fuel and uranium enrichment services, TVEL Fuel Company strives to maintain its status and improve its business reputation to foreign customers. Achievement of strategic objectives by the Company directly depends on social and environmental acceptance in the regions and the territories of presence.

The Company developed strategic initiatives and target projects on social and economic development of the regions/territories of presence and ensuring their social stability. The "TVEL JSC Program for Regional Work and Social Projects" is being implemented, systematizing the experience in this area and including three groups of projects:

- formation and preservation of social accord environment in the territories of presence of TVEL Fuel Company;
- cooperation with local and regional public authorities with respect to the concept of the territories' development, the growth of regional taxes and maintenance of social and economic stability;
- enhancement of social programs efficiency and social partnership development.

AGREEMENTS ON COOPERATION WITH THE REGIONS OF PRESENCE

TVEL Fuel Company applies cooperation agreements with the regions of its presence as the main mechanism for supporting cities of presence.

In 2012 TVEL JSC initiated the drawing up and signing of Agreements on Cooperation between Rosatom and public authorities of the territorial entities of the Russian Federation. The agreements provide for comprehensive activities aimed at social and economic development of the regions and cities of presence of TVEL Fuel Company.

Presently there are agreements between Rosatom State Corporation and Sverdlovsk region, Irkutsk region, Tomsk region, Krasnoyarsk territory and the Udmurt Republic.

Annually local government bodies, regional government agencies and TVEL JSC develop and implement joint program of social and economic development of cities of presence of the Company's enterprises within the scope of signed agreements.

900 RUB mln
were directed to the budgets of the cities of presence of TVEL Fuel Company enterprises in the framework of Cooperation Agreements implementation

TABLE 33

Financing of the Program for Social and Economic Development of the Cities of TVEL Fuel Company's Presence, 2018

CITY	SCOPE OF FINANCE, RUB MLN	EVENTS
Sverdlovsk region (CATU Novouralsk)	300.0	– construction of two houses, an exhibition and marketing center, a gym and a school canteen in the village of Tarsakovo, an open ice hockey rink – repair of a stadium of gymnasium No. 41, Novouralsky community center and other social facilities – funding of a sports and recreation complex and a sports base construction – improvement of the Bunarka river bed along the Military Fame Lane in Novouralsk – survey and design of dwelling houses in Pochunok village
Krasnoyarsk territory (CATU Zelenogorsk)	32.3*	– improvement of the Kan river embankment – repair of city roads – purchase of buses – creation of agricultural products center on the basis of Iskra LLC
The Udmurt Republic (Glazov)	496.4	– overhaul of schools and preschool institutions, installation of fences around schools – design work to overhaul the Rossia community center – building a new cemetery – support of sports clubs and city institutions, repair of the city road network
Irkutsk region (Angarsk)	71.2	– construction of a school
TOTAL	**899.9**	

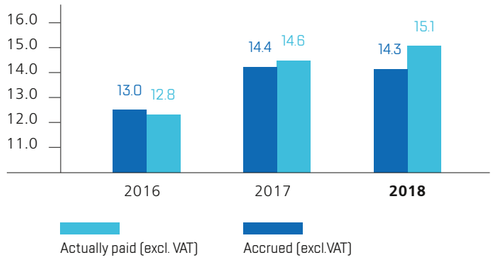
* Funding in the framework of the priority project.

TVEL Fuel Company is a major taxpayer in the budgets of various regions of the Russian Federation. Gross tax liabilities (actually paid) made RUB 15,1 bln in 2018 (RUB 14,6 bln in 2017).*

Regional work unit of TVEL JSC continuously monitors the share of enterprise employees in the urban population.

DIAGRAM 35

Gross tax liabilities of TVEL Fuel Company, RUB bln



* The following taxes and contributions are accepted for calculation by organizations included in the Report outline:
• tax on profits paid by both organizations affiliated to the tax consolidated group and organizations that are not included in the tax consolidated group;
• insurance contributions to extrabudgetary funds;
• other taxes, fees and charges included in the expenses or the cost of non-current assets (corporate property tax, land tax, state fees, etc.).
The amount of VAT payable in 2016 amounted to RUB 6.1 bln, in 2017 – RUB 5.9 bln, in 2018 – RUB 7.2 bln.
Total tax payments paid (including VAT payable to the budget) in 2016 amounted to RUB 19.0 bln, in 2017 – RUB 20.5 bln, in 2018 – RUB 22.3 bln.

TABLE 34

Working-age population employed by subsidiaries of TVEL Fuel Company

CITY	REGION	% OF WORKING-AGE POPULATION EMPLOYED BY ENTERPRISES OF TVEL FC
Angarsk (AECC JSC and subsidiaries)	Irkutsk region	0.77
Vladimir (Tochmash VPA JSC and subsidiaries)	Vladimir region	0.54
Kovrov (KMZ JSC and subsidiaries)	Vladimir region	2.33
Glazov (ChMP JSC and subsidiaries)	Udmurt Republic	7.74
Zelenogorsk (PA ECP JSC and subsidiaries)	Krasnoyarsk territory	8.31
Novouralsk (UEIP JSC and subsidiaries)	Sverdlovsk region	7.98
Seversk (SGChE JSC and subsidiaries)	Tomsk region	6.48
Elektrostal (MSZ JSC and subsidiaries)	Moscow region	4.52

TASED CREATION

Creation of territories of advanced development is one of the cities development directions.

Establishment of TASED in CATU is aimed at creation of new jobs, increase of investment attractiveness of CATU and level of development as compared to the average level of social and economic development of the entities of the Russian Federation.

Rosatom State Corporation and TVEL Fuel Company have been actively and systematically working in this direction since 2014: from the development of comprehensive development programs and their coordination, first by regional authorities, and then by the Ministry of Economic Development and the Ministry of Finance of the Russian Federation, the preparation and implementation of a plan for preventive measures, formation of TASED Managing company, to the release of Russian Federation Government Regulations and registration of the first residents.

In 2018, draft resolutions of the Government of the Russian Federation on the establishment of the TASED in CATU Novouralsk, Seversk and Glazov were approved by federal authorities and sent for signing by the Government of the Russian Federation. Application for establishment of TASED in CATU Zelenogorsk was approved by the government of the Krasnoyarsk Territory, Rosatom State Corporation, the Governor of the Krasnoyarsk Territory and sent to the Ministry of economic development of the Russian Federation.

To attract residents to TASED / industrial parks of the territories of presence of TVEL Fuel Company, as well as to identify and develop joint business projects of the second business core, to organize cooperative relations, a working group was established by the order of TVEL JSC to interact with regional authorities, business and scientific communities.

In the furtherance of strategic goal on non-nuclear businesses development, the work started in 2018 on the selection

TASED (territory of the advanced social and economic development) — is the part of a territorial entity of the Russian Federation with the special legal regime for entrepreneurial and other activities

of technological, commercial, scientific, educational and other partners outside TVEL JSC in the regions of the Company presence.

This activity has become a new direction for TVEL JSC. Interaction with regional authorities, business and scientific communities was carried out aimed at identification and development of joint business projects of the second core, establishment of cooperation, attraction of residents to TASED, industrial parks and clusters.

A series of meetings were held during 2018 in conjunction with the Vice President's Unit for Strategic Development and Marketing with government representatives to identify possible points of cooperation, they took part in strategic sessions and start-up tours with the participation of regional leaders, industrial and scientific enterprises. Following this activity, agreements and 5 roadmaps for business partnership development were signed (2 maps with the Irkutsk region, 1 map with the Novosibirsk, Vladimir regions and the Udmurt Republic).

The presentations of the Fuel Company informed the representatives of regional scientific and industrial complexes about the existing and potential competencies of TVEL JSC, as well as other divisions of Rosatom State Corporation, and to identify specific mutually beneficial projects.

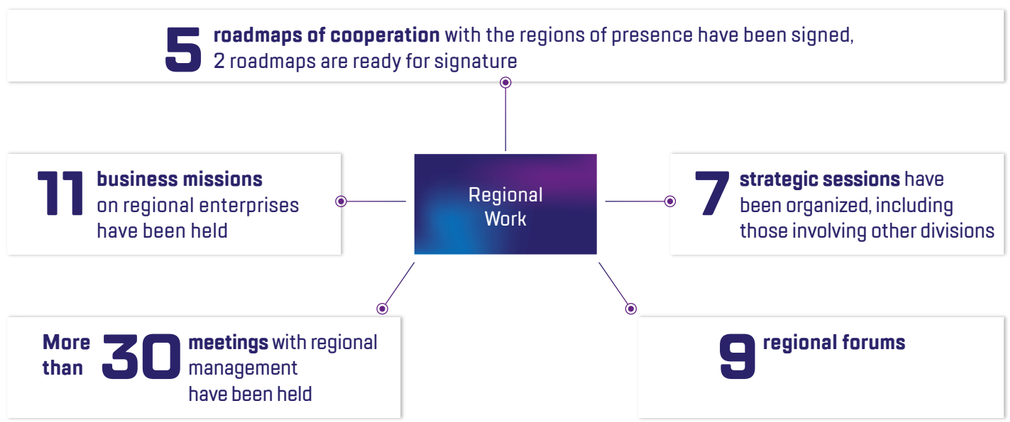
During the Russian Investment Forum held in Sochi on February 15-16, 2018, the President of TVEL JSC N.V. Nikipelova met with authorities of the Vladimir, Sverdlovsk, Tomsk, Irkutsk, Novosibirsk regions, the Krasnoyarsk Territory, the Udmurt Republic on the development of cooperation and interaction. They signed an Agreement with the Government of the Irkutsk region on cooperation and interaction in establishment and development of an industrial park at AECC JSC industrial site.

AECC JSC can offer for lease more than 20 thousand square meters of free production capacities in a protected area with engineering and logistics infrastructure. The site has considerable reserve energy resources (electricity, heat supply, water supply), wherein industrial facilities of 1 and 3 hazard classes are allowed at the territory.

AECC JSC has already received for consideration the first offers from potential investors and residents on the placement of new production facilities at industrial site

In February 2019, Seversk, Novouralsk and Glazov got the TASED status. About 3 thous. jobs will be created there in the nearest three years

TVEL Fuel Company is a pioneer and industry leader in working with regions to develop new businesses



PRELIMINARY RESULTS OF ROADMAPS IMPLEMENTATION

215 assignments in **7** roadmaps

77 partners in regions

6 potential residents of TASED

26 prospective projects (additive technologies, energy storage units, oil and gas service, metallurgical industry, chemistry

Engagement of other Rosatom divisions

COMPLAINTS AND APPEALS HANDLING

Complaints and appeals handling is performed in conformity with the Federal Law "On the procedure of handling appeals filed by citizens of the Russian Federation" No. 59-FZ d/d May 2, 2006. Feedback is mandatory, all appeals and responses are recorded.

Appeals are lodged directly to TVEL JSC, and received from the Rosatom hotline and from the state authorities.

To establish direct communication "Employee-President of TVEL JSC", the so called "post boxes" were installed in all subsidiaries of the Company, thus any employee may address the top management of TVEL Fuel Company confidentially. Besides, one can address directly the President of TVEL JSC on Company's official website or intercorporate intranet portal.

TVEL JSC is a member of All-Russian Industrial Association of Employers "Association of the Employers of the Nuclear Industry, Energy and Science of Russia", and National Association of Procurement Institutes (NAPI)

FORMATION OF SOCIAL ACCORD ENVIRONMENT

TVEL Fuel Company's contribution to social and economic development of territories of presence implies both participation in the regional and local budgets income base, and realization of comprehensive social and charity programs.

Social projects are main support activities in the cities of presence: initiatives implemented through the provision of free and charitable assistance. This assistance is aimed at social support and forms a social accord environment in the cities.

Since 2012 the Charity Council has been working within TVEL JSC; its functions include the determining of purposes and priority areas of charitable activity, approval of the budget and charity events, efficiency assessment of the charitable activity of TVEL FC, etc. 28 meetings of the Council were held in 2018, recorded in the minutes.

Within the budget, TVEL Fuel Company implements scheduled gratuitous initiatives, unscheduled and competitive. In 2018, the Company spent RUB 75 mln on scheduled initiatives, RUB 95.8 mln on unscheduled initiatives, and RUB 14.6 mln on competitive ones. The total amount of expenses for the provision of gratuitous assistance amounted to 184.6 million rubles.

Traditionally, the main areas of gratuitous assistance in TVEL Fuel Company are assistance to education, development of culture, sports and health care.

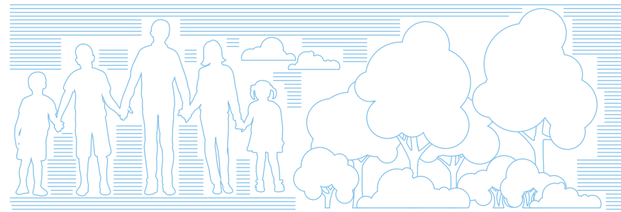
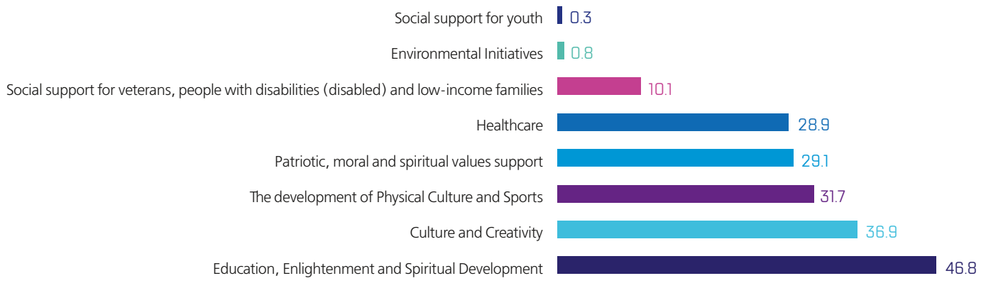


DIAGRAM 36

Funds allocated for charity and social projects in 2018, %



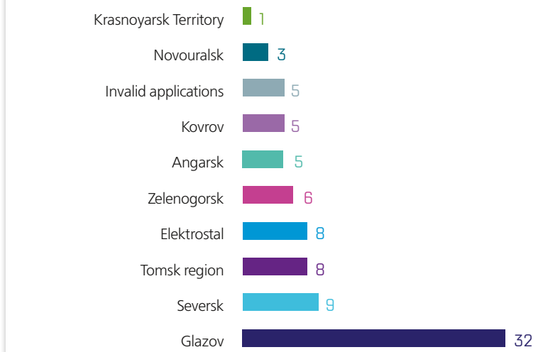
In 2018, TVEL Fuel Company began to introduce new approaches to improve the efficiency of charitable activities. In a number of initiatives, cash savings have been achieved. For example, implementation of the Lean Polyclinic project allowed to save RUB 0.8 mln from the budget of TVEL JSC (with preservation of the project effectiveness).

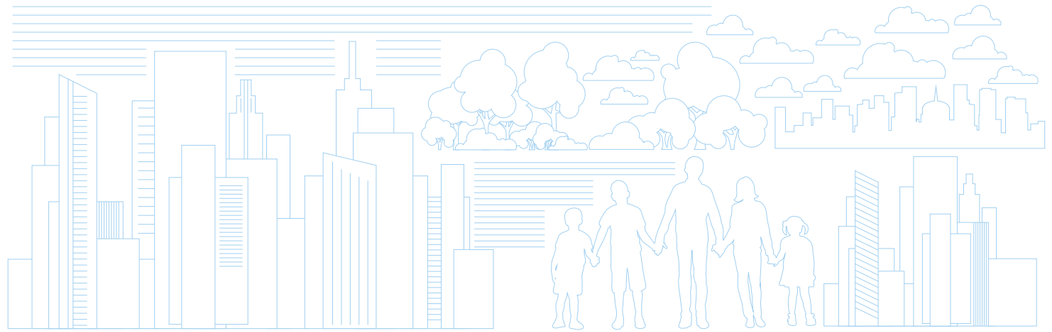
In autumn 2018, social projects contest was launched by TVEL JSC, 82 applications from non-profit organizations were received and processed. The most active were non-profit organizations of the city of Glazov, they filed 32 applications.

In 2019, RUB 12 mln will be allocated from the TVEL JSC budget for the provision of gratuitous assistance to finance the winning projects.

DIAGRAM 37

Distribution of applications to social projects contest in the territories of presence, it.





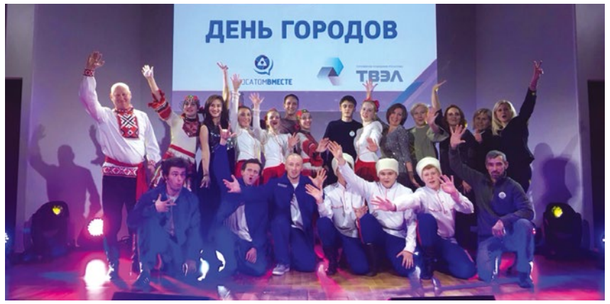
#ROSATOMVMESTE (#ROSATOMTOGETHER)

#RosatomVMESTE contest was held in 2018 in 20 "atomic" cities as a sectoral framework for ongoing social projects.

Alexey Likhachev, Director General of Rosatom State Corporation:

"The production agenda of Rosatom is inextricably linked to the standard of living in our cities. You can not talk about production breakthroughs, if the territory does not develop. We wish to direct our strength and energy towards the development of social sphere, towards the development of life in the cities of the atomic industry. #RosatomVMESTE, on the one hand, is aimed at consolidating and strengthening the already existing projects of the State Corporation, our traditional activities: working with children and veterans, talented young people and large families. On the other hand, the project acquired a new quality, involving implementation of the word "together": the cities could tell about themselves, their achievements and successes, learn more about each other, make new useful contacts, exchange experience and best practices."

TVEL Fuel Company was represented by CATU Seversk, CATU Zelenogorsk, CATU Novouralsk, Glazov. Contest projects are aimed at promoting the development of health care, culture, education, urban environment improvement.



Outcomes of the #RosatomVMESTE contest of TVEL Fuel Company

SOCIAL PROJECTS CONTEST OF ROSATOM STATE CORPORATION IN THE CITIES OF PRESENCE	
Online voting of cities people and experts for the best social project	Following the voting, Udomlya, CATU Seversk, Glazov became the winners
SOCIAL PROJECT COORDINATORS PROJECT	
Selection of best Social project coordinators	6 of 13 candidates CV submitted for contest, cities of FC
BEST MONTH'S CAMPAIGN OF ROSATOM STATE CORPORATION	
City-scale activities on presentation of social projects	185 events have been held involving more than 115 thous. persons
CITY DAY IN ROSATOM STATE CORPORATION	
Presentation of city achievements and success	The stands presented unique Urals icon workshop from Novouralsk, zirconium produce from Glazov, taxidermy exhibits from Seversk museum displaying the diversity of Siberian wild life. Each participating city delivered a vivid presentation, city managers told about significant moments of cities history, achievements in culture, sports, education etc. The culmination of TVEL City Day was a show of amateur and professional artists

A solemn ceremony of awarding the winners of the large-scale project #RosatomVMESTE took place on December 24, 2018 in Moscow, in the hall of the Zaryadye Park Media Center. In addition to commemorative diplomas, the heads of four cities, Glazov, Seversk, Novouralsk and Zelenogorsk, hosting the enterprises of TVEL Fuel Company received certificates from TVEL JSC to the amount of RUB 3 mln each. Certificates were handed over by Natalia Nikipelova, President of TVEL JSC, who noted that more than 180 social events were organized in the cities in the framework of the contest, attended by nearly 120,000 residents. She thanked the city leaders for their involvement and enthusiasm and expressed confidence that the funds allocated will be used to support new interesting relevant projects.

SMALL–MIDSIZED BUSINESS SUPPORT AND DEVELOPMENT

Creation of new jobs and promotion of business environment in the cities of presence are priority directions of charitable activities for TVEL Fuel Company for the last five years.

For example, "Businessman of the Year" contests are held annually sponsored by TVEL Fuel Company to encourage the most effectively developing small and midsized business entities.

In 2013, the Entrepreneurial Development and Supporting Funds were organized in the territories of the Company's presence in terms of co-funding with local authorities and government bodies of the RF constituent entities. The Funds issue loans, grants and subsidies to small and medium-sized business entities (SMBs) for the creation of new jobs, the development of new industries, participation in exhibitions and fairs and business missions.

Due to funds' activities more than 1.8 thous. jobs were created in 2013–2018 in Glazov, CATU Zelenogorsk, Novouralsk, Seversk.

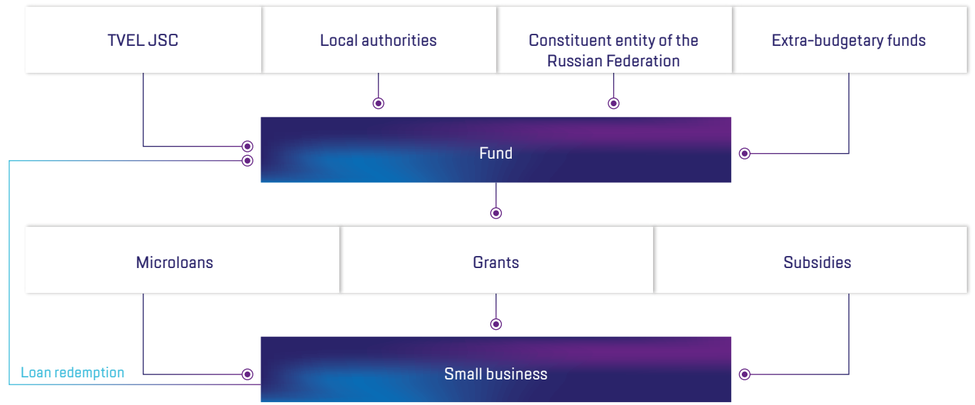
TABLE 35

Performance of Entrepreneurship Development Funds in 2013–2018

CITY	NUMBER OF SMBS PROJECTS THAT RECEIVED FINANCIAL SUPPORT	NUMBER OF CREATED JOBS
Glazov	332	620
Zelenogorsk	22	145
Novouralsk	252	815 (including self-employed)
Seversk	92	269
TOTAL:	**698**	**1,849**

SCHEME 16

Operating pattern of Entrepreneurship Support and Development Funds



SUPPORT OF EDUCATION

AtomClasses

TVEL Fuel Company sponsors so called "AtomClasses", operating in the cities of the Company's presence (Angarsk, Glazov, Zelenogorsk, Kovrov, Novouralsk, Seversk, Elektrostal). The AtomClasses are specialized classes in best schools of the cities with advanced teaching of physics and mathematics. The specific feature of such classes is the profound study of nuclear physics and nuclear technologies.

The important part of the project is procurement of the advanced laboratory equipment for teachers to demonstrate innovative physical presentations, and for students of AtomClasses to have their training laboratory courses and to carry out research works. Such advanced training will help the students to succeed at academic competitions, contests, school children's academic achievements festivals. Further on, the AtomClasses graduates will be able to continue their education in relevant technical universities.

School Technoparks

School Technopark network project is one the most important ones among educational projects. It is an educational environment that allows to integrate education, science and production resources to create conditions for innovative educational activities and is a network of laboratories

1,628 students of school technoparks took part in scientific and technical competitions

521 of them became winners and prize-winners

created in 2016–2017 based on 4 schools of CATU Seversk, Novouralsk Lyceum No. 58, Glazov Physics and Mathematics Lyceum as well as 9 schools in CATU Zelenogorsk supported by TVEL Fuel Company.

The laboratories have modern high-tech equipment, the unity of the educational space is provided by programs in various areas: environmental monitoring, robotics and intelligent systems, 3D modeling and prototyping, chemical and biological research, lego-design, programmable material processing methods, chemical analysis, etc.

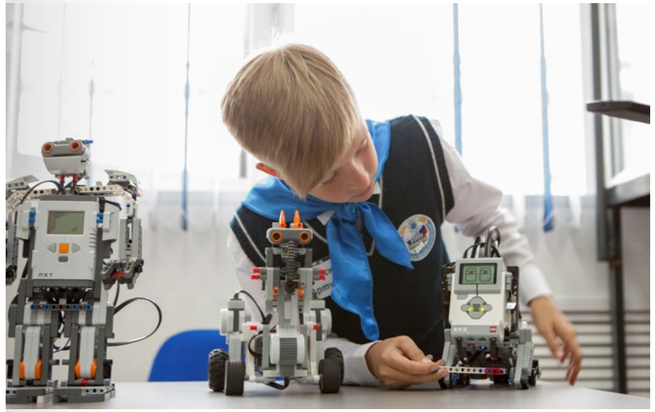
In 2018, 3 new laboratories were opened: a programming laboratory at the Glazov Physics and Mathematics Lyceum, a composite materials laboratory at the Novouralsk Lyceum No. 58 and an aerodesign and drones programming laboratory at the Lyceum No. 174 in Zelenogorsk. In total there are 28 laboratories.

Under the project, 68 scientific and technical educational programs are implemented in educational institutions of the cities of Glazov, Zelenogorsk, Novouralsk, Seversk involving in total 3,234 persons a year.

Another important stage in project implementation is cooperation with universities. At the moment, the network interaction format has been developed with Seversky Institute of Technology of MEPhI NRNU, RI TSU, FSBEI HE Tomsk State University of Control Systems and Radioelectronics in Seversk, with Izhevsk State Technical University in Glazov and Novouralsk technological Institute of MEPhI NRNU in Novouralsk. Representatives of universities act as managers and experts of students' design and research work carried out in laboratories.

Special attention is paid to schoolchildren technical activities within the project. Municipal contests of design works in robotics and computer simulation were held in 2018 for the second time, 19 winners were selected.

Contests are aimed at stimulation of professional interest in engineering specialties among the younger generation,



The laboratories work both during the school year and during the vacation time. For example, Seversk Physics and Mathematics Lyceum has specialized summer sessions in robotics held for 3 years for students of 4–6 classes

selection of gifted young people and supporting them in solving scientific and technical engineering problems in the field of innovative technologies, modeling, designing, as well as developing engineering and technical skills in students, promotion of computer modeling additionally to class hours.

In 2018, cooperation with the Kurchatov Institute Research and Development Center was initiated in the main areas: methodological support, examination of School Technopark projects, and development of educational programs. We are looking ahead to sign in 2019 a cooperation roadmap and agreements between School Technoparks and the RDC.

On September 25-26, 2018, Interregional Stage of the School Technopark Projects Competition was held under the auspices of the 5th International Forum NDExpo 2018 — High Technologies for Sustainable Development, where the winners of municipal stages of contests presented their projects. Contests were held on the territory of the Skolkovo Technopark. 19 participants presented 16 projects.

There were 3 nominations: "The most commercially elaborated project", "The most innovative project", "The most original project". Finally, 3 winning projects were selected:

- "Electronic sports scoreboard", Glazov;
- "The program for training employees of SGChE JSC using virtual reality technology", CATU Seversk;
- "Prototype of a scaled-down assembly model of KamAZ truck", Zelenogorsk

HEALTH MAINTENANCE

In the sphere of health, TVEL JSC assists in improving the efficiency of medical institutions, improving living conditions of medical workers, acquisition of modern equipment and support of health facilities in the cities of presence.

The children's clinics support is priority direction 2019

TABLE 36

Key indicators of the School Technopark project in 2017–2018

	Seversk	Zelenogorsk	Novouralsk	Glazov	TOTAL
Number of school technopark laboratories in the city	5	4	15	4	**28**
Number of city secondary school students with access to school technopark infrastructure, pers.	1,576	808	150	700	**3,234**
Share of city secondary school students with access to school technopark infrastructure, %.	14.5	12.9	2.0	6.8	—
The number of design works created by students on the basis of school technoparks.	99	43	25	18	**185**
Number of technical educational programs.	17	27	9	15	**68**
Number of participants / prize winners of scientific and technical events (Olympiads, contests), pers.	599/109	470/189	174/91	385/132	**1,628/521**

Lean Polyclinic

Lean Polyclinic is a key healthcare project. The project is aimed at enhancement of operating efficiency of medical and preventive institutions and the level of access to health care for the population of Glazov, Zelenogorsk, Novouralsk, Seversk.

Within the project, TVEL JSC allocated RUB 4.7 mln to the Federal State Budgetary Healthcare Institution "Central Medical Unit No. 31 of the Federal Medical and Biological Agency of Russia in Novouralsk" (children's clinic). Due to the measures taken, the time spent by patients at the registry reduced almost twice and has become a third less in general; the time for preventive medical examinations of children reduced twice.

In Glazov, the project was implemented in Glazov Interdistrict Hospital and the Central Medical Unit No. 41 of the Federal Medical and Biological Agency of Russia of Glazov.

In adult polyclinic No. 2 of the Glazov Interdistrict Hospital, the time for preventive medical examination reduced by 40 times, the visit to the X-ray room reduced twice, 3-fold reduction of time spent in treatment room. In children's polyclinic No. 3, 12-fold reduction of an appointment receipt time at the reception, the time for passing medical examination of children under 1 year reduced from 72 hours to 3.5 hours.

Central Medical Unit No. 41 received RUB 4.8 mln from TVEL JSC for project implementation in 2018. 2-fold reduction of the time for specialized doctors appointment. 3-fold reduction of blood sampling time, 2-fold for functional diagnostics time (from 1,320 to 660 seconds).

In Zelenogorsk, the main project participant was Clinical Hospital No. 42 of the Federal State Budgetary Healthcare Institution Federal Siberian Clinical Center of the Federal Medical and Biological Agency of Russia PA ECP JSC allocated about RUB 8 mln to relevant activities. In adult clinic, 3-fold reduction of prescription time. In children's polyclinic, the waiting time for receiving a medical service when visiting a pediatrician and specialized doctors was reduced from 90 to 40 minutes, 4-fold reduction of the waiting time in registry office, the time spent by patients to receive information services in the registry reduced from 10 to 3–5 minutes.

In adult polyclinic of Consultative and diagnostic center No.1 of Federal State Budgetary Healthcare Institution Siberian Federal Scientific and Clinical Center in Seversk, 2-fold reduction of the time of medical examination and blood sampling. In children's polyclinic, the number of appointments through the registry reduced from 60% to 40%, and the number of online appointments increased to 30%. TVEL JSC allocated the Federal State Budgetary Healthcare Institution Siberian Federal Scientific and Clinical Center RUB 4,7 mln in 2018. The main project activities will be completed in 2019.

Electronic work incapacity certificate service has been introduced by the Federal State Budgetary Healthcare Institution Siberian District Medical Center of the Federal Medical and Biological Agency of Russia in Novosibirsk, 5-fold reduction of time for service obtaining.

In State Budgetary Healthcare Institution Clinical City Hospital No. 2 Polyclinic for adults No. 4 of the city of Kovrov, the time for passing a medical commission and drawing a sanatorium and health resort card form has become a one-third less. The time of the patient's primary visit to a therapist reduced by 20%, the number of online appointments increased twice (from 5 to 10%).

Since 2017, TVEL JSC together with Rosatom State Corporation and the Ministry of Health of the Russian Federation has been participating in implementation of a large-scale project Lean Polyclinic.

The main tasks of the project are to reformat the logistics of medical facilities' processes, both for adults and children, to optimize the work at front desks and to shorten the patient's polyclinic time

LEAN CITY

Lean City project launched in 2018, before that it was implemented in 2 pilot cities: Glazov and Novouralsk.

3-4-fold reduction of the time for managerial decisions making and meetings holding in Glazov Gymnasium No. 14. 18 fold reduction of time for detection of failed utility consumption meters at Municipal Unitary Enterprise Housing and Utilities Directorate, and 2-fold reduction of labor input. **The potential economic effect for the city is estimated at RUB 193 mln.**

A project on optimization of laboratory monitoring of drinking water quality was implemented at MUE Vodokanal municipal unitary enterprise in Novouralsk. The sampling time of drinking water was reduced by a quarter, which makes it possible to assess quality of drinking water in the city more quickly and efficiently.

STAKEHOLDER ENGAGEMENT

TVEL FC always applies the principles of transparency*, and constantly interacts with stakeholders, systematizes, analyses and takes into consideration their requests. This approach allows to respond quickly to potential risks related with stakeholders relations, in particular with those of social and reputation nature.

System of relationships with each group of stakeholders influences and will influence the operations of TVEL Fuel Company, that's why due consideration of their interests in planning and in the course of daily operations is the most important condition of sustainable development. Analysis of the key events, major financial and production outcomes and the Company's performance in the sphere of sustainable development demonstrates that social capital is among the major sources of business stability.

* With regards to objective restrictions of the nuclear industry.

Stakeholders engagement events during the preparation of the 2018 Report

While preparing the Public Annual Report (hereinafter referred to as "the Report") the principles of Standard AA1000APS were adhered to, in particular, the compliance of the information published with the requests of stakeholders involved was ensured. Two dialogues with stakeholders (live and off-site dialogues) were conducted to implement this principle, as well as public consultations on draft Report.

Participants of these dialogues were the representatives of Rosatom State Corporation, industry partner organizations, subsidiaries, environmental, public, trade union organizations, higher educational institutions, local governmental authorities, mass media, consultants and auditors.

In December 2018 TVEL JSC organized an off-site dialogue on the concept of Annual Report 2018. The Report concept developed by the Company with account of the proposals of stakeholders committee was presented; the participants gave recommendations which allowed to finalize and refine the concept of the Report.

In the course of the dialogue held on February 16, 2018, the matters of preparation of TVEL JSC Public Annual Report 2018 have been discussed, some outcomes 2018 have been summarized, priority issues to be disclosed in the Report have been stated: **New Businesses and Products of TVEL Fuel Company of Rosatom**.

The draft annual report of TVEL JSC 2018 prepared subject to the comments made by stakeholders in the course of the dialogues was presented during the public consultations on April 29, 2019. Following the events, proposals were made by stakeholders on information disclosure in the Report.

The table specifying the stakeholders' comments is given in an interactive version of the Report. The minutes of the dialogues are available at:
http://tvel.ru/wps/wcm/connect/tvel/tvelsite/finance/annual_report/dialog/

During the preparation of this Report, rank chart of stakeholders was updates: the influence of TVEL Fuel Company activities on stakeholders was assessed and the influence of stakeholders on the Company.

ANNUAL REPORT 2017 AWARDS

TVEL JSC won the traditional contest of annual reports of "Expert RA" agency (RAEX) in nomination "The best disclosure of information on sustainable development activities in the annual report".

Efficiency improvement and sustainable development were identified as the priority themes of the JSC Annual Report 2017. Special attention in the text of the report was paid to projects in the field of operational efficiency, as well as environmental protection issues, corporate social responsibility, the contribution of TVEL JSC and the Fuel Company enterprises to social and economic development of the regions of presence.

A total of 95 reports participated in the rating. All reports were divided into five levels: top quality — "5 stars", very high quality — "4 stars", high quality — "3 stars", acceptable quality — "2 stars", satisfactory quality — "1 star". **The TVEL JSC annual report was awarded the highest 5 stars rating.**

Besides, UEIP JSC annual report was awarded the 4 stars rating.

DIAGRAM 38

Fuel Company's Stakeholders Rank Chart

NATURAL CAPITAL

Environmental acceptability remains the strategic priority of TVEL Fuel Company. With knowledge that production activities have an impact on the environment, the Company, due to its industry specificity, implements a set of measures aimed at reduction of the environmental impact by the enterprises connected with current business tasks, and removal of the environmental "heritage" of the first nuclear project

ECOLOGICAL POLICY

TVEL Fuel Company regularly takes part in national and regional environmental events, proving high social responsibility in environment protection and preservation of the country's natural wealth. The Company works consistently on reduction of adverse environmental effects of its operation.

The main environmental goal of TVEL Fuel Company is promotion of ecological, nuclear and radiation safety, implementation of the Company's strategic objective to provide social and ecological suitability.

TVEL Fuel Company maintains the Integrated Management System, where a Corporate Environmental Management System is a constituent.

System-based application of the guiding principles of Ecological Policy, the unified methodology of environmental aspect identification and environmental risks and opportunities evaluation allows to allocate funds to solve the most important problems, thus improving performance in the field of ecology. Priority goals and objectives aimed at reducing environmental risks are an integral part of the planning process; they are included in TVEL Fuel Company's Environmental Objective Achievement Program and Ecological Policy Implementation Plan.

TVEL Fuel Company activity aimed at reduction of adverse environmental impact of the enterprises is characterized by branch specificity and carried out in two directions:

- Removal of the environmental "heritage" of the first nuclear project, created as a result of execution of the military state programs on enterprises included into the management system of the Company, which implies execution of large scale works connected with decommissioning of the nuclear industry facilities and rehabilitation of the contaminated territories.
- Reduction of the impact by the enterprises on the environment connected with current production operations. Ecological management system in being developed in this direction with implementation of modern resource saving production technologies, routine environmental protection actions and continuous environmental quality monitoring.

In accordance with the above directions, enterprises of TVEL Fuel Company formulate annual plans of environment protection measures.

The enterprises of TVEL Fuel Company make regular efforts to improve the existing and introduce the advanced environmental technologies and technologies for monitoring adverse impact on the environment, staff and population of the regions of the enterprises' presence. Special attention is paid to environmental safety during improvement of the existing nuclear fuel production technologies.

Employees of TVEL JSC and its subsidiaries take an active part in the development of scientific and technical reference books

on the best available technologies; these reference book are used at the enterprises included into the management system of TVEL Fuel Company.

Environmentally important subsidiaries of TVEL Fuel Company (AECC JSC, PA ECP JSC, SGChE JSC, NCCP PJSC, UEIP JSC, ChMP JSC, MSZ PJSC) issue and publish on websites the annual public reports on environmental safety to inform the stakeholders, partners, local government bodies, and the public.

ENVIRONMENTAL IMPACT

The facilities of enterprises of TVEL Fuel Company are generally classified as the II category objects causing moderate adverse environmental impact*. However, there are four objects of the I category (metallurgical production) at ChMP JSC where continuous monitoring of their environmental impact is maintained. No excess of the specified standards was registered in 2018.

Energy Saving and Efficiency Improvement Program

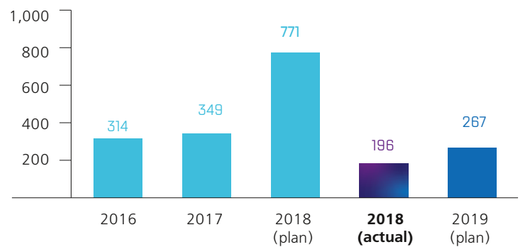
The project on energy consumption reduction and energy efficiency improvement of industrial companies of Rosatom is of great importance for the nuclear industry competitiveness recovery.

TVEL Fuel Company is one of the leaders in introduction of automated systems for accounting of energy resources and methods to improve energy efficiency in the nuclear industry, including processes of energy inspections, formation of long-term investment, organizational and technical programs and specific activities for energy efficiency. The Company's enterprises are involved in Energy Saving and Efficiency Improvement Program (further "the Program") since 2011. The Program was approved subject to the results of energy and thermovisional inspections held at the Company's organizations.

In 2018, the representatives of TUV International Certification LLC carried out a Certification Audit of Energy Management Corporate System (EMCS) at TVEL JSC and its enterprises. As a result of the audit, the identified observations and inconsistencies were eliminated. TVEL JSC and the Company's enterprises received certificates of management system compliance with the requirements of the international standard ISO 50001:2011 for a period of three years. Moreover, during the reporting period TVEL JSC auditors conducted internal audits of the Energy Management Corporate System at the enterprises of TVEL Fuel Company.

DIAGRAM 39

Amount of financing for Energy Saving and Efficiency Improvement Program, RUB mln



Reduced actual funding in 2018 under the Energy Saving and Efficiency Improvement Program is connected with the refusal of measures due to changes in the production programs of the enterprises of the Fuel Company, and with savings due to the adopted technical solutions, as well as with the postponement of measures for subsequent periods due to the need for their additional study (implementation of investment feasibility study, etc.).

In 2018, the energy consumption by the subsidiaries of TVEL Fuel Company was reduced by 5.49% (165.99 mln kWh), heat energy – by 12.3% (288.04 thous. Gcal) as compared to the reference values of 2015 under comparable conditions**. The reduction in energy resources consumption (as compared to 2015) in monetary terms was 10.89% (RUB 1,082 mln) with the target indicator 6%.

AECC JSC took

2nd place

in the annual contest "Environmentally Exemplary Enterprise of the Nuclear Industry". A total of 48 enterprises of Rosatom State Corporation participated in the contest

* According to the Clause 1 of the Article 4.2 of the Federal Law No. 7-FZ "On Environmental Protection" d/d January 10, 2002.

** The year 2015 was chosen as the base year due to the energy auditing of TVEL Fuel Company enterprises and the formation of the Energy Saving and Energy Efficiency Program for the coming years. A similar survey is scheduled for 2020, which will also be considered baseline. Comparable conditions are understood as conditions that allow to compare indicators of the base and current periods.

Reduced energy consumption is not associated with the reduction in the volume of TVEL Fuel Company's production program, it was achieved through the implementation of events within the framework of the Energy Saving and Energy Efficiency Improvement Program.

In conformity with the Order issued by Rosatom State Corporation d/d October 23, 2018 No. 1/1205-П On Approval of Financing for Energy Saving and Efficiency Improvement Program for the period 2018–2022, Rosatom State Corporation set targets to reduce energy consumption by 2025. In 2019, the target Indicator for reduced energy consumption is determined 7% compared to the reference year 2015.

DIAGRAM 40

Reduction of energy consumption at TVEL FC enterprises in 2017 (as compared to 2015) in monetary terms, %

DIAGRAM 41

Total amount of energy saved by efforts to reduce energy consumption and improve energy efficiency, in money terms under comparable conditions, RUB mln

DIAGRAM 42

Electric energy consumption, mln kW·h

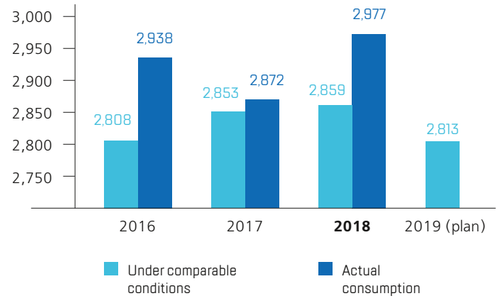


DIAGRAM 43

Heat energy consumption, thous. Gcal

DIAGRAM 44

Electric power and heat energy consumption by TVEL FC enterprises in money terms under comparable conditions, RUB mln

TABLE 37

Primary energy sources consumption, mln GJ*

ENERGY SOURCE	2016	2017	2018 (PLAN)	2018 (ACTUAL)	2019 (PLAN)
Coal	20.71	4.193	0	0	0
Gas	7.53	21.189	0.258	0.313	0.095
Mineral oil	0.25	0.262	0	0	0

* Including generation of electricity and thermal energy by HPPs at TVEL Fuel Company's subsidiaries. In 2017, HPPs at ChMP JSC and UEIP JSC were taken over by OTEK JSC; in 2018, HPP at SGChE JSC will also be taken over. Starting from January 1, 2018, all HPPs of TVEL Fuel Company´s subsidiaries were excluded from the perimeter of the Company. In 2017–2018, OTEK JSC was procuring coal for HPP at SGChE JSC.

TABLE 38

Energy saving by the enterprises of TVEL FC under comparable conditions as compared to 2015, on an accrual basis as a result of efforts to reduce energy consumption and energy efficiency increase

INDICATOR	2016	2017	2018 (PLAN)	2018 (ACTUAL)	2019 (PLAN)
Total amount of saved electric power, mln kWh	118.4	171.53	181.493	165.99	211.74
Total amount of heat energy, thous. Gcal	206.9	268.8	280.97	288.04	304.4
Total amount of electric power and heat energy, thous. GJ	1,291.7	1,742.9	1,829.7	1,803.5	2,036.7

Plans for 2019:

- modernization of drainage pumps at the pumping station No.1 in AECC JSC;
- Introduction of a system of technological data exchange with the automated system of the system operator at OPY-110 kV in AECC JSC;
- modernization of refrigeration units XTM2-1-4000 in PA ECP JSC;
- modernization of general lighting network (including replacement of lamps with LEDs) at ChMP JSC;
- replacement of street lighting fixtures and spotlights with LEDs in Centrotech SPA LLC, etc.

Following the results of 2018, the authoring team of employees in SGChE JSC became the winner of the RPS contest in the nomination "Best SFI with the greatest economic effect" for the implementation of "Optimization of operating mode BU No. 2" project.

As a result of adjusting the temperature mode of the heating network in boiler plant No. 2, the water consumption was reduced at an earlier stage of operation mode. The economic effect was more than RUB 8 mln

TABLE 39

Main activities carried out by the TVEL Fuel Company enterprises that allowed to meet the target for reducing energy consumption in 2018

ENTERPRISE	MEASURES	EFFECTS
AECC JSC	Introduction of energy efficient operating modes for the main and auxiliary equipment of separation plant.	Economic effect is more than RUB 35 mln per year.
	Modernization of the heating network of the area from YT-18 to TK-21B of total length 480 m.	Reduced normative heat losses by RUB 0.4 mln during the heating season.
PA ECP JSC	Changing the mode of water supply to the circuit B-03 due to the pressure change after impellers trimming.	Decrease in energy consumption by 3,892 thous. kWh.
	Reconstruction of the heat network unit Du600 (from TK-1A to TK-7A) using pipelines with foam polymer insulation of total length 2,568 m (replacement of pipelines and insulation).	Reduced heat loss in this area up to 15%.
UEIP JSC	Replacing the refrigeration unit No.10 in building 250 with a new one with high efficiency and cooling ratio more than 7.	Economic effect on reduction of energy consumption is 2 mln kWh.
	Replacing the compressor in building 203 with two interredundant compressors with improved specific energy consumption for compressed air production.	Economic effect on reduction of energy consumption is 5.75 mln kWh.
MSZ PJSC	Decentralization of the compressed air supply system.	The expected economic effect is more than RUB 300 mln.
ChMP JSC	Reconstruction of the general lighting in the buildings 450, 703 (introduction of automated process control systems with switching to LED lamps).	Energy saving in volume terms – 1.11 mln kWh per year.
Centrotech SPA LLC	Installing a circulation pump for the heating system of building 178.	The expected savings in hot water heat consumption is RUB 35,000 per year.

Use and Processing of Materials

The quantity of materials necessary for the manufacture of products at enterprises of the Company is determined by the production program.

Enterprises of separation-sublimation complex use uranium and synthetic materials for products manufacturing. Enterprises of fabrication block use raw materials represented by enriched uranium product. Synthetic materials, ferrous and non-ferrous metals are basically used in the manufacture of gas centrifuges.

All raw materials used by TVEL Fuel Company enterprises are purchased. No renewable materials are used in production. Examples of the used materials are shown in Table below.

Industrial and consumer waste disposal

In 2018, the total amount of industrial and consumer waste of the Company's enterprises was decreased by 23.6% as compared to the level of 2017 and made around 31.8 thous. tons.

Reasons of waste reduction:

- Reorganization of waste record keeping in SGChE JSC: during the first three quarters of 2017, SGChE JSC accounted for all wastes generated in the process of production economic activity of HPP at OTEK JSC; in the fourth quarter of 2017 HPP at OTEK JSC began to account for the generated waste independently;
- Implementation of the investment project "Concentration of Production Facilities of Tochmash VPA JSC and KMZ PJSC".

In technological processes of the enterprises of TVEL Fuel Company the produced waste could not be reused during manufacture of the key products. Non-production waste of hazard class 5 (virtually non-hazardous) was used in 2018 by MSZ PJSC and ChMP JSC (38% and 4% respectively).

The bulk of waste (65.4%) is Hazard Class V (virtually hazardous) waste, mainly consisting of metal scrap and waste, which are delivered to specialized organizations for treatment and disposal.

TABLE 40

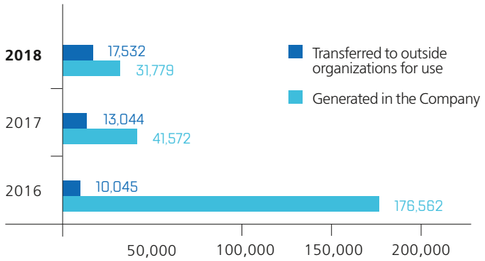
Use of materials for main production by TVEL FC Enterprises, tons*

MATERIAL	2016	2017	2018
Sulfuric acid	713	735	775
Technical sulfuric acid (oleum)	12,247.2	12,664.87	13,162
Nitric acid	18,584.7	22,494.6	19,261
Hydrochloric acid	5,649.0	7,093.1	6,533
Ferrous metals	2,112.0	2,358.5	1,195
Non-ferrous metals	834.9	846.1	422

* The data were retrospectively adjusted due to the changed approach to data collection by the organizations included in management system of TVEL Fuel Company.

DIAGRAM 45

Waste Generation and Recycling, tons*



* Information is provided according to the new form No. 2-TP (waste) approved by the ROSSTAT Order No. 529 "On Approval of Statistical Tools for Organization of Federal Statistical Monitoring of Industrial and Consumer Waste by the Federal Service for Environmental Control" d/d August 10, 2017.

TABLE 41

Share of used waste produced over a year, %

ENTERPRISE	2016	2017	2018
ChMP JSC	135*	11	4
MSZ PJSC	56	55	38
AECC JSC	1	2	0
Tochmash VPA JSC	1	1	1
Total for TVEL FC**	**5.80**	**7.17**	**5.94**

* Including waste received from outside organizations for use in accordance with the license for waste disposal.

** Share in the total volume of waste generation by all enterprises of TVEL Fuel Company.

Water Consumption and Water Disposal

In 2018, withdrawal of water by the enterprises of the Company increased by 36% and made 545.9 mln m³, water consumption for own needs decreased by 62% to 120.0 mln m³. Thus, 257.1 mln m3 of water were disposed by the Company's enterprises (58.2% of the standard), which is the main share of water disposal.

The main source of water withdrawal is represented by natural sources 71.2% (388.4 mln m³). Water is being withdrawn by the enterprises of TVEL Fuel Company from natural sources in accordance with the set standards. Water withdrawal from public and other water supply systems was 157.5 mln m³ in 2018.

In 2018, the standard of water withdrawal was set at 669.6 mln m3, the actual volume of withdrawal was 81.5% of the set standard.

In 2018, the volume of return water was 267.7 mln m³. The share of return water of the total amount of withdrawn water was 49%, the share of reused water in the total volume of withdrawn water was 14%.

Reasons for increase in volumes of water withdrawal by TVEL Fuel Company:

- Increase of water use by HPP-9 of Irkutskenergo JSC, the client of AECC JSC, due to the increased demand for electrical capacities;
- change in the balance scheme of water supply and disposal in the second half of 2017, specifically the transfer of output No. 1 from TVK LLC to ChMP JSC and conclusion

DIAGRAM 46

Structure of waste generation at TVEL FC enterprises, %

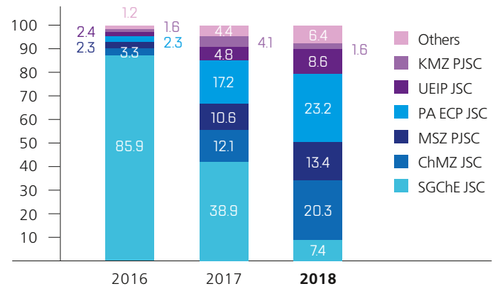


DIAGRAM 47

Water consumption in 2015–2017, mln m³*

* Actual consumption method is mainly used in calculation of water consumption indicators at the Company's enterprises.

TABLE 42

Waste generated at TVEL FC enterprises by hazard classes, thous. tons

INDICATOR	2016	2017	2018	Δ 2018/2017
Total waste, including:	**176.6**	**41.6**	**31.8**	**–23.6%**
Hazard Class I	0.09	0.04	0.08	**82%**
Hazard Class II	0.05	0.02	0.01	**–43%**
Hazard Class III	0.43	0.49	0.41	**–18%**
Hazard Class IV	8.92	9.36	10.44	**12%**
Hazard Class V	167.1	31.7	20.8	**–34%**

with ChMP JSC contracts for receiving waste water from clients to the industrial sewage system;

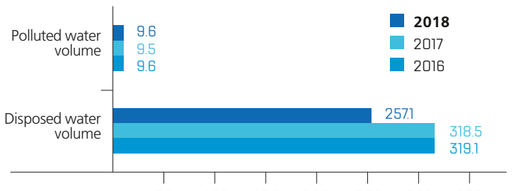
- transfer of HPP property complex from SGChE JSC to OTEK JSC. A new subscriber, the Seversk branch of OTEK JSC appeared in the water supply and water disposal plan of SGChE JSC. At water intake, most of the river water is transferred to HPP of OTEK JSC for use. Used HPP waste waters return to the Northern waste canal of SGChE JSC and are discharged into the river Tom together with the waste waters of SGChE JSC.

Reasons for decrease in volumes of water consumption by TVEL Fuel Company:

- transfer of the equipment of workshop 5 on calcium production of ChMP JSC to the circulating water supply;
- comprehensive testing and trial operation of the new circulating water supply system based on the existing hydraulic facilities of AECC JSC;
- transfer of HPP property complex from SGChE JSC to OTEK JSC and the appearance of a new subscriber in the water supply and water disposal plan of SGChE JSC, Seversk branch of OTEK JSC. In this connection, more than 90% of the water used by SGChE JSC in 2017 is assigned to this subscriber in 2018.

DIAGRAM 48

Water disposal by enterprises of TVEL FC, mln m³



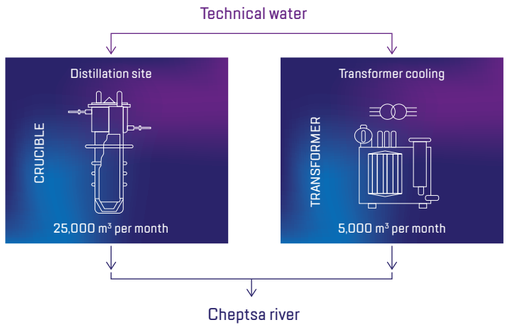
IMPLEMENTATION OF THE CIRCULATING WATER SUPPLY SYSTEM IN WORKSHOP NO. 5 OF CHMP JSC

Industrial water (technical raw water of the Cheptsa river) is widely used in the calcium production by ChMP JSC as cooling water for the process equipment in volumes about 30 thous. m³ / month. Previously, waste water of high temperature was discharged into the sewage system in the Cheptsa river.

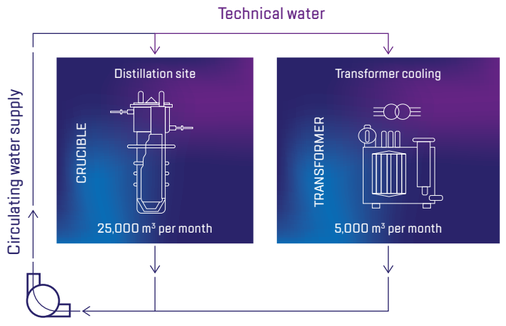
Specialists of ChMP JSC developed and implemented technical measures for circulating water supply of calcium production, the implementation of which has significantly reduced the negative impact on the environment.

At the end of 2017 and 2018, the Company implemented the activities which helped to reduce the consumption of industrial water and eliminate its discharge into the Cheptsa river. The cost of these activities amounted to RUB 3.7 mln.

Scheme of industrial (technical raw) water consumption before the appearance of circulating water supply



Scheme of industrial (technical raw) water consumption after the appearance of circulating water supply



Pollutant Emissions

In 2018, total pollutant emissions into the atmosphere by the Company's enterprises decreased by 61.4% and amounted to 1.5 thous. tons (48% of the set standard).

Reduction of pollutant emissions is explained by:

- reorganization of emissions accounting at SGChE JSC: during the first three quarters 2017, Seversk branch of OTEK JSC enjoyed the authorization for pollutants emissions obtained by SGChE JSC till the transfer of HPP property complex of SGChE JSC to OTEK JSC;
- reduction in radioactive waste processing volumes at UEIP JSC in order to extract uranium from RW using high-temperature combustion method;
- implementation of the investment project "Concentration of Production Facilities of Tochmash VPA JSC and KMZ PJSC";
- suspension of depleted uranium oxide concentrate production at ChMP JSC;
- reconstruction of technological processes at MSZ PJSC, suspension and temporary closing of a number of production buildings for a year.

The largest volumes of emissions were reported at ChMP JSC. This is due to technological processes of chemical metallurgical production.

Slight increase of ozone-depleting substances emissions by TVEL Fuel Company is stipulated by:

- identification of a new emissions source when conducting an inventory of sources of harmful chemicals emissions in 2017 at SGChE JSC;
- commissioning of refrigerating machines in AECC JSC due to production needs.

Decrease in nitrogen and sulphur oxide emissions by 90% and 66% correspondingly is stipulated by overall emissions decrease reasons given above. In 2018, emissions of solid substances amounted to 0.14 thous. tons, and volatile organic compounds – 0.49 thous. tons.

In 2018, greenhouse gas emission intensity amounted to RUB 5.65 tons/mln of revenue (in 2017 – RUB 5.11 tons/mln). The emissions from technological processes form the bulk of greenhouse gas emissions at TVEL Fuel Company.

DIAGRAM 49

Total pollutant emissions, thous. tons

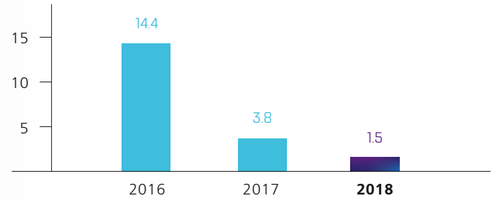


DIAGRAM 50

Emissions of ozone-depleting substances, tons

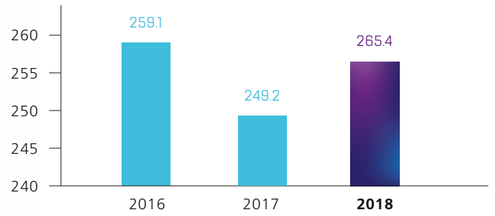
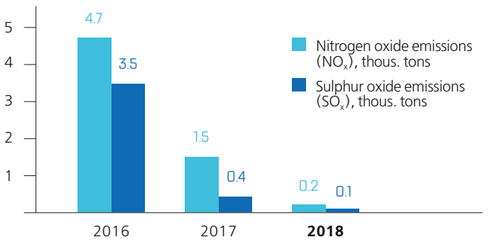


DIAGRAM 51

Emission of specific pollutants, thous. tons*



* Determined by computational method along with instrumental verification.

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Relative Impact of the Fuel Company Enterprises on the Environment in the Regions of Presence

The enterprises included in the management system of TVEL Fuel Company are located on lands that are owned by the enterprises, as well as on lands that are used on a leasehold basis and are owned by the Russian Federation. Industrial sites of the enterprises and adjacent territories are not referred to the territories with high valued biodiversity, they are not inhabited by animals and plants included in the IUCN (International Union for Conservation of Nature and Natural Resources) Red List and the national list of protected species.

The Russian environmental legislation sets the standards of admissible impact on the environment to provide compliance with the environmental quality standards. The enterprises, in their turn, follow the standards of admissible impact of the environment, and, thus, they do not create threats to animals and plants inhabiting the areas adjacent to the enterprises of TVEL Fuel Company.

Taking into account the fact that industrial sites of the enterprises do not affect the territories with high valued biodiversity, there is no impact of activity, products and services on endangered and valuable species.

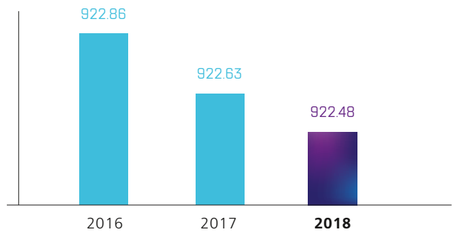
In accordance with the Russian Federation nature protection laws TVEL Fuel Company enterprises set the standards of admissible impact on the environment that ensure the environmental quality preservation. Strict compliance with the standards of admissible impact on the environment by the enterprises ensures the absence of threats to animals and plants inhabiting the areas adjacent to the Company's enterprises.

The impact of the major part of the Company's enterprises on the environment of the regions of presence is in general less than 5% of the total impact of industrial facilities on the environment of the corresponding regions. This level of exposure corresponds to the following indicators:

- AECC JSC (2.5% of waste water discharge in Irkutsk region);
- PA ECP JSC (4.2% of waste water discharge in Krasnoyarsk territory);
- UEIP JSC (0.8% of waste water discharge in Novosibirsk region);
- SGChE JSC (0.3% of waste in Tomsk region).

DIAGRAM 52

Carbon dioxide equivalent greenhouse gas emissions, thous. tons*



* The carbon dioxide emissions were taken into consideration to determine greenhouse gases emissions, because carbon oxide emitted into the atmosphere from anthropogenic sources is oxidized to carbon dioxide. The indicators were determined by computational method and recalculated in accordance with the Methodological Guidelines used to Quantify the Greenhouse Gas Emissions by Organizations that Carry out Economic and Other Activities in the Russian Federation, approved by the Order No. 300 of the Ministry of Natural Resources d/d June 30, 2015, namely:

1. Formula No. 2 of the Methodological guidelines was used in computation.
2. The amount of CO2 emissions was calculated by conversion from CO (multiplied by factor1.57).
3. Emissions of CH4 (methane) of UEIP JSC and emissions of perfluoromethane (freon 14) of ChMP JSC, subject to GWP specified in the Appendix No. 3 of the Methodological Guidelines, were also taken into account in calculating the total amount of greenhouse gas emissions at TVEL Fuel Company.

The 5% level was exceeded by SGChE JSC (53.6% of waste water discharge in Tomsk region) and ChMP JSC (6.3% of waste water discharge in the Udmurt Republic). At the same time, it should be noted that SGChE JSC receives all waste water from Seversk (including from HPP and social facilities of the city) due to the fact that it is the only enterprise that has waste water outlets to the Tom river within the boundaries of the city.

The share of impact of the rest of TVEL Fuel Company enterprises in the total impact of economic activities on the environment in the regions of presence is insignificant.

No emergencies and incidents resulting in negative environmental impact occurred in 2018 at the enterprises of TVEL Fuel Company

The activities aimed at reduction of adverse environmental impact of the enterprises in 2018:

- replacement of metering devices for domestic waste water discharged from the industrial site of AECC JSC;
- creation of the circulating water supply system based on the existing hydraulic facilities of AECC JSC;
- modernization of refrigeration units XTM2-1-4000 and reduction in industrial water consumption due to commissioning of two refrigerating machines of air conditioning systems in building 901 of PA ECP JSC;
- modernization of gas exchange and gas cleaning ventilation in the chemical workshop PA ECP JSC;
- creation of a circulating water supply system for calcium production in ChMP JSC;
- creation of a system for collecting, cleaning and preparing industrial water for technical water supply MSZ PJSC;
- works on conservation of B-1 and B-25 ponds for storing radioactive waste in SGChE JSC.

Plans for 2019 aimed at reduction of adverse environmental impact of the enterprises

- commissioning of the system for collecting, cleaning and preparing industrial water for technical water supply at MSZ PJSC;
- modernization of refrigeration machine XTM -2-1-4000 in PA ECP JSC;
- modernization of twelve sections of the gas centrifuge equipment in building 903 of PA ECP JSC;
- continuation of works on conservation of B-1 and B-25 ponds for storing radioactive waste in SGChE;
- modernization of the pumping equipment installed at the on-shore pumping station No. 1 of AECC JSC;
- creation and launching of the module unit on soil demercurization at NCCP JSC;
- creation of a site for conditioning and intermediate storage of radioactive waste at UEIP JSC.

In 2018, at ChMP JSC, which has facilities of category I on the negative environmental impact, TVEL JSC with participation of Rosatom SC, ANO NIIPE and BAT Bureau organized and conducted a business game "Issuing a Comprehensive Environmental Permit", within the framework of which the BAT compliance with the existing techniques of the category I facilities at ChMP JSC was analysed. Subject to the Business Game results the management of ChMP JSC received the relevant recommendations

Best Available Techniques

TVEL JSC and its subsidiaries regularly operate with the Best Available Techniques Bureau (BAT) on participation in development of information and technical BAT manuals.

EXPENSES RELATED TO ENVIRONMENT PROTECTION

In 2018, operating expenses of the Company enterprises for environment protection amounted to RUB 2,203.8 million. Target funds, that were allocated in the framework of the investment and project activities of TVEL Fuel Company and Rosatom State Corporation, were used to finance both technical and organizational arrangements.

DIAGRAM 53

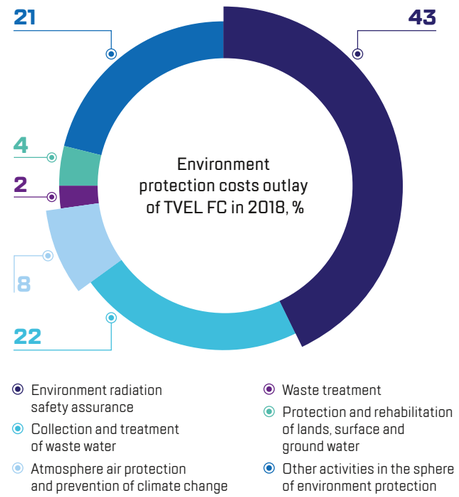


TABLE 43

Innovative technology solutions aimed at reducing the environmental impact of enterprises of TVEL FC

ENTERPRISE	YEAR	TECHNOLOGY SOLUTION	EFFECTS
MSZ PJSC	2019	Commissioning of the system for collecting, cleaning and preparing industrial storm waters for technical water supply at storm water outlets.	Reduction in natural resources utilization (refusal of river water intake). Elimination of pollutants discharge from the industrial site into the water body – the Marinka river.
NCCP PJSC	2019	Launching of the module unit on soil demercurization.	Bringing to the sanitation standards the territory of the industrial site polluted during the times of the Soviet defence programs implementation.
	2020	Commissioning of the Liquid Waste and Solid Radioactive Waste Processing Complex.	Reducing the flow of liquid waste and solid radioactive waste to the tailing dump.
PA ECP JSC	2022	Commissioning of the second stage of W-ECP unit on defluorization of depleted uranium hexafluoride.	Possibility to additionally covert up to 10,000 tons per year of potentially dangerous uranium hexafluoride into a stable chemical form – uranium oxide concentrate (a substance close to the natural state of uranium ores and suitable for safe long-term storage). Halving the production area occupied by containers with aggressive uranium compounds.

TABLE 44

Expenses of TVEL FC related to environment protection, RUB mln*

EXPENDITURE ITEMS	2016	2017	2018	2019 (PLAN)
Radiation safety assurance	726	848	944	850
Waste water collection and treatment	473	480	483	480
Atmosphere air protection and prevention of climate change	219	209	180	210
Waste disposal	135	121	38	120
Protection and rehabilitation of lands, surface and ground water	51	56	95	57
Other activities in the sphere of environment protection	502	492	463	495
Total:	**2,106**	**2,207**	**2,204**	**2,212**

* Funds used to finance both technical and organizational arrangements.

The share of expenses is related to the activities for environment radiation safety assurance (RUB 944 mln). Considerable expenses are related to collection and treatment of waste water (RUB 483 mln).

The share of environment protection expenses of TVEL Fuel Company falls on SGChE JSC, UEIP JSC and NCCP PJSC.

In 2018, total amount of payments for negative impact on the environment increased by 2.2% as compared to the previous year and amounted to RUB 11.01 mln.

In the reporting year, the enterprises included in the management system of TVEL Fuel Company were not subject to any non-financial fines and penalties for negative environmental impact; no damage was caused to the environment.

DIAGRAM 54

Structure of payments for negative environmental impact, RUB mln

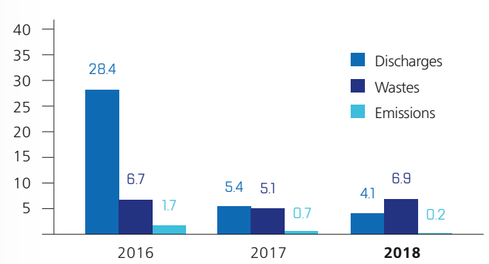
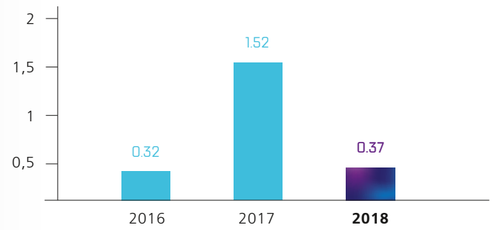


DIAGRAM 55

Fines and penalties collected for the impact caused to the environment, RUB mln



THE MAIN PROGRAM DOCUMENTS ON NRS ARE AS FOLLOWS:

- Fundamentals of State Policy in the Sphere of Nuclear and Radiation Safety of the Russian Federation up to 2025
- Federal Target Program "Nuclear and Radiation Safety Assurance for 2016–2020 and up to 2030"

NUCLEAR AND RADIATION SAFETY

Activities of TVEL Fuel Company are carried out in accordance with the laws of the Russian Federation pertaining to the use of nuclear power with due account to IAEA requirements.

Assurance of nuclear and radiation safety (NRS) of facilities of the Company enterprises, prevention and exclusion of any possibility of inadmissible exposure of the personnel, population and environment to radiation are the key priorities of environmental policy of TVEL Fuel Company.

Federal Target Program "Nuclear and Radiation Safety Assurance for 2016–2020 and up to 2030"

Within the strategic initiative "Environmental Responsibility" of TVEL Fuel Company, the works are ongoing for liquidation of "nuclear heritage", including rehabilitation of contaminated areas.

Since 2016 there is a new Federal Target Program "Nuclear and Radiation Safety Assurance for 2016–2020 and up to 2030"(FTP NRS-2), http://фцп-ярб2030.рф)*.

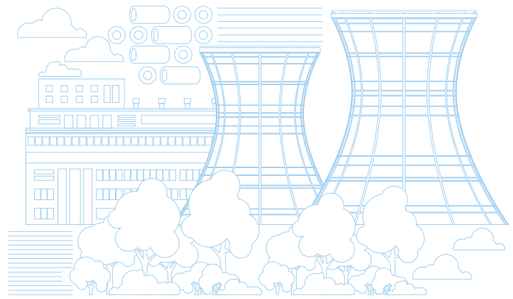
FTP NRS-2 includes 17 events of TVEL Fuel Company to the total amount RUB 38.0 billion, including RUB 33.8 billion out of the federal budget. The said arrangements will be performed at facilities of SGChE JSC, AECC JSC, UEIP JSC, NCCP PJSC, MSZ PJSC, VNIINM JSC. In this regard decommissioning of radiation sources in the laboratory of resource tests of OKB-Nizhny Novgorod JSC was completed ahead of schedule in 2016 instead of the planned 2018.

Apart from decommissioning of NRHF and rehabilitation of the contaminated territories of FTP NRS-2, the decision was taken on decommissioning of the sublimation production at AECC JSC, production of uranium tetrafluoride at ChMP JSC and chemical metallurgical plant of SGChE JSC. The above

* As amended by the Resolution of the RF Government d/d December 22, 2014 No. 1641.

measures shall be implemented partially at the expense of the special reserve fund No. 3 (Decommissioning and R&D) of Rosatom State Corporation.

One of the key objectives set to the industry is reduction in expenses and production costs to ensure competitiveness on the world market. In this regard, it is planned that by 2030 NRHF will be decommissioned, 470 thousand square meters of territories contaminated with radionuclides territories will be rehabilitated. This will significantly reduce the cost of products manufactured by enterprises of TVEL Fuel Company due to reduction of contaminated areas and subsequent production compaction. Significant means spent annually for safe maintenance of NRHF of TVEL Fuel Company will also be preserved.



Plans up to the year 2030

Decommissioning:

- unit U-5, structure G, beyond-design disposal No.2, 9 at VNIINM JSC;
- structure 2 (building 802) and structure 4 (building 804), sublimation production of AECC JSC;
- radioactive waste storage facilities of buildings 310 at AECC JSC;
- structure No. 242 of MSZ PJSC;
- facilities for processing of irradiated standard uranium slugs of site No.3 at SGChE JSC;
- production of uranium tetrafluoride and depleted uranium at ChMP JSC.

Conservation:

- ponds B-1, B-25, pulp dumps PKh-1, PKh-2, storage facilities No.263, 765, 765/2, 757, 757а, 757в, 757г, 781/1 at site No.16 of SGChE JSC;
- tailing dumps at NCCP PJSC.

TABLE 45

Execution of works under the FTP "Nuclear and Radiation Safety Assurance for 2016–2020 and up to 2030" at the sites of the Company's subsidiaries at the expense of the federal budget*

SUBSIDIARY	NAME OF ENTERPRISE	SCOPE OF FINANCE, RUB MLN		
			2018 (ACTUAL)	2019 (PLAN)
Siberian Group of Chemical Enterprises (SGChE JSC)	Reconstruction of facility 13 at Radiochemical Plant	60.0	60.0	0.0
	Conservation of B-1 storage bay	96.0	96.0	100.0
	Conservation of B-25 pond	97.0	97.0	200.0
Angarsk Electrolysis Chemical Complex (AECC JSC)	Decommissioning of structure No. 2 (Building 802) and structure No. 4 (Building No. 804)	176.6	176.6	176.7
TOTAL at the Company's sites		**429.6**	**429.6**	**476.7**

* Taking into account the savings following the results of tendering procedures.

COMPETENCE CENTERS FOR DECOMMISSIONING

In 2018, SGChE JSC, AECC JSC, CPTI JSC and VNIINM JSC have launched the process of forming competence centers for decommissioning nuclear and radiation hazardous facilities.

The main goal of the competence centers for decommissioning of nuclear and radiation hazardous facilities is to perform works on NRHF decommissioning with their own resources both on their sites and in Russia, and abroad.

This area will allow the TVEL Fuel Company to create new jobs and receive additional revenue.

Moreover, at the end of 2018 it was decided to elect TVEL JSC the responsible organization of the nuclear industry for the development of business for decommissioning of nuclear and radiation hazardous facilities.

TABLE 46

Sources of financing for liquidation of the nuclear "heritage" in 2018

SOURCES	Number of activities	Scope of financing, RUB mln	LIST OF MAJOR ACTIVITIES
The Federal Budget within the Federal Target Program "Nuclear and Radiation Safety Assurance for 2016–2020 and up to 2030" (FTP)	4	429.6	- Decommissioning of structure No.2 (Building 802) and structure No.4 (Building 804) of AECC JSC; - Conservation of B-1 and B-25 ponds, - Reconstruction of the site No.13 at SGChE JSC.
The Special Reserve Fund No. 3 "Decommissioning and R&D" of Rosatom State Corporation	29	607.9	- Decommissioning of "Makety" Warehouse Complex at NCCP PJSC; - Preservation of solid radioactive waste storage at site No.16 of SGChE JSC, - Decommissioning of facility M2079 at SGChE JSC, - Preparation for decommissioning of structure A at VNIINM JSC.
Reserve No. 3 "Decommissioning of R&D" remaining at the disposal of the organization	9	22.4	- Creation of an experimental demonstration stand of technologies, methods and equipment for decontamination at VNIINM JSC, - Creation of a hardware-methodical complex for measuring the specific activity of alpha- and beta-emitting radionuclides in materials of low activity level at VNIINM JSC.

TABLE 47

Implementation of Federal Target Program "Nuclear and Radiation Safety Assurance for 2016–2020 and up to 2030"

INDICATOR	UNIT	PLANNED	ACTUAL
Number of INES violations of level 2 and higher	units	0	0
Commissioning of spent nuclear fuel repositories	thous. tons	0	0
Commissioning of spent radioactive waste repositories	thous. m^3	0	0
Preparation for decommissioning of nuclear and radiation-hazard facilities	units	0	0
Number of decommissioned nuclear and radiation-hazard facilities	units	4	4

REHABILITATION OF THE AREAS CONTAMINATED BY RADIONUCLIDES

Lands contaminated with radionuclides are within the area of professional responsibility of MSZ PJSC, NCCP PJSC, ChMP JSC and SGChE JSC.

No contamination of new areas occurred resulting from activities of the subsidiaries of TVEL Fuel Company in the reporting year. All identified contaminated areas are consequence of activities of the enterprises focusing on improving the defensive ability of the country during the period of the "nuclear shield" creation

In the reporting year, the emissions of radionuclides into the atmosphere were within the permissible limits.

In the late 2018, the total area of territories contaminated with radionuclides subject to rehabilitation amounted to 15,323.3 thous. m^2.

In 2018, the Company carried out works on rehabilitation of the areas under "Makety" Warehouse Complex at NCCP PJSC. The area was also rehabilitated as part of the work to eliminate the radiation source at Centrotech-SPb JSC.

DIAGRAM 56

Investments into the development of radioactive waste and spent nuclear fuel treatment technologies, RUB thous.

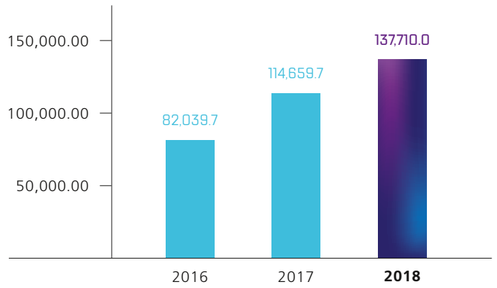


TABLE 49

Pollution of the environment with radionuclides as of the end of 2018

SUBSIDIARY COMPANY	AREAS CONTAMINATED WITH RADIONUCLIDES, THOUS. M^2			
	TOTAL	Including:		
		Sanitary protection zone	Area of professional responsibility	Industrial site
MSZ PJSC	144.5	0	90.0	54.5
NCCP PJSC	372.3	210.0	0	162.3
ChMP JSC	202.5	0	0	202.5
SGChE JSC	14,604.0	333.0	0	14,271.0
Total	**15,323.3**	**543.0**	**90.0**	**14,690.3**

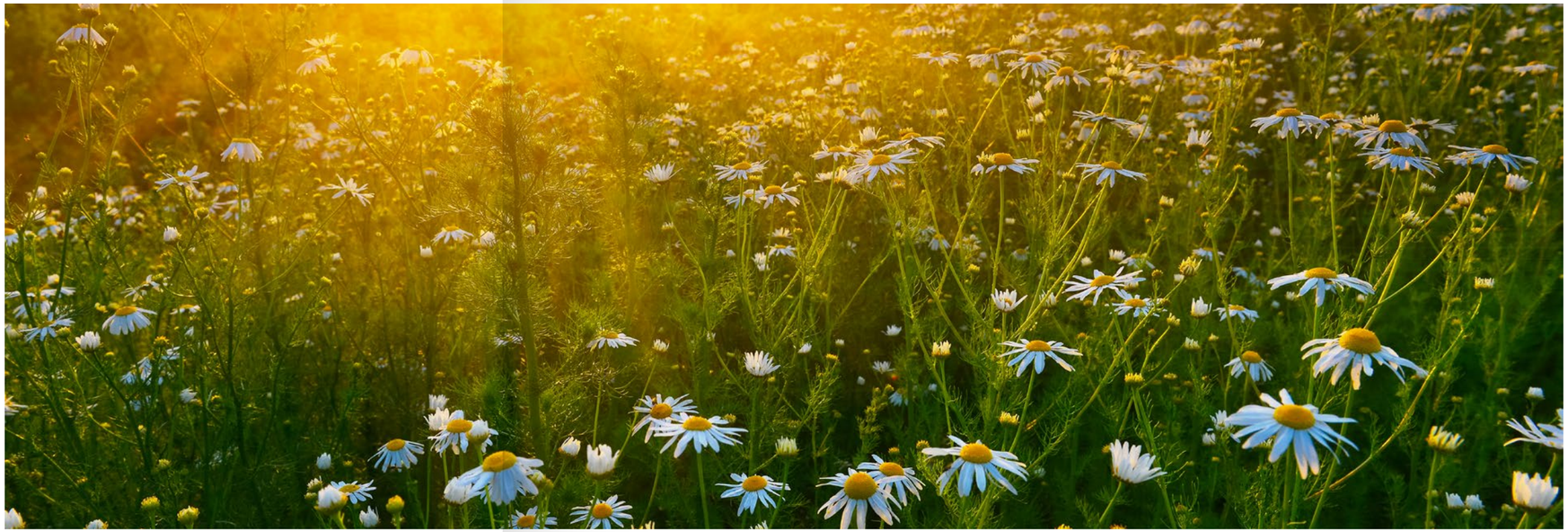


TABLE 48

Pollution of the environment with radionuclides (RN)

INDICATOR	2016	2017	2018	2019 (PLAN)
Emission of alpha-active RN into the atmosphere, Bq	$4.50 \cdot 10^9$	$5.07 \cdot 10^9$	$4.76 \cdot 10^9$	$6.41 \cdot 10^9$
Presence of areas contaminated with RN, thous. m^2	$3.22 \cdot 10^9$	$3.41 \cdot 10^9$	$4.31 \cdot 10^9$	$4.74 \cdot 10^9$
Discharge of waste water containing RN, Bq	$1.04 \cdot 10^9$	$1.09 \cdot 10^9$	$1.50 \cdot 10^9$	$1.00 \cdot 10^9$

The Company implements the concept of defence-in-depth based on physical barriers to ionizing radiation proliferation at all stages of nuclear facilities life cycle.

During product transportation TVEL JSC ensures compliance with the Regulations for the Safe Transport of Radioactive Materials NP-053-16 and IAEA SSR-6 Regulations for the Safe Transport of Radioactive Materials, as well as other international documents on transport.

Most of radioactive wastes located at the sites of TVEL JSC subsidiaries are placed in temporary RW disposal sites (55.7% of the total volume in m3) and long-term RW storage facilities (39.4%). In the reporting year, 363,982.4 m3 of RW were delivered to a specialized organization for disposal.

TABLE 50

Rehabilitation of the areas contaminated by radionuclides (RN), thous. m²

INDICATOR	2016	2017	2018	2019 (PLAN)
MSZ PJSC	0.0	0.0	0.0	0
NCCP PJSC	0.0	12.1	7.1	14.5
ChMP JSC	0.0	0.0	0.0	0
SGChE JSC	0.0	0.0	0.0	0
AECC JSC	0.0	0.0	0.0	65.2
UEIP JSC	0.0	0.0	0.0	0
VNIINM JSC	0.0	0.4	0.0	1.4
Centrotech-SPb JSC	0.0	0.0	1.3	0
Total	**0.0**	**12.5**	**8.4**	**81.1**

TABLE 51

Presence of RW on the sites of TVEL Fuel Company subsidiary sites by the level of radioactivity as of 31.12.2018

INDICATOR	UNIT	LEVEL OF RADIOACTIVITY			
		HIGH	MEDIUM	LOW	VERY LOW
Presence of RW on the sites of TVEL Fuel Company subsidiaries as of the end 2018, total	m^3	13,176	291,451	4,256,467	5,882,466
	Bq	$8.52 \cdot 10^{16}$	$1.94 \cdot 10^{18}$	$7.35 \cdot 10^{14}$	$2.38 \cdot 10^{14}$
Accumulated before July 15, 2011 ("heritage")*	m^3	13,000	291,261	3,865,385	5,816,078
	Bq	$8.50 \cdot 10^{16}$	$2.00 \cdot 10^{18}$	$7.02 \cdot 10^{14}$	$2.08 \cdot 10^{14}$
Produced after July 15, 2011, total	m^3	366	49,037	780,421	40,260
	Bq	$1.47 \cdot 10^{14}$	$8.80 \cdot 10^{15}$	$2.27 \cdot 10^{13}$	$4.98 \cdot 10^{12}$
Produced in the reporting year	m^3	120	68	322	6,290
	Bq	$9.90 \cdot 10^{12}$	$6.10 \cdot 10^{13}$	$3.01 \cdot 10^{11}$	$2.88 \cdot 10^{11}$

* Date of entry into force of the Russian Federation Federal Law No. 190-FZ d/d July 11, 2011 "On Radioactive Waste Treatment and Amendments to a Number of Legislative Acts of the Russian Federation" that delimits the ownership between the Russian Federation and the companies that produce new radioactive waste.

INDUSTRIAL SAFETY

In accordance with the legislative requirements the organizations operating hazardous production facilities and included to the management system of TVEL JSC concluded compulsory civil liability insurance contracts for damage resulting from an accident at hazardous production facilities. The Company conducts emergency trainings according to the developed schedules, financial resources and material resources reserved for localizing and eliminating the consequences of accidents. According to the schedules developed by the operating organizations, industrial safety examinations and technical diagnostics are carried out in order to evaluate technical devices of hazardous production facilities and extend the operating life of technical devices of nuclear facilities. The Company carries out works on the new acid storage facility commissioning at MSZ JSC, reconstruction of acid storage facility at SGChE JSC, construction of a new chemically hazardous production facility at ChMP JSC.

FIRE AND DISASTER PREVENTION

In 2018, TVEL Fuel Company continued to improve facility-specific system of emergency prevention and response, and fire safety system

All enterprises of the Company worked out the documents regulating the actions of the management, emergency services, response forces and employees in natural and man-made emergencies, and created the reserves of financial and material resources to eliminate such situations.

The EMS on-duty dispatching service of the Fuel Company enterprises performs everyday collection and analysis of the information about natural and technogenic environment in the areas of nuclear and radiation hazardous facilities and sites.

Non-staff emergency response teams were formed at TVEL JSC enterprises. These teams were certified by the industry certification commission of TVEL JSC, they have the necessary material and human resources to response emergency and be in a state of constant readiness.

TVEL FC enterprises together with Civil Defence and Emergency Management Agencies carried out quarterly tests of the horns and loud-speaking systems to control the technical readiness of local emergency alarm.

Information is transmitted to the Situation and Crisis Management Centre of Rosatom SC, control bodies of functional and territorial subsystems for ES prevention and response via municipal, intercity telephone networks, cellular communications, departmental communications of Rosatom State Corporation, Internet e-mail, ViP-Net departmental secure e-mail and stationary and mobile VHF radio stations.

To ensure the readiness for emergency and fire management, TVEL Fuel Company enterprises held the drills involving deployment of material and human resources of both the enterprises and the interacting forces of territorial and functional subsystems of the Single State Emergency Management System. In 2018, there were held 536 drills and trainings, including 6 snap drills.

To control the readiness of TVEL Fuel Company for freshet and fire season, on April 17, 2017 there was held a divisional drill with deployment of material and human resources of the enterprises and the interacting forces of EMERCOM of Russia, branches of the Emergency Center SPb FSUE, FMBA of Russia, Atom-Okhrana FSUE, etc. The training showed the readiness of organizations to counteract dangerous seasonal natural phenomena and a high level of interaction of all participating forces. The level of practical skills of emergency system officials of TVEL Fuel Company on communication organization, transmission of control and warning signals, informational interaction in the course of emergency and natural man-made emergency situations protection has been improved. Considerable efforts were made to improve fire safety by carrying out organizational and technical measures, which made it possible:

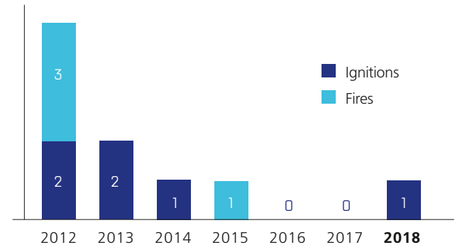
- to ensure continuous monitoring of fire situation in forests on industrial sites, surrounding areas, to prevent wildfires;
- to improve the quality of training of managers and specialists responsible for fire safety in specialized training centres, and to upgrade the system of fire safety briefing of employees;
- to ensure further development of the volunteer fire-fighter movement, holding of contests and competitions.

Continuation of works on:

- the implementation of investment projects aimed at re-equipment of facilities with automatic fire fighting systems to 100%;
- reducing the number of violations found by the state fire supervisory authorities of the EMERCOM of Russia. Overall reduction in number of violations of fire safety requirements over the past seven years is 64.8%.

DIAGRAM 57

Number of fires and ignitions in TVEL FC



EMERGENCY PREPAREDNESS AND RESPONSE

Activity intended to ensure emergency preparedness and response of the Fuel Company subsidiaries is carried out in eight key areas.

Non-staff emergency response teams were formed at the Company's enterprises. These teams were certified by the industry certification commission of TVEL JSC, they have the necessary material and human resources to response emergency and are maintained in continuous readiness.

KEY AREAS OF ACTIVITY TO ENSURE EMERGENCY PREPAREDNESS AND RESPONSE BY TVEL JSC SUBSIDIARIES

1. Development of radiation, chemical and environmental situation monitoring systems and local warning systems
2. Continuous readiness of emergency rescue teams
3. Updating of emergency response plans at major industrial facilities
4. Emergency response drills under accident and emergency plans
5. Setting up and maintaining the emergency preparedness and response packages at hazardous industrial facilities
6. Introduction of corrective and compensatory measures to prevent industrial accidents
7. Interaction with Emergency Centre SPb and its affiliates to ensure emergency preparedness in transportation of dangerous goods and industrial safety
8. Maintenance of on-duty dispatching service system in readiness

SGCHE JSC IMPROVES THE AUTOMATED RADIATION MONITORING SYSTEM

In March — December 2018, SGChE JSC conducted trial operation of the Automated Radiation Monitoring System (ARMS) after its modernization.

The equipment to measure gamma radiation dose rate and data transfer was installed in all 10 radiation monitoring stations. Data collection unit was installed in the workplace of the shift supervisor of SGChE JSC, conducting round-the-clock control over the operation of the enterprise. The information board was mounted and connected over the central entrance to plant building (Seversk).

Apart from measuring gamma radiation dose rate, the updated ARMS will provide the possibility of carrying out a spectrometric analysis to determine the radionuclide composition and number of radionuclides in air and sewage waters of the plant. The ARMS includes mobile installations of radiation gamma surveying on the ground with the possibility of coordinates recording using GPS and transfer of measurement results to data collection points via cellular communication.

THE UNIFIED STATE AUTOMATED RADIATION MONITORING SYSTEM OF THE RUSSIAN FEDERATION

The enterprises of TVEL Fuel Company (MSZ PJSC, ChMP JSC, VNIINM JSC, SGChE JSC, UEIP JSC, AECC JSC, PA ECP JSC) operate and constantly improve the Automated Radiation Monitoring Systems (ARMS).

The ARMS of the Fuel Company enterprises are included into the Sector ARMS of Rosatom State Corporation, which in its turn is interconnected with the Unified State Automated Radiation Monitoring System (ARMS).

ARMS is untended for continuous radiation and meteorological control at production facilities of enterprises and in residential areas of the territories of presence. The outcomes are transmitted to the Situation and Crisis Management Center of Rosatom State Corporation, after that they are available at www.russianatom.ru. Modernization will allow to monitor automatically all fixed monitoring stations and to transmit the obtained information to the Situation and Crisis Management Center on an hourly basis.

PHYSICAL PROTECTION AND ANTI-TERRORISM SECURITY OF NUCLEAR FACILITIES

The systems of physical protection (PP) at the enterprises of TVEL Fuel Company are created and operated according to the requirements of current regulatory documents.

In accordance with the Uniform Policy of Rosatom State Corporation and TVEL JSC the system of physical protection, safety and anti-terrorism security of all enterprises (areas) of TVEL Fuel Company is being continuously improved.

In the furtherance of the counter-terrorism security goals all facilities (territories) of the companies included into the management system of TVEL Fuel Company were classified, safety data sheets and amendments thereto were drawn up, the updated summary list of classified facilities (territories) of the company was drafted.

Performance of the systems of physical protection is regularly evaluated in the course of complex and special-purpose inspections by Rosatom State Corporation and TVEL JSC.

In 2018, the security department of TVEL Fuel Company conducted 6 inspections of physical protection and security at nuclear- and radiation-hazardous and high-security facilities of AECC JSC, SGChE JSC, NCCP PJSC, UEIP JSC, KMZ PJSC, Tochmash VPA JSC. In the course of inspections of the systems of physical protection a special attention was paid to verifying the compliance with the requirements of legal regulatory acts, conditions stipulated by the Rostekhnadzor licenses, as well as to corrective actions to eliminate all deficiencies identified by control and supervisory authorities. Analysis of the inspection findings shows that the enterprises of TVEL Fuel Company take measures aimed at enhancement and improvement of the systems of physical protection, safety and counter-terrorism security.

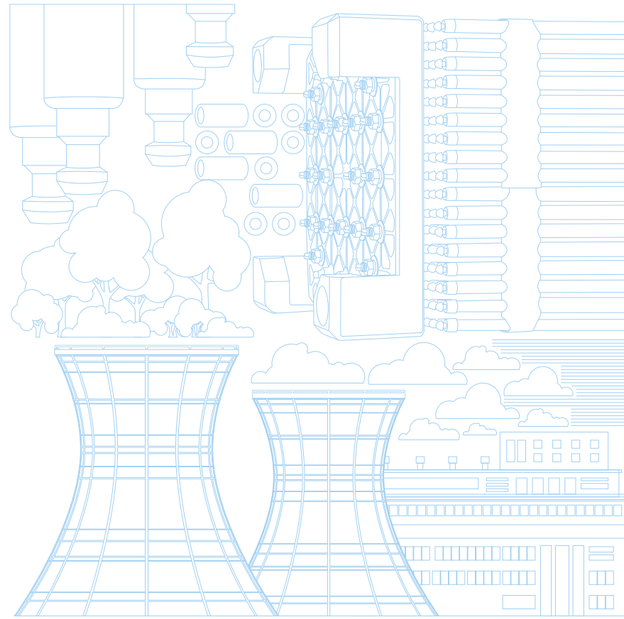
According to the results of inspection analysis:

- the systems of physical protection and security have been created and operate in conformity with the current statutory documents;
- at all nuclear-hazardous facilities the nuclear materials, nuclear units and storage depots are protected against thievery and unauthorized actions; the measures are taken to protect against possible terrorist attacks;
- any deviations from requirements of statutory documents revealed during inspections are analysed and reflected in the improvement plans for the systems of physical protection with allocation of corresponding funds by Rosatom State Corporation.

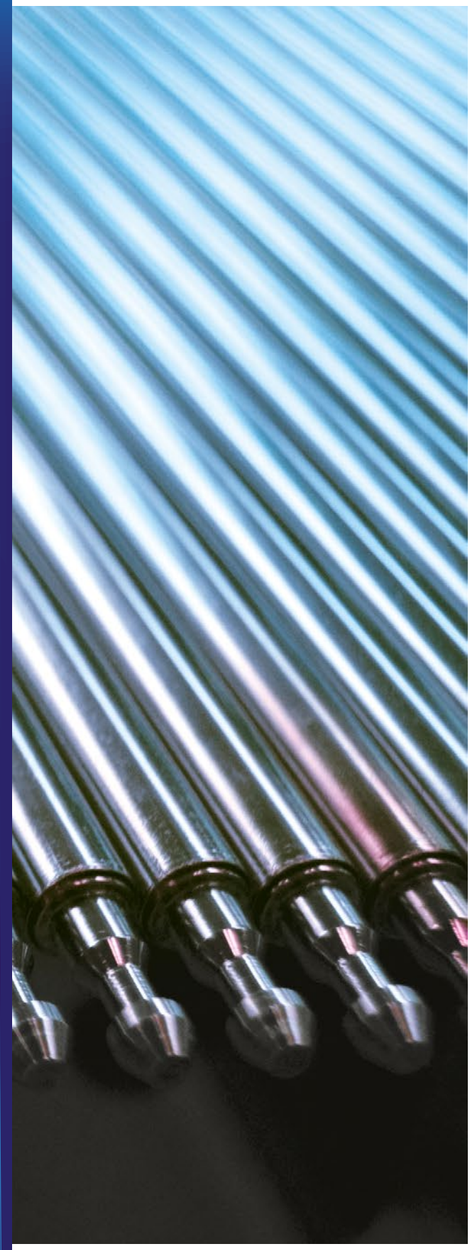
COUNTER-TERRORISM SECURITY OF THE FACILITIES IS REGULATED BY:

- Decree of the President of the Russian Federation dated February 27, 2015 No. 104s;
- Resolution of the RF Government d/d August 29, 2014 No. 876 "On Counter-Terrorism Security of the Facilities (Territories) of Rosatom State Corporation";
- Resolution of the RF Government d/d April 13, 2016 No. 301 "On Amendments to the Requirements Relating to the Counter-Terrorism Security of the Facilities (Territories) of Rosatom State Atomic Energy Corporation";
- Regulatory legal acts of Rosatom and TVEL JSC

In accordance with the program of measures to ensure physical protection and anti-terrorism resistance of the organizations of Rosatom State Corporation (dated 13.11.2017 No. 1/1116-П-дсп) TVEL Fuel Company allocated RUB 792,080.4 thous.



ABOUT THE REPORT



The Public Annual Report of TVEL JSC (hereinafter referred to as the Report) is the tenth integrated report which covers performance of TVEL JSC and its subsidiary companies (together referred to as Rosatom TVEL Fuel Company, TVEL Fuel Company, TVEL FC, the Company) in 2018.

The subsidiary companies of TVEL JSC (AECC JSC, SGChE JSC, UEIP JSC, PA ECP JSC, KMZ PJSC) also publish their integrated reports, which can be found on their official websites.

Reporting cycle	Annual
Format	Integrated
Comparative indicators	For 3 years
Target indicators	Shown for 2019 and the reporting year, where the approved plans are available
Report Profile	TVEL JSC, AECC JSC, SGChE JSC, UEIP JSC, PA ECP JSC, KMZ PJSC, Tochmash VPA JSC, MSZ PJSC, ChMP JSC, MZP JSC, NCCP PJSC, VNIINM JSC, Ecoalliance LLC, Centrotech SPA LLC, Industrial Innovations JSC, Iskra LLC
Priority theme of the Report	New business and products of Rosatom TVEL Fuel Company
GRI disclosure level	GRI Standards Comprehensive Version*
Date of the previous Report publication	May 2018

* Performance indicators and standard elements are generated and presented in the Report in accordance with the Russian Accounting Standards. Financial report data pursuant to the International Financial Reporting Standards (IFRS) are not presented due to later generation thereof.

The purpose of the Report:

- Informing the target audiences, stakeholders and the general public on the results of TVEL JSC in 2018, development strategies and plans for the short and medium term;
- Providing expertise of public acceptability of TVEL JSC performance through the involvement of stakeholders in the dialogue and detailed acquaintance with the reporting materials.

Objectives of the Report:

- Providing complete, reliable and balanced information about the Company's activities in accordance with the GRI Standards requirements;
- Ensuring compliance of the process of preparation of the Report and information in it with the current industry and international standards and recommendations;
- Organization of constructive interaction with stakeholders;
- Development of the institution for interaction with subsidiaries;
- Development and improvement of the system of public annual reporting.

This Report is prepared in compliance with the following regulatory documents:

- Federal Law No. 208-FZ d/d December 26, 1995 "On Joint Stock Companies";
- Federal Law No. 402-FZ d/d December 6, 2012 "On Accounting";
- RF Government Regulation No. 1214 d/d December 31, 2010 (as revised on July 19, 2017) "On improving management procedure of open joint stock companies, the shares of which are under federal ownership and owned by federal state unitary enterprises";
- Provision of the Bank of Russia No. 454-P d/d December 30, 2014 "On Disclosure of Information by the Issuers of Equity Securities";
- Corporate Governance Code (recommended by letter of the Central Bank of the Russian Federation d/d April 10, 2014);
- Uniform Industry Specific Guidelines on Execution of Public Reports in Rosatom and its organizations;
- Sustainability Reporting Guidelines of the Global Reporting Initiative;
- Standard AA1000 APS 2015 of Accountability;
- International Integrated Reporting Framework, version 1.0.

The integrated format of the Report provides detailed description of the Company's performance in the context of the environment and shows its impact on the stakeholders.

The Report discloses the essential information which is important to those who use this Report to assess the performance of the Company. In the course of execution of the Report, a questionnaire was conducted for internal and external stakeholders, and a matrix of material aspects was drawn up.

Aspect boundaries and content of the Report were determined by the Committee on Public Annual Reporting involving the Committee of Stakeholders, and agreed on by TVEL JSC subdivisions. Disclosed issues are material for all subsidiaries from the Report profile, unless otherwise is specified herein. Occupational Health and Safety aspect is important not only for the Company, but also for contractor organizations rendering capital construction services at the Company's facilities. The data on "Occupational Health and Safety" were disclosed on all organizations of TVEL Fuel Company. Data on government subsidies and training in anti-corruption practices are shown only for TVEL JSC.

Coverage of the aspects had no changes as compared to the previous reporting period. No significant reformulations of the indicators given in previous reports were done.

Materiality Determination Process

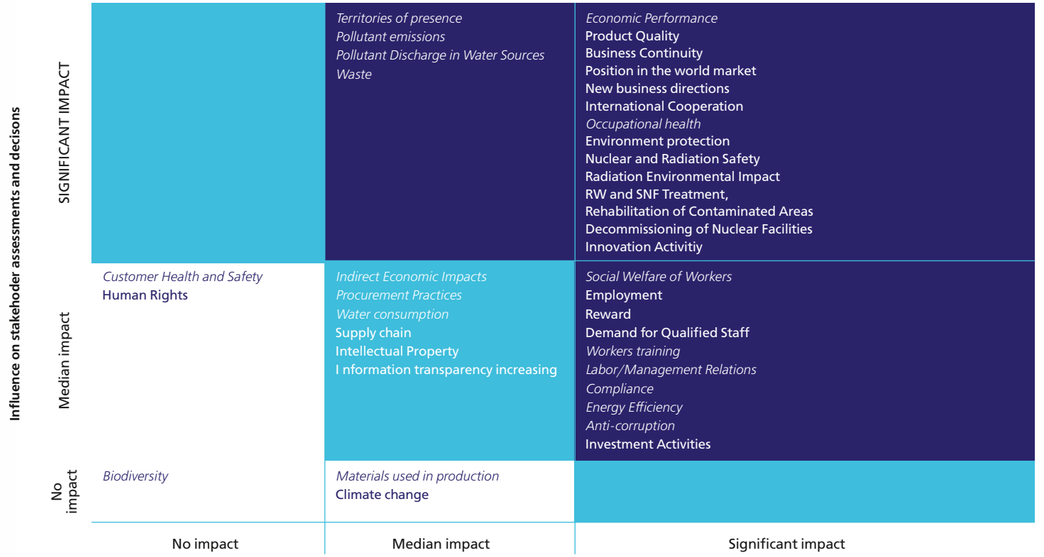
Under conceptual development of the Report 2016, the materiality analysis was carried out in November 2016 in accordance with new GRI Standards, including GRI principles. Representatives of the Company and its key stakeholders were invited to evaluate both the GRI and TVEL Fuel Company-specific topics, which complies with GRI Standards recommendations. Materiality matrix was prepared based on the survey result. When developing the concept of the Report for 2018, the stakeholders were asked to confirm the relevance of the material aspects selected in 2016, or propose changes. As a result of this questionnaire, the matrix of significant aspects did not change.

The matrix has been prepared in axes of "The significance of the Company's impact on economics, environment and society" (average assessment made by managers of the Fuel Company, who took part in survey) and "Influence on stakeholder assessments and decisions" (external stakeholders' assessments). The most essential issues are highlighted in dark blue.

The GRI content index is placed in the interactive version of the Report http://tvel.ru/wps/wcm/connect/tvel/tvelsite/finance/annual_report/

SCHEME 17

Material aspects matrix*



Significance of the Comany's impact on economics, environment and society

* GRI Standards themes are italicized.

TABLE 52

Compliance of the material aspects of TVEL Fuel Company to GRI topics

COMPETITIVE ADVANTAGES OF TVEL FUEL COMPANY	COMPLIANCE WITH GRI TOPICS
Economic Performance	Economic Performance
Occupational Health and Safety	Occupational Health and Safety
Social Welfare of Workers	Employment
Employment	
Workers Training	Training and Education
Labour/Management Relations	Labor/Management Relations
Compliance	Ecological Compliance
Social-Economic Compliance	Social-Economic Compliance
Energy Efficiency	Energy
Territories of Presence	Anti-Corruption
Pollutant Emissions	Local Communities
Pollutant Discharge in Water Sources	Emissions
Waste	Effluents and Waste
Product Quality	–
Business Sustainability	–
Position in the World Market	–
New Business Directions	–
International Cooperation	–
Environment Protection	–
Nuclear and Radiation Safety	–
Radiation Impact on Environment	–
RW and SNF Treatment, Rehabilitation of Contaminated Areas	–
Decommissioning of Nuclear Facilities	–
Innovative Activities	–
Reward	–
Demand for Qualified Staff	–
Investment Activities	–

RATIONALE FOR CHOOSING PRIORITY TOPIC OF THE REPORT

Based on the analysis of the Company's performance during the reporting period, the basic results and the key events the priority aspects of the Report has been formulated to be disclosed in the integrated Report 2018: New Businesses and Products of Rosatom TVEL Fuel Company.

STAKEHOLDER ENGAGEMENT

Stakeholders engagement is an integral element of public reports preparation and day-to-day activity of the Fuel Company. The Stakeholders Commission was established by the Company in 2013 to promote regular feedback on the matters pertaining to the activity of the Company and its public position on specific matters.

Stakeholders' suggestions were taken into account while preparing the Report, as well as the analysis of the best Russian and international practices of disclosure in annual reports. Details see in Section "Stakeholder Engagement".

Following the 2018 reporting campaign 13 suggestions of stakeholders were received: 5 of them have been taken into account while preparing the Report, 2 – partially considered, 3 – will be taken into account while preparing the next reports. The minutes of the respective dialogues are available on the website http://tvel.ru/wps/wcm/connect/tvel/tvelsite/finance/annual_report/dialog/

Reliability of the information contained in the Report has been confirmed by:

- The Statement of the Director for Internal Control and Audit of TVEL JSC (with respect to efficiency of the internal control system applicable to generation of the Report and compliance of generation procedures with requirements of law, internal regulations of Rosatom and TVEL JSC in the sphere of public reporting);
- The Statement of the audit organization Nexia Pacioli LLC, confirming the reliability of 2017 Financial Statement of TVEL JSC;
- The Statement of the audit organization confirming the reliability of non-financial data published in the Report.

The Organization that renders services of independent assurance of non-financial data of the Report was selected through competitive procurement practices.

The Report was approved by TVEL JSC Board of Directors.

This Report covers the year 2018. All prior and future periods are mentioned herein in description of corporate strategy, collation of performance indicators and results, forecasts and risk assessments. In addition to factual information, this Report describes and assesses potential and probable events. Any statements herein other than statement of facts shall be construed as forecasts. Forecasts of this kind are relevant only at the time of publishing. TVEL JSC (unless otherwise specifically provided for by applicable legislation) is not obliged to review or update the said forecasts or factors in any new pieces of information. Actual performance results may differ from the forecasted ones.

The Company appreciates the employees who took part in preparation of this Report, and all participants of public consultations and dialogues. We hope you will find this Report interesting and informative in terms of the new information about TVEL Fuel Company. Our working team is open to your feedback and suggestions on the matters and the issues that you would like to see in the next annual report. Feedback form is available in the interactive version of the Report on the site http://tvel.ru/wps/wcm/connect/tvel/tvelsite/finance/annual_report

TERMS AND DEFINITIONS

TERM	DEFINITION
Ash and Slag	Waste generated from solid fuel burning.
Becquerel (bq)	A unit of radionuclide activity in the radiation source, equal to nuclide activity where one nucleus decays per second
Burnup Fraction	Fraction of an initial quantity of a given nuclide that has undergone burnup in reactor under the neutrons influence
Business Model	According to the International Integrated Reporting Framework, business model is a system of transforming the capitals through business activity aiming to fulfil strategic purposes and create value over the short-, medium- and long term
Capital	According to the International Integrated Reporting Framework, resources and relations being the source and the results of value (integrated value) creation processes.
Circulating water	Water that has been used in the processing cycle, and after cooling or purification it is used for the same purposes.
Closed Nuclear Fuel Cycle	Nuclear fuel cycle where spent nuclear fuel is processed for uranium and plutonium extraction for nuclear fuel remanufacturing
Decommissioning	Decommissioning of a reactor facility and follow-up activity to ensure its safe dismantling, equipment disposal and further use of the site
Depleted Uranium	Uranium that contains less isotopes U-235 than natural uranium Uranium depleted through extraction of U-235, which is economically unfeasible to use; stored at a disposal site (dump)
Dump of Radioactive Material	Controlled entry of radionuclides into water bodies with liquid waste of a nuclear facility.
Enriched Nuclear Fuel	Nuclear fuel where the content of fissionable nuclides is higher than in natural raw material
Enriched Uranium	Uranium which contains more U-235 isotope than natural uranium Reactor quality uranium is usually enriched approximately to 3.5% U-235, and the content of U-235 in weapon-grade uranium is over 90%
Enrichment (isotopic)	a) the content of atoms of a certain isotope in the isotopic mixture of the same element, if this exceeds the share of the given isotope in a naturally occurring mixture (expressed as a percentage); b) process resulting in an increased content of a certain isotope in the isotopic mixture.
Fast Neutrons	Neutrons with kinetic energy higher than certain definite value. In Nuclear Reactor Physics fast neutrons are those with energies above 0.1 MeV
Financial Capital	According to the International Integrated Reporting Framework, the pool of funds that is: – available to an organization for use in the production of goods or the provision of services; – obtained through borrowings, equity or grants, or generated through operations or investments
Fuel Assembly	A package of fuel elements (rods, bars, plates and others) held together with the aid of spacer grids and other structural elements, which are integral during transportation and in-pile irradiation. Assemblies are loaded into the nuclear reactor core.
Fuel Pellet	A pellet of compacted uranium dioxide is the basis of nuclear fuel and is contained inside fuel elements.
Fuel Production	Nuclear fuel production, generally in the form of ceramic pellets enclosed in metal tubes (fuel elements), which are subsequently assembled in fuel assemblies (FA)
Fuel-Element Cladding	Metal tubes in the active zone of the reactor containing oxide fuel pellets
Gas Centrifuge	Equipment intended to obtaining enriched uranium required for operation of nuclear reactors of nuclear power plants
Gas Diffusion Technology	Gas-diffusion method for separating uranium isotopes, based on phenomenon of molecular diffusion through the micropores in a membrane (barrier)
Global Reporting Initiative, GRI	An international reporting system concerning economic, environmental and social performance, based on the Sustainability Reporting Standards
Heat Carrier	Liquid or gas used for heat transfer from the active zone of the reactor to steam generators or directly to the turbines
Human Capital	According to the International Integrated Reporting Framework, people's competencies, capabilities and experience, and their motivations, including: – alignment with and support for an organization's governance framework, risk management approach, and ethical values; – ability to understand, develop and implement an organization's strategy; – loyalties and motivations for improving processes, including their ability to lead, manage and collaborate
Indirect Energy Use (Consumption)	Indirect energy use (consumption) indicates the amount of energy required for production by the reporting company of the consumed or purchased externally (i.e. produced outside the company) electric energy, steam, heat energy and other types of intermediate energy.
Integrated Report	Integrated report represents brief overview that reveals how strategy, corporate management, activities and prospects in the context of the environment lead to value creation over the short, medium and long-term periods
Intellectual Capital	According to the International Integrated Reporting Framework, organizational knowledge-based intangibles
ISAE 3000 International Standard on Assurance Engagements	The Standard of the International Federation of Accountants "The performance of assurance engagements other than audits and reviews of historical financial information"
Manufactured Capital	According to the International Integrated Reporting Framework, manufactured physical objects (as distinct from natural physical objects) that are available to an organization for use in the production of goods or the provision of services, including: – buildings and structures; – equipment; – infrastructure
Maximum Permissible Dose	The maximum value of the individual equivalent radiation dose per year, which does not cause unfavorable changes in health after 50 years of uniform exposure
Natural Capital	According to the International Integrated Reporting Framework, these are: – renewable and non-renewable environmental resources and processes, including – air, water, land, minerals and forests, – biodiversity and eco-system health
Networking time	Working time minus time of scheduled breaks
Neutron	An elementary particle with no net electric charge; can be found in each atomic nucleus except for hydrogen. Single neutrons moving with different speeds are released during the fission reaction. Slow (thermal) neutrons, in their turn, can easily cause fission of nuclei of "fissionable" isotopes, e.g., U-235, Pu-239, U-233; fast neutrons can cause fission of "fertile" isotope nuclei, e.g. U-238. Sometimes atomic nuclei can capture neutrons
Nuclear Energy	Internal energy of atomic nuclei released by nuclear fission or nuclear reactions

TERM	DEFINITION
Nuclear Facility	Any facility that generates, processes or handles radioactive or fissionable materials
Nuclear Fuel	A material containing fissionable nuclides which, being placed in the nuclear reactor, makes it possible to sustain a nuclear chain reaction
Nuclear Fuel Cycle	The sequence of manufacturing processes for ensuring the operation of nuclear reactors from uranium production to the disposal of radioactive waste
Nuclear Fuel Depletion	Reduction of any nuclide concentration in nuclear fuel due to nuclear transformations of this nuclide during the reactor operation
Nuclear Power	Branch of power engineering that uses nuclear energy for electricity and heat supply purposes
Nuclear Reactor	A unit wherein a controlled chain nuclear reaction with energy release takes place. Reactors are classified according to their purpose, carrier type, design and other characteristics
Nuclear Waste	Radioactive materials generated on various stages of the nuclear fuel cycle, including development of uranium deposits, enrichment, fuel production, reactor operation, fuel processing, etc.
Nuclide	Type of atom with a definite number of protons and neutrons in the nucleus characterized by an atomic mass and atomic (order) number
Ozone-Depleting Substances	Any substance with an ozone-depleting potential higher than 0, that can deplete the stratospheric ozone layer. Most of ozone-depleting substances, including chlorofluorohydrocarbons, halons and methylbromide, fall under the Montreal protocol as amended
Phase Gate Approach to Investment	A principle of planning and carrying out investment activities applied to divide investment processes into phases, where each phase is preceded by Gate Review of the results achieved and the further project implementation plans and risk, and a decision is made on the further project implementation phase to be proceeded to
Power Unit	One of the NPP reactors with necessary additional equipment
Pre-test assembly program	A stage in the nuclear plant commissioning from the power start-up to the plant's acceptance for commercial operation
Primary Energy Sources	Initial form of energy used to satisfy energy requirements of the reporting organization. Examples of primary sources include non-renewable energy sources, e.g. coal, natural gas, oil and nuclear energy. They also include such renewable sources as biomass, sun and wind energy, geothermal and hydraulic energy
Radiation Monitoring	Acquisition of information on the radiological conditions in the organisation and in the environment and on human exposure levels (includes dose control and radiometric monitoring)
Radiation Safety	A set of arrangements seeking to limit the exposure of personnel and the public to the lowest possible radiation dose values in a socially acceptable way, as well as to avoid the early effects of exposure and keep the delayed radiation effects within tolerable limits
Radioactive Discharge	Radionuclide emission into the atmosphere resulting from operation of a nuclear facility
Radioactive Isotopes	Isotopes with unstable nuclei undergoing radioactive decay
Radioactive Waste	Nuclear materials and radioactive substances that no longer can be used
Radioactive Waste Processing	Technological operations aimed at altering the aggregative state and/or physic-chemical properties of radioactive waste and their transformation into forms suitable for transportation, storage and/or disposal
Radioactive Waste Treatment	General term that covers all activities related to the processing, conditioning, transportation, storage and burial of radioactive waste

TERM	DEFINITION
Radionuclide	General name for radioactive atoms. They pose a great danger to environment
Regenerated Uranium	Uranium separated from spent nuclear fuel in the process of radio-chemical reprocessing for repeated use in nuclear fuel (regenerated fuel)
Rehabilitation of Contaminated Areas	Reduction of the extent of radioactive contamination to the level ensuring the maximum protection of population and recovery of all elements of the ecosystem (water, soil, air) to the applicable normative level
Research Reactor	A nuclear reactor designed to be used as research object with a view to obtain data on reactor physics and technology required for design and development of a reactor of the same type or of components thereof
Social and Relationship Capital	According to the International Integrated Reporting Framework, – the institutions and the relationships within the Company and between the Company and different groups of stakeholders and other communities aimed to enhance collective well-being
Social Partnership	A system of institutes and mechanisms of coordination of the interests of the production process participants (workers, employers, state authorities, local self-government) based on equal cooperation
Spent Nuclear Fuel Reprocessing	A complex of chemical processes intended to remove fission products from spent nuclear fuel and fissile material recovery for reuse
Sublimation Production	Uranium hexafluoride production
Tailing Dump	Complex of special structures and equipment intended for storage or burial of radioactive, toxic and other tailing materials called tails
Top Management	Directors General, Deputies Director-General
Uranium Conversion	Chemical engineering process of uranium-containing materials transformation into uranium hexafluoride
Uranium Hexafluoride	A chemical compound of uranium and fluorine (UF_6). This is the only highly volatile uranium-fluorine compound (when heated to 53°C, uranium hexafluoride passes from solid into gas); it is used as raw material for separation of uranium-238 and uranium-235 isotopes using a gas-diffusion technology or a gas-centrifuge technology, and for production of enriched uranium
Uranium Ore Enrichment	Combination of processes for the primary treatment of uranium-bearing mineral raw material to separate uranium from other minerals contained in the ore. This does not involve any changes in the content of minerals, but only mechanical separation thereof with the resultant production of an ore concentrate
VVER	Water-water energetic reactor with water used as heat carrier and decelerator. The most common type of Russian NPP reactors has two modifications: VVER-440 and VVER-1000
Worker capacity	Share of networking time that the worker is doing operations according to technological process and current workplace management

ABBREVIATIONS

ABBREVIATION	DEFINITION
AFCF	Adjusted free cash flow
AMSIEM	Automated measuring system of industrial and ecological monitoring
ARMS	Automated radiation monitoring system
BN	Fast neutron reactor where the heat carrier within the first and second loop consists of sodium, while the third loop carries water and steam. In Russia is applied at Beloyarsk NPP
BWR	Boiling water reactor – a reactor that uses boiling water as heat carrier
CATU	Closed administrative and territorial unit
CD and ES	Civil defence and emergency situations
CFHC	Chlorofluorohydrocarbons
CFR	Center of Functional Responsibility
CRMS	Corporate risk management system
DB	Database
DIC&A	Director for Internal Control and Audit
EBITDA	Earnings before interest, taxes, depreciation and amortization – an analytical indicator, used to define a company's profit, before interest expenses, taxes, depreciation and amortization are subtracted
ECM	Electronic Computing Machines
EDEC	Experimental demonstration energy complex
EGP	Energy channel-type graphite reactor with steam overheat, used on Bilibino NPP
EMERCOM	The Ministry of the Russian Federation for Affairs of Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters
EMS	Emergency Management System (Facility Level)
FA	Fuel Assembly
FE NFC	Front end of nuclear fuel cycle
FE, FEG	Fuel element
FMBA	Federal Medical and Biological Agency
FSUE	Federal State Unitary Enterprise
FTP	Federal Target Program
GC	Gas Centrifuge
GCC	Gas Centrifuge Complex
GOST	State Standard

ABBREVIATION	DEFINITION
HM	Heavy metals
HPP	Heat and power plant
IAEA	International Atomic Energy Agency – international regulatory body that monitors nuclear safety performance and non-proliferation of nuclear weapons in the world
IAIEI	The Investment Activity Integrating Efficiency Indicator
IC	Information Center
ICS	Internal Control System
IFRS	International Financial Reporting Standards
IMS	Integrated Management System for Quality, Environment and Safety
INES	International Nuclear Event Scale
IT	Information Technologies
JSC	Joint Stock Company
KPI	Key performance indicators
LIC	Lithium-ion cells
LLC	Limited liability company
LTIFR	Lost time injury frequency rate – number of lost time incidents divided by total hours worked for the reporting year and rated as 1 mln man hours
MM	Mass media
MNUP	Mixed nitride uranium-plutonium
MOX-fuel	Mixed Oxide Nuclear Fuel (generally on basis of uranium and plutonium)
MPS	Managerial personnel reserve
MSE	Managers, specialists, employees
MW	Megawatt – unit of power equal to 106 watts. MW(e) – electric power of a generator; MW(t) – thermal power of a reactor or heat source (e.g., full thermal power of the reactor itself is generally three times higher than the electric power)
NF	Nuclear fuel
NFC	Nuclear fuel cycle, set of arrangements aimed at operation of nuclear power industry, including production and processing of uranium ore, fuel production, its transportation to NPP, storage and treatment of SNF. In case of SNF burial NFC is called opened, and if fuel reprocessing and repeated use are provided – it is called closed
NPF	Non-state pension fund
NPP	Nuclear power plant, industrial facility for electric power production
NRHF	Nuclear and radiation hazardous facilities

ABBREVIATION	DEFINITION
NRS	Nuclear radiation safety
PHWR	Pressurised heavy water reactor — foreign reactors with heavy water (D2O) as reactor coolant
PJSC	Public Joint Stock Company
PWR	Pressurized water reactor – type of foreign reactors with pressurized water, analogue of VVER reactor
R&D	Research and development
RBMK	High-power channel-type reactor — type of single-cycle energetic reactor with water as hear carrier, and graphite as decelerator.
RN	Radionuclide
RPS	Rosatom Production System
RR	Research Reactor
RRM/RF	RRM (regenerated raw material) — uranium hexafluoride obtained from regenerated fuel of industrial reactors
RF	Uranium hexafluoride obtained from irradiated fuel of NPP reactors
RU	Reactor unit
RUEI	Russian Union of Entrepreneurs and Industrialists
RUNPIW	Russian Union of Nuclear Power and Industry Workers
Russian-Kazakhstan Project ERC	Russian-Kazakhstan Project "Uranium Enrichment Center"
RW	Radioactive waste
SC	Subsidiary companies
SDIC	Special Department for Internal Control
SFI	Suggestions for improvement
SH	Stakeholders, parties concerned
SNF	Spent nuclear fuel
SPA	Scientific-production association
SRWS	Solid Radioactive Waste Storage
SSC	State Scientific Center
SSC	Separation and sublimation complex

ABBREVIATION	DEFINITION
STC	Scientific and Technical Council
SWU	Separative work unit
TASED	Territory of advancing social and economic development
TVEL FC TVEL Fuel Company	TVEL JSC and subsidiary companies included into the management system of the Company and consolidation framework used for the reporting
TVSA (FAAD)	Fuel assembly of alternative design
TVS-K	Name of fuel assembly for PWR reactors developed in Russia
UIPS	Uniform Industrial Procurement Standard of Rosatom State Corporation
VAT	Value added tax
VHI	Voluntary health insurance
VVER	Water-to-water energetic reactor

APPENDICES

1. AUDITOR'S REPORT

INDEPENDENT AUDITOR'S REPORT TO THE SHAREHOLDERS AND BOARD OF DIRECTORS OF JSC "TVEL"

OPINION

We have audited the financial statements of JSC "TVEL" (the Company), which comprise:

- Balance Sheet at December 31, 2018;
- Statement of profit or loss for the year ended December 31, 2018;
- Statement of changes in equity for the year ended December 31, 2018;
- Statement of cash flow for the year ended December 31, 2018;
- Notes to the financial statements for the year ended December 31, 2018.

In our opinion, the financial statements present fairly in all material respects, the financial position of JSC "TVEL" as at December 31, 2018, and its financial performance and its cash flows for the year then ended in accordance with Russian accounting standards.

BASIS FOR OPINION

We conducted our audit in accordance with International Standards on Auditing (ISAs). Our responsibilities under those standards are further described in the Auditor's Responsibilities section of our report. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the Russian Federation, and we have fulfilled our other responsibilities in accordance with these requirements and the IESBA Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Management is responsible for the preparation of the financial statements in accordance with Russian accounting standards and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error. In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so. Those charged with governance are responsible for overseeing the Company's financial reporting process.

AUDITOR'S RESPONSIBILITIES FOR THE AUDIT OF THE FINANCIAL STATEMENTS

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Assess the presentation of the financial statements as a whole, its structure and content, including disclosure, and whether the transactions and events of the financial statements are reported in such a way as to ensure their reliable performance.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Deputy of General director by audit
"Nexia Pacioli" LLC
State Registration Number 1027739428716
bld 2, Malaya Polyanka street, Moscow, 119180, Russia
A member of Self-regulated organization of auditors
Association "Sodruzhestvo"
Main registration
number 11606052374

March 11, 2019
Stamp

Общество с ограниченной ответственностью "Нексиа Пачоли" "Nexia Pacioli" 1027739428716 Москва

Olga Danilova

2. FINANCIAL STATEMENTS

BALANCE SHEET AS AT DECEMBER 31, 2018

			Codes		
		Form under OKUD	0710001		
		Date (day, month, year)	31	12	2018
Organization	Joint Stock Company "TVEL"	under OKPO	45046040		
Taxpayer Identification Number		TIN	7706123550		
Type of business	Production of nuclear fuel	under OKVED	24.46		
Form of incorporation / form of ownership			12267		16
Joint Stock Company		under OKOPF / OKFS			
Measurement unit:	in thous. RUB	under OKEI	384		
Location (address)	Bld. 24, Bolshaya Ordynka st., Moscow, 119017				

Comments	Index description	CODE	As on December 31, 2018	As on December 31, 2017	As on December 31, 2016
	ASSETS				
	I. NON-CURRENT ASSETS				
3.1, 3.2	Intangible assets	1110	962,989	1,099,385	1,055,754
3.2	Results of research and development	1120	1,624,104	1,115,609	470,339
	Intangible development assets	1130			
	Tangible development assets	1140			
3.3	Fixed assets	1150	128,950	170,416	154,397
	Buildings, vehicles, equipment etc.	1151	128,286	170,416	114,382
	Capital investments in progress	1152	664		40,015
	Advances to suppliers	1153			
	Income-bearing investments in tangibles	1160	414,716	414,716	416,554
3.5	Financial investments	1170	206,256,642	203,386,909	209,655,354
	Deferred tax assets	1180	5,361,597	5,207,194	4,042,626
	Other non-current assets	1190	1,727,567	3,080,489	3,310,529
	Total I	1100	**216,476,565**	**214,474,718**	**219,105,553**
	II. CURRENT ASSETS				
3.4	Stock	1210	55,234,352	59,866,941	68,750,309
	Raw, materials and other similar assets	1211	9,254,645	7,774,339	8,578,293
	Work in progress expenditures	1212	41,287,398	45,483,552	48,957,800
	Finished products and goods for resale	1213	4,179,596	6,592,606	11,214,216
	Shipped goods	1214	512,713	16,444	
	Other stock and expenses	1219			
	Value added tax on purchased assets	1220	116,400	3,492,685	8,575,202
3.7	Accounts receivable	1230	26,276,869	32,912,114	30,104,703
	Settlements with buyers and customers	1231	21,575,815	24,291,307	18,387,786
	Advances made	1232	1,519,333	2,129,997	611,518
	Other debtors	1233	3,181,721	6,490,810	11,105,399
	Unpresented for payment accrued revenue	1234			
3.5	Financial investments (excluding cash)	1240	81,870,447	71,473,277	27,797,237
3.6	Cash	1250	4,484,889	3,934,336	9,435,365
	Other current assets	1260	1,201,105	361,464	454,658
	Total II	1200	**169,184,062**	**172,040,817**	**145,117,474**
	BALANCE	**1600**	**385,660,627**	**386,515,535**	**364,223,027**
	LIABILITIES				
	III. CAPITAL AND RESERVES				
	Equity capital (pooled capital, collective capital, contribution of partners)	1310	22,962	22,962	22,962
	Own shares redeemed from shareholders	1320			
	Received contributions from stockholders to share capital before registration of changes in constituent documents	1330			
	Revaluation of non-current assets	1340			
	Additional capital (without revaluation)	1350	181,731,782	181,731,790	181,731,834
	Reserve capital	1360	826,057	522,402	258,255
3.14	Reserves formed in accordance with legislation	1361	824,909	521,254	257,107
	Reserves formed in accordance with founding documents	1362	1,148	1,148	1,148
	Undistributed profit (uncovered loss)	1370	107,139,621	110,095,198	97,246,595
	Total III	1300	**289,720,422**	**292,372,352**	**279,259,646**
	IV. LONG-TERM LIABILITIES				
	Borrowed funds	1410			
	Deferred tax liabilities	1420			
	Estimated liabilities	1430			
	Other liabilities	1450	1,008,906	2,450,963	1,429,164
	Total IV	1400	**1,008,906**	**2,450,963**	**1,429,164**
	V. SHORT-TERM LIABILITIES				
3.13	Borrowed funds	1510	56,062,540	50,140,638	40,181,112
3.10	Accounts payable	1520	37,716,596	40,584,170	42,507,215
	Suppliers and contractors	1521	23,766,803	26,847,061	25,586,785
	Advances received	1522	12,694,909	12,158,164	12,434,174
	Accounts payable to employees	1523	1,055	1,163	1,496
	Accounts payable to state non-budget bodies	1524	18,494		
	Accounts payable in respect of taxes and levies	1525	3,082	3,315	3,318
	Other creditors	1526	1,232,253	1,574,467	4,481,442
	Deferred income	1530	27,515	1,417	2,309
3.15	Estimated liabilities	1540	1,124,648	965,995	843,581
	Provisions	1546			
	Accounts payable to customers	1547			
	Other liabilities	1550			
	Total V	1500	**94,931,299**	**91,692,220**	**83,534,217**
	BALANCE	**1700**	**385,660,627**	**386,515,535**	**364,223,027**

Director (signature) **N.V. Nikipelova** (name)

"11" March 2019

Acting Chief accountant (signature) **M. N. Guseva** (name)

STATEMENT OF FINANCIAL RESULTS
JANUARY — DECEMBER 2018

			Codes		
		Form under OKUD	0710002		
		Date (day, month, year)	31	12	2018
Organization	Joint Stock Company "TVEL"	under OKPO	45046040		
Taxpayer Identification Number		TIN	7706123550		
Type of business	Production of nuclear fuel	under OKVED	24.46		
Form of incorporation / form of ownership			12267		16
Joint Stock Company		under OKOPF / OKFS			
Measurement unit:	in thous. RUB	under OKEI	384		

Comments	Index description	CODE	Over 12 months of 2018	Over 12 months of 2017
3.17	Proceeds, including	2110	129,373,912	145,024,699
	proceeds from sale of own products		110,221,940	125,159,028
	proceeds from carrying out work, rendering services		14,218,457	15,906,972
3.17	Prime cost of sales, including	2120	(90,931,770)	(92,972,461)
	prime cost of sales of own products		(74,857,564)	(79,127,989)
	prime cost of carrying out work, rendering services		(13,300,901)	(12,169,594)
	Gross profit (loss)	2100	38,442,143	52,052,238
3.17	Commercial expenses	2210	(1,345,763)	(1,112,599)
3.14, 3.17	Management expenses	2220	(8,938,779)	(9,189,894)
	Sales profit (loss)	2200	28,157,601	41,749,745
	Income from participation in other entities	2310	7,175,167	2,298,168
	Interest receivable	2320	5,706,583	5,431,588
	Interest payable	2330	(3,558,771)	(3,802,997)
3.18	Other income, including	2340	2,747,649	1,505,471
3.18	Other expenses, including	2350	(2,502,684)	(8,587,531)
	Income (loss) before tax	2300	37,725,545	38,594,444
3.16	Current profit tax	2410	(6,326,132)	(8,424,376)
	including permanent tax liabilities (assets)	2421	(62,357)	(150,500)
	Variation of deferred tax liabilities	2430	(102,555)	(129,509)
	Variation of deferred tax assets	2450	256,255	1,144,129
	Other	2460	5,890	145,804
	Redistribution of profit tax within consolidated group of taxpayers	2465	554,512	646,868
	Net profit (loss)	2400	32,113,515	31,977,360

Comments	Index description	CODE	Over 12 months of 2018	Over 12 months of 2017
	FOR REFERENCE ONLY Result of revaluation of non-current assets not to be included in net profit (loss) of the period	2510		
	Result of other operations not to be included in net profit (loss) of the period	2520	(8)	(44)
	Cumulative financial result for the period	2500	32,113,507	31,977,316
3.19	**For reference:** Basic earnings (loss) per share	2900	1,40	1,39
	Diluted earnings (loss) per share	2910		

Director (signature) **N.V. Nikipelova** (name)

"11" March 2019

Acting Chief accountant (signature) **M. N. Guseva** (name)

CAPITAL STATEMENT FOR THE YEAR 2018

			Codes		
		Form under OKUD	0710003		
		Date (day, month, year)	31	12	2018
Organization	Joint Stock Company "TVEL"	under OKPO	45046040		
Taxpayer Identification Number		TIN	7706123550		
Type of business	Production of nuclear fuel	under OKVED	24.46		
Form of incorporation / form of ownership			1 2267		16
Joint Stock Company		under OKOPF / OKFS			
Measurement unit:	in thous. RUB	under OKEI	384		

1. Flow of capital

Index description	Code	Equity capital	Own shares redeemed from shareholders	Share capital payment received from shareholders before registration of amendments in founding documents	Additional capital	Reserve capital	Undistributed profit (uncovered loss)	Total
Value of the capital as of December 31, 2016	3100	**22,962**			**181,731,834**	**258,255**	**97,246,595**	**279,259,646**
For the year 2017								
Increase of capital – total:	3210	–	–	–	376	5,989,145	31,977,360	37,966,881
including:								
net profit	3211	X	X	X	X	X	31,977,360	31,977,360
revaluation of property	3212	X	X	X		X		
income charged directly to increase of capital	3213	X	X		376	5,989,145		5,989,521
additional emission of shares	3214					X		–
increase in the par value of shares	3215					X		–
reorganization of the legal entity	3216							–
use of industry-based reserves for investment purposes	3217	X	X	X	X	X		–
share capital payment before registration of amendments in founding documents	3218	X	X		X	X	X	–
Reduction of the capital – total:	3220	–	–	–	(420)	(5,724,998)	(19,128,757)	(24,854,175)
including:								
loss	3221	X	X		X	X		–
revaluation of property	3222	X	X			X		–
expenses charged directly to reduction of the capital	3223	X	X		(420)	(5,724,998)		,(5,725,418)
decrease in the par value of shares	3224					X		
decrease in the number of shares	3225					X		–
reorganization of the legal entity	3226							–
dividends	3227	X	X		X	X	(19,128,757)	(19,128,757)
share capital payment before registration of amendments in founding documents	3228	X	X		X	X	X	–
Change in the additional capital	3230	X	X	X				X
Change in the reserve capital	3240	X	X	X	X			X
Value of the capital as on December 31, 2017	**3200**	**22,962**	**–**	**–**	**181,731,790**	**522,402**	**110,095,198**	**292,372,352**
For the year 2018								
Increase of the capital – total:	3310	–	–	–	96	5,251,478	32,113,515	37,365,089
including:								
net profit	3311	X	X	X	X	X	32,113,515	32,113,515
revaluation of property	3312	X	X	X		X		–
income charged directly to increase of capital	3313	X	X	X	96	5,251,478		5,251,574
additional emission of shares	3314					X		–
increase in the par value of shares	3315					X		–
reorganization of the legal entity	3316							–
use of industry-based reserves for investment purposes	3317	X	X	X	X	X		–

Index description	Code	Equity capital	Own shares redeemed from shareholders	Share capital payment received from shareholders before registration of amendments in founding documents	Additional capital	Reserve capital	Undistributed profit (uncovered loss)	Total
share capital payment before registration of amendments in founding documents	3318	X	X		X	X	X	–
Reduction of the capital – total:	3320	–	–	–	(105)	(4,947,822)	(35,069,092)	(40,017,019)
including:								
loss	3321	X	X		X	X		–
revaluation of property	3322	X	X			X		–
expenses charged directly to reduction of the capital	2223	X	X		(105)	(4,947,822)		(4,947,927)
decrease in the par value of shares	3324					X		
decrease in the number of shares	3325					X		–
reorganization of the legal entity	3326							–
dividends	3327	X	X		X	X	(35,069,092)	(35,069,092)
share capital payment before registration of amendments in founding documents	3328	X	X		X	X	X	–
Change in the additional capital	3330	X	X	X				X
Change in the reserve capital	3340	X	X	X	X			X
Liability on December 31, 2018	**3300**	**22,962**	**–**	**–**	**181,731,781**	**826,058**	**107,139,621**	**289,720,422**

2. Corrections due to change in the accounting policy and elimination of errors

Index description	Code	As of December 31, 2017	Changes in the capital for 2018		As of December 31, 2018
				based on other factors	
Capital — total					
before corrections	3400	–	–	–	–
correction due to:					
change in the accounting policy	3410	–	–	–	–
elimination of errors	3420	–	–	–	–
after corrections	3500				
including: undistributed profit (uncovered loss):					
before corrections	3401	–	–	–	–
correction due to:					
change in the accounting policy	3411	–	–	–	–
elimination of errors	3421	–	–	–	–
after corrections	3501	–	–	–	–
other capital items, where corrections were made:					
before corrections	3402	–	–	–	–
correction due to:					
change in the accounting policy	3412	–	–	–	–
elimination of errors	3422	–	–	–	–
after corrections	3502	–	–	–	–

3. Net assets

Net assets	3600	289,725,474	292,373,769	279,261,955

Director (signature) **N.V. Nikipelova** (name)

Acting Chief accountant (signature) **M. N. Guseva** (name)

"11" March 2019

CASH FLOW STATEMENT FOR THE YEAR 2018

			Codes		
		Form under OKUD	0710004		
		Date (day, month, year)	31	12	2018
Organization	Joint Stock Company "TVEL"	under OKPO	45046040		
Taxpayer Identification Number		TIN	7706123550		
Type of business	Production of nuclear fuel	under OKVED	24.46		
Form of incorporation / form of ownership			12267		16
Joint Stock Company		under OKOPF / OKFS			
Measurement unit:	in thous. RUB	under OKEI	384		

Index description	CODE	Over 12 months of 2018	Over 12 months of 2017
Cash flow associated with day-to-day operations			
Receipts – total	4110	140,046,257	147,868,698
including:			
from sale of products, goods, works and services	4111	131,893,063	138,058,600
from lease payments, license payments, royalty and other similar payments	4112	235,245	418,716
from re-sale of financial investments	4113	–	–
other receipts	4119	7,917,950	9,391,382
Payments – total	4120	(107,366,938)	(104,520,065)
including:			
to suppliers (contractors) for raw materials, materials, works, services	4121	(90,512,159)	(85,203,532)
associated with remuneration of employees labour	4122	(2,626,626)	(2,361,344)
interest on debt obligations	4123	(3,564,819)	(3,744,963)
corporate profit tax	4124	(5,021,264)	(6,752,835)
other payments	4129	(5,642,070)	(6,457,391)
Balance of cash flow associated with day-to-day operations	**4100**	**32,679,319**	**43,348,633**
Cash flow associated with investment activities			
Receipts – total	4210	144,833,103	101,394,000
including:			
from sale of non-current assets (except for financial investments)	4211	1,788	166,486
from sale of shares (participation shares) in other organizations	4212	–	71,118
from return of loans granted, from sale of debt securities (rights of funds claim from third parties)	4213	132,112,782	93,812,858
Dividends, interest from long-term financial investments and similar revenues from share interests in other companies	4214	12,718,534	7,343,539
other receipts	4219		
Payments – total	4220	(148,438,035)	(139,383,978)
including:			
associated with acquisition, creation, modernization, reconstruction and preparation for current assets operation	4221	(2,210,550)	(1,773,012)
associated with acquisition of shares (participation shares) in other organizations	4222	(3,722,900)	–
associated with acquisition of debt securities (rights of funds claim from third parties), loans provision to third parties	4223	(142,503,934)	(137,452,565)
interest on debt obligations included in the value of investment asset	4224	–	–
other payments	4229	(652)	(158,400)
Balance of cash flow associated with investment activities	**4200**	**(3,604,933)**	**(37,989,978)**

Index description	CODE	Over 12 months of 2018	Over 12 months of 2017
Cash flow associated with financial activities			
Receipts – total	4310	64,559,000	61,117,400
including:			
getting credits and loans	4311	64,559,000	61,117,400
owners' (participants') money deposits	4312	–	–
from issue of shares, increase in participation shares	4313	–	–
from issue of bonds, promissory notes and other debt securities and etc.	4314	–	–
budgetary provisions and other target financing	4315	–	–
other receipts	4319	–	–
Payments – total	4320	(93,702,124)	(71,644,157)
including:			
to owners (participants) due to repurchase their shares or their resignation	4321	–	–
for payment of dividends and other payments under distribution of profit in favour of owners (participats)	4322	(35,069,092)	(20,428,757)
associated with payment (repurchase) of promissory notes and other debt securities, repayment of credits and loans	4323	(58,631,050)	(51,215,400)
other payments	4329	(1,982)	–
Balance of cash flow associated with financial operations	**4300**	**(29,143,124)**	**(10,526,757)**
Balance of cash flow for the reporting period	**4400**	**(68,738)**	**(5,168,103)**
Balance of cash and cash equivalents as of reporting period beginning	**4450**	**3,934,336**	**9,435,365**
Balance of cash and cash equivalents as of reporting period end	**4500**	**4,484,889**	**3,934,336**
Effect of exchange rate changes to ruble	4490	619,290	(332,925)

Director (signature) **N.V. Nikipelova** (name)

"11" March 2019

Acting Chief accountant (signature) **M. N. Guseva** (name)

АКЦИОНЕРНОЕ ОБЩЕСТВО * ОГРН 1027739121475 * «ТВЭЛ» №1 * МОСКВА *

3. INTERNAL AUDIT CONCLUSION ON "PUBLIC ANNUAL REPORTING PREPARATION"

REPORT OF THE INTERNAL CONTROL AND AUDIT DEPARTMENT OF TVEL JSC FOLLOWING THE RESULTS OF "PUBLIC ANNUAL REPORTING PREPARATION" AUDIT PROCESS

The internal audit of the process of preparing the public annual report of TVEL JSC for 2018 was executed in compliance with the State Corporation Rosatom in the sphere of public reporting, the Uniform Industry Specific Guidelines on Execution of Public Reports in Rosatom and its organizations and document of the Company:

1. The order November 7, 2018 No. 4/495-П "Concerning preparation of Annual Report of TVEL JSC for 2018";

2. The order December 10, 2018 No. 4/557-П "On approval of the Concept of public Annual Report of TVEL JSC for 2018".

Formation of the public Annual Report of TVEL JSC was carried out in accordance with the international level of compliance established by the order of Rosatom State Corporation of July 18, 2017 No. 1/671-П.

The process of formation of the Company's Annual Report for 2018 complies with the requirements of the current laws of the Russian Federation, local regulatory acts of TVEL JSC in the sphere of public annual reporting, adequately reflects the performance of the Company from the standpoint of corporate annual reporting.

In the course of the audit by the unit of the Director for the internal control and audit, there were no facts of limiting the scope of the audit by the Company's management and employees.

The system of internal controls of the process of forming the public Annual Report of the Company is adequate and formalized. TVEL JSC held all the necessary dialogues with stakeholders.

Director for Internal Control and Audit, CIA **N.V. Belykh**

4. INDEPENDENT ASSURANCE REPORT ON JOINT-STOCK COMPANY TVEL ANNUAL REPORT 2018 [TRANSLATION FROM RUSSIAN ORIGINAL]

TO THE MANAGEMENT OF JOINT-STOCK COMPANY TVEL

We have undertaken a limited assurance engagement of nature and level of Joint-Stock company TVEL (hereinafter referred to as TVEL JSC) compliance with the principles of the AA1000 Accountability Principle (2018) (hereinafter referred to as AA1000 AP 2018) in the process of stakeholder engagement in sustainability activities, compliance of the accompanying integrated annual report of TVEL JSC for 2018 (hereinafter referred to as the Report) preparation process with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting as well as compliance of Report with the requirements of GRI Sustainability Reporting Standards to the report prepared in accordance with the Comprehensive option and with the requirements of the International Integrated Reporting Framework.

RESPONSIBILITY OF TVEL JSC

TVEL JSC is responsible for its compliance with the principles of the AA1000 AP 2018 in the process of stakeholder engagement in sustainability activities, for compliance of the Report preparation process with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting as well as preparation of the Report in compliance with the requirements of GRI Sustainability Reporting Standards to the report prepared in accordance with the Comprehensive option and with the requirements of the International Integrated Reporting Framework. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of the Report that is free from material misstatement, whether due to fraud or error.

OUR INDEPENDENCE AND QUALITY CONTROL

We have complied with the independence and other ethical requirements of the Rules of Independence of the Auditors and Audit Organizations and The Code of Professional Ethics of the Auditors, which are in accordance with Code of Ethics for Professional Accountants issued by the International Ethics Standards

Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior, and we have fulfilled our other ethical responsibilities in accordance with these requirements

The firm applies International Standard on Quality Control 1, Quality Control for Firm that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

OUR RESPONSIBILITY

Our responsibility is to express a limited assurance conclusion on nature and level of TVEL JSC compliance with the principles of the AA1000 AP 2018 in the process of stakeholder engagement in sustainability activities as well as compliance of the Report with the requirements of GRI Sustainability Reporting Standards to the report prepared in accordance with the Comprehensive option and with the requirements of the International Integrated Reporting Framework based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements 3000 (Revised), Assurance Engagements Other

TRANSLATION NOTE: Our report has been prepared in Russian. In all matters of interpretation of information, views or opinions, our original report in Russian takes precedence over this translation from Russian into English.

than Audits or Reviews of Historical Financial Information, as well as in accordance with AA1000 Assurance Standard 2008 (type 2, as defined by AA1000AS 2008). These standards require that we plan and perform this engagement to obtain limited (moderate as defined by AA1000AS 2008) assurance about whether TVEL JSC complies with the principles of the AA1000 AP 2018 in the process of stakeholder engagement in sustainability activities, whether the Report preparation process complies with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting and whether the Report is free from material misstatement.

A limited assurance engagement undertaken in accordance with these standards involves assessing the following criteria (hereinafter referred to as Criteria):

- Nature and level of TVEL JSC compliance with the principles of the AA1000 Accountability Principle 2018 – inclusivity, materiality, responsiveness and impact – in the process of stakeholder engagement in sustainability activities;
- Compliance of the Report preparation process with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting;
- Compliance of the Report with the requirements of GRI Sustainability Reporting Standards to the report prepared in accordance with the Comprehensive option;
- Compliance of the Report with the requirements of the International Integrated Reporting Framework.

A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

The procedures we performed were based on our professional judgment and included inquiries, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

Given the circumstances of the engagement, in performing the procedures listed above we have performed the following procedures:

- Study and selective testing of systems and processes implemented by TVEL JSC to ensure and analyze the compliance of the activities with the AA1000 AP 2018 principles; collection of evidence confirming practical implementation of these principles.
- Study and selective testing of systems and processes implemented by TVEL JSC to ensure the compliance of the Report preparation process with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting; collection of evidence confirming compliance with the regulatory requirements of State Corporation "Rosatom".
- Interviewing the management and employees of TVEL JSC and obtaining documentary evidence.
- Participation in public dialogues with stakeholders and consultations with stakeholders as well as the analysis of protocols of the specified events.
- Study of information available on the websites of TVEL JSC and its subsidiaries related to their activities in the context of sustainable development.
- Study of public statements of third parties concerning economic, environmental and social aspects of TVEL JSC and its subsidiaries activities, in order to check validity of the declarations made in the Report.
- Analysis of non-financial reports of companies working in the similar market segment for benchmarking purposes.
- Analysis of the current system of internal audit of non-financial reporting in TVEL JSC.
- Selective review of documents and data on the efficiency of the management systems of economic, environmental and social aspects of sustainable development in TVEL JSC.
- Study of the existing processes of collection, processing, documenting, verification, analysis and selection of data to be included into the Report.
- Analysis of information in the Report for compliance with the requirements of Criteria.

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The procedures were performed only in relation to data for the year ended 31 December 2018.

The evaluation of reliability of the information on performance in the Report was conducted in relation to compliance with the requirements of Standards to the report prepared in accordance with the Comprehensive option and information referred to in the annex to the Report "GRI Standards" as well as in relation to compliance with the requirements of the International Integrated Reporting Framework. In respect to the quantitative performance indicators the conformity assessment to external and internal reporting documents provided to us was performed.

The procedures were not performed in relation to forward-looking statements; statements expressing the opinions, beliefs and intentions of TVEL JSC to take any action relating to the future; as well as statements based on expert opinion.

The procedures were performed in relation to the Russian version of the Report, which includes information to be published in a hard-copy form as well as in digital form on the TVEL JSC website.

We had no chance to verify that the Report was published on the TVEL JSC website as well as that Global Reporting Initiative was notified of the use of the Standards in the Report preparation, due to the fact that the date of signing this Assurance Report preceded the planned dates of these procedures completion.

We had no chance to verify that TVEL JSC has received the certificate of public endorsement of the Report by Non-Financial Reporting Council of the Russian Union of Industrialists and Entrepreneurs due to the fact that the date of signing this Assurance Report preceded the planned date of the procedure completion.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express a reasonable assurance opinion about TVEL JSC adherence to the principles of the AA1000 AP 2018 as well as about compliance of the Report, in all material respects, with the Criteria.

LIMITED ASSURANCE CONCLUSION

Nature and extent of compliance of TVEL JSC with AA1000 AP 2018 principles

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes as to believe that TVEL JSC stakeholder engagement in sustainability activities has not complied, in all material aspects, with the criteria of AA1000 AP 20018 in respect to adherence of TVEL JSC to the principles (Inclusivity, Materiality, Responsiveness and Impact).

Compliance of the Report preparation process with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes us to believe that the Report preparation process has not complied, in all material aspects, with the regulatory requirements of State Corporation "Rosatom" in the sphere of public reporting.

Compliance of the Report with the GRI Sustainability Reporting Standards (Comprehensive option)

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes us to believe that the Report has not complied, in all material aspects, with requirements of GRI Sustainability Reporting Standards to the report prepared in accordance with the Comprehensive option.

Compliance of the Report with the requirements of the International Integrated Reporting Framework

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes as to believe that the Report has not complied, in all material aspects, with the guiding principles of the International Integrated Reporting Framework and with requirements to the structure of content elements of integrated reports.

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Recommendations

Based on the results of the limited assurance engagement we recommend:

- Disclose in more detail in the Report the methodology for identification the boundaries for the material topics.
- It is reasonable to disclose GRI indicators in relation to target values.
- Increase the extent of disclosure of indicators in relation to which requirements of GRI Standards is not fully taken into account (disclosures with omissions). In case of disclosure with omissions due to absence of a recording system, provide more specific information about plans to obtain data in future.
- Extend disclosure of information on how the organization evaluates the management approach to all material topics.

The recommendations are not intended to detract from the practitioner's conclusion. Our conclusion is not modified in respect of the matters referred to in the recommendations.

FBK, LLC
Practitioner
Partner
acting under Power of Attorney No. 76/18 of December 17, 2018
The Russian Federation, Moscow, June 28, 2019

V.Y.Skobarev

TRANSLATION NOTE: Our report has been prepared in Russian. In all matters of interpretation of information, views or opinions, our original report in Russian takes precedence over this translation from Russian into English.

5. STATEMENT ON PUBLIC ASSURANCE

STATEMENT ON PUBLIC ASSURANCE OF THE JSC "TVEL" REPORT FOR 2018

INTRODUCTION

JSC Fuel Company (hereinafter "the Company") management contacted us with an offer to assure the 2018 Annual Report of the Company (hereinafter "the Report") in terms of completeness and materiality of information disclosed therein, and to assess the performance of Company's management in response to recommendations and remarks of stakeholders. We were provided with the possibility to take part in off-site dialogue concerning the Report's concept (December 2018), dialogue on the priority topic (February 2019) and public consultations on the draft of the Report (April 2019). We also took part in the process of actualization of priority topics to be disclosed in the Report.

DRAFT REPORT EVALUATION PROCEDURE

We hereby confirm that we are acting independently and undertake to be objective in our evaluation, thereby expressing our personal expert opinion rather than the opinion of organizations we represent.

Our conclusion is based on the study of the final version of the Report and the analysis of information obtained in the course of dialogues and public consultations, in which we and our representatives participated and were allowed to freely express our opinion on the matters under discussion.

We are not aware of any facts that compromise reliability of data set forth in this Report. However, checking of the data collection system and verification of reliability and completeness of information is not the subject matter of public assurance.

No remuneration has been received from TVEL FC for our efforts and time invested in this project.

The results of our work are formalized in this Statement on Public Assurance wherein the opinions we all agreed upon are presented.

COMPLETENESS AND MATERIALITY OF INFORMATION

The Report contains relevant information that is sufficiently complete for proper understanding of the current state and prospects of the Company.

The Report covers topics that are material for stakeholders. Materiality assessment procedure used by the Company, based on GRI Standards requirements, made it possible to take into account opinions of all stakeholder groups.

According to our reckoning there are no reasons for doubt concerning the reliability and relevance of topics prioritization results.

COMPANY'S RESPONSE TO COMMENTS AND RECOMMENDATIONS OF STAKEHOLDERS

The Company consistently proceeds with serious work on providing wide audience for the dialogues and in the course of preparation of this Report traditionally demonstrated its willingness to conduct open communication with stakeholders on various aspects of its activities.

The Company has duly noted recommendations of the stakeholders received during dialogues and public consultations, conducted their analysis and used most of them in the final version of the Report. Moreover, the Company carried out several obligation that were taken in the previous reporting campaigns, thus the Reports transparency and information value were increased.

ASSESSMENT, COMMENTS AND RECOMMENDATIONS

We all share positive opinion about the Report – its form and the information disclosed. The Company has prepared an informative and well-structured document that meets our expectations.

We note that the Company is focused on following advanced Russian and international standards on corporate reporting. In the first place these are GRI Standards on sustainability reporting (an outstanding feature of the Company is the application of the comprehensive option).

In our opinion, the Company adheres to a consistent approach in increasing the transparency and accountability of its activities. The priority topic of this Report is defined as "New Businesses and Products of Rosatom TVEL Fuel Company." Based on the competencies of the development of nuclear production, the Company solves the priority task of Rosatom, set before the nuclear industry enterprises – the development of non-nuclear business areas. In the Report, TVEL Fuel Company demonstrated the results of its activities to develop the second business core, as well as constructive interaction with partners outside the contour of TVEL JSC in the regions where the Company's enterprises are located.

In our opinion, the Report comprehensively disclosures information on all key aspects of the Company's activities. The business model was refined, the strategy was described in detail, the contribution of the reporting year in its implementation, and factors for the long-term sustainability of the Company are given.

We are confident that the Company will consistently pursue commitments and plans, disclosed in this Report, and will preserve the high quality of stakeholder engagement.

Executive Director of the Association of Closed Administrative Territorial Unit for Nuclear Industry — A.I. Makarenko

Deputy Chairman of RUNPIW — Y.V. Borisov

Deputy Director General of Federation of Employers of the Russian Nuclear Industry — V.V. Serebryakov

Head of Project Department of the Nuclear Fuel Life Cycle Rosatom State Corporation — O.I. Linyaev

Advisor to Director General, TENEX JSC — V.N. Govorukhin

Head of Communications Department, Rosenergoatom JSC — A.V. Timonov

Candidate of technical sciences, Honored Worker of the Russian Water Industry, Director of "Consulting Institute of ecological projects", Member of Public Council of Rosatom State Corporation — N.G. Davydova

Executive Director of Interregional Public Ecological Organization "GREENLIGHT" — O.V. Plyamina

Director General of the Institute of Natural Monopolies Issues — Yu.Z. Saakyan

6. RUIE PUBLIC ENDORSEMENT OF THE REPORT

RSPP

Russian Union of Industrialists and Entrepreneurs

CERTIFICATE

of Public Endorsement
of a Corporate Non-Financial Report

TVEL Fuel Company
ANNUAL REPORT 2018

has received public endorsement
by the RSPP Council on Non-Financial Reporting

A detailed opinion of the RSPP Council regarding public endorsement of the annual report 2018 of the TVEL Fuel Company has been sent to the Company, which may publish it without amendment and use it both for corporate purposes and for the purposes of stakeholder engagement.

Registration number 141.04.102.02.18

RSPP President A. Shokhin

Moscow, 2019

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7. TABLE OF CONSIDERATIONS BY THE STAKEHOLDERS

No.	SUGGESTIONS BY STAKEHOLDERS TO THE INFORMATION TO BE DISCLOSED IN THE REPORT	RESPONSE BY TVEL FUEL COMPANY
1	To present a map of new products, similarly to the public report of Rosatom State Corporation – possibly, a systematization of consumers or cities of presence of TVEL Fuel Company's enterprises.	Considered in "Second Core and New Businesses" section.
2	To pay more attention to evaluation of the activities on social development and creation of new jobs.	Considered in "Social and Relationship Capital" section.
3	To disclose apart from the indicators for 2016–2018, also planned target indicators up to 2030–2035 on new businesses in the Annual Report.	Development of new businesses is linked to the current goals and plans for the coming period. Changing market conditions and the need to counter economic risks are also taken into account; therefore, the amount of R&D funding for the second core, as well as the target indicators plan change annually.
4	To present the contribution of TVEL Fuel Company to the achievement of the UN Sustainable Development Goals in more detail.	TVEL Fuel Company announces the adherence to the globally accepted initiative, and identifies the most relevant SDGs for its activities. At the moment, the Company works on the alignment by the Company to the Sustainable Development Goals within specific objectives with the results of its activities.
5	To adjust the structure of "Environmental Impact" section in a logical order.	The possibility of disclosure in future reports will be considered since the concept of the present report was approved in December 2018.
6	To disclose objective figures in the field of creating new jobs in the enterprises of TVEL Fuel Company.	Partially taken into account in the report.
7	To add the information on the project to achieve zero nuclear fuel failure.	Considered in "Innovative Activities in the Nuclear Industry" section.
8	To pay more attention to comments on the dynamics of indicators in the form of explanations of the reasons for their changes.	Taken into account in the report.
9	To add own definition of sustainable development.	Considered in "Business Model" section.
10	To add scheduled activities in the section on combating corruption for the future periods.	The possibility of disclosing this information in the next reports will be considered.
11	To carry out analytics on the reasons of safety violations in the section on occupational health and industrial safety in order to justify the plans of programs to combat these violations at production site.	The possibility of disclosing this information in the next reports will be considered.
12	To add to the report the information about foreign partners and the specifics of working with them.	Not taken into account
13	To add more information on removal of nuclear legacy.	Considered in "Nuclear and Radiation Safety Assurance" section.

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CONTACT DETAILS

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