

2018

Annual Report 2018



Step into Digital World

Approved by the Resolution
of the Board of Directors
of Rosenergoatom JSC

dated May 27, 2019.
Minutes No. 482

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Appendices are given in the online version of the Report
report2018.rosenergoatom.ru

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Business Geography

204.3 bln kWh produced in 2018
30.1 GW installed capacity of NPPs

- 37** operating power units
- 18,7%** – percent share in the Russian Federation energy balance
- 10 regions** of operating

- In operation
- Physical start-up in 2018
- Decommissioning
- Under shutdown

Smolensk NPP

●●● RBMK-1000



Leningrad NPP

●●●● RBMK-1000
⊕ VVER-1200



Kola NPP

●●●● VVER-440



Beloyarsk NPP

● BN-600 ● AMB-100
● BN-800 ● AMB-200



Bilibino NPP

●●●● EGP-6



Rostov NPP

●●●⊕ VVER – 1000



Novovoronezh NPP

●● VVER-440 ● VVER-210
● VVER-1000 ● VVER-365
● VVER-1200



Kursk NPP

●●●● RBMK-1000



Kalinin NPP

●●●● VVER-1000



Balakovo NPP

●●●● VVER-1000



102-7 Key Indicators of Rosenergoatom Activities in 2016–2018

Indicators	Actual 2018	Plan 2018	2017	2016
 Power generation, bln kWh	204.3	201.33	202.87	196.4
 Capacity factor, %	79.9 ¹	80.7	83.3	83.1
 Revenue, mln rubles	389,076	373,094	360,386	282,036
 Aggregate amount of main taxes accrued to budgets (amount of taxes paid minus tax refunds from budgets), mln rubles:				
Federal budget	27,643 ³	16,615	14,878	8,203
Budgets of the Russian Federation constituent entities	16,170	110	13,387	9,264
Local budgets	79 ⁴	14,968	63	56
Personal income tax	4,855	4,880	4,519	4,463
 In addition, transferred in favor of Atomenergoprom – a responsible participant in the consolidated group of taxpayers for the purpose of profit tax payment	13,833 ⁵	8,147	9,375	6,891
 Net profit, mln rubles	39,687 ⁶	9,085	45,981	10,605

Indicators	Actual 2018	Plan 2018	2017	2016
 Net asset value, mln rubles	1,609,244	1,559,818	1,509,615	1,389,225
 Gross profit, mln rubles	156,479	135,528	152,730	105,583
 Charitable contributions, mln rubles	650 ⁷	505,5	505	498
 EBITDA margin, %	43.3	36.1	46.7	41.0
 Investments in equity, mln rubles	118,187.3	120,069.11	115,097.0	128,975.1
 Average headcount, pers.	33,923.5	34,174	33,886	35,394
 Labor productivity, thousand rubles/pers.	11.5	10.9	10.64	7.97
 Number of accidents above INES Level 1	0	–	0	0
 LTIFR ⁸	0.03	–	0.05	0.065

1 Among the reasons for a decrease in the capacity factor versus the planned level are: longer repairs of the Belayarsk NPP unit No. 4, the Kursk NPP units No. 1, 2 and 3, scheduled overhaul of the Novovoronezh NPP unit No. 4 for its life extension.
2 Deviation of the actual income tax value from the planned one was primarily caused by better financial results of the Company.
3 Among the main reasons of the increase in the actual payments are: higher sales proceeds, changes in tax legislation related to budget subsidies (investments), transfer of some purchases from Q1-Q3 2018 to Q4 2018.
4 A decrease in actual payments was primarily caused by changes in cadaster values of land plots attributable to some branches.

5 Deviations from the planned level were primarily caused by better financial results of the Company.
6 Clarifications of the reasons for a decrease in the net profit versus 2017 are given in Section 4.2.
7 Deviations in the actual values versus the plan were caused by allocation of additional funds as provisions for unscheduled requests and operations of the Solovki Archipelago Development Foundation.
8 Lost Time Injury Frequency Rate.

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Keynote Addresses by Top Executives

Address by Board of Directors Chairman



Alexander Lokshin,
Chairman of the Board of Directors,
Rosenergoatom JSC,
First Deputy CEO for Operations
Management, Rosatom State
Corporation

Dear colleagues,

Rosenergoatom being part of the Power Engineering Division of Rosatom State Corporation generally succeeded in reaching the goals set in 2018. The government-set objectives were 100 percent achieved, including those related to power generation: while maintaining unconditional safety, the Company's nuclear power plants produced 204.3 bln kWh and hit another all-time record in terms of domestic power output. The Company's revenues in the reporting year also surpassed the previous year level by 8%.

One of the main results of the year was successful achievement of the government-set objectives of new power units commissioning: the Rostov NPP unit № 4 and the Leningrad NPP unit № 1 were commissioned ahead of schedule.

At present, active construction of power units with VVER-1200 and VVER-TOI reactors, as well as the Academician Lomonosov floating nuclear power plant is underway. We completed all operations scheduled in the reporting year as part of the innovative floating power unit construction: it was successfully

transferred to Murmansk, comprehensive testing of the nuclear power plant started on time, construction of onshore infrastructure facilities and hydraulic engineering structures continued in Pevek.

VVER reactor technologies lay the basis for the commercial offer of Rosatom State Corporation in construction of nuclear power plant units abroad, therefore scrupulous compliance with deadlines and cost control at Russian NPPs under construction underpins national energy safety and Rosatom success in the global market.

The nuclear industry in general and Rosenergoatom in particular face the strategic challenge of increasing the efficiency of power units construction operations. Digital transformation of the nuclear industry, inter alia, becomes an efficient tool in this and other sectors of our activities.

No less important are the challenges faced by Rosenergoatom in decommissioning of nuclear power units with expired service life. In 2018, the Bilibino NPP unit № 1 and the Leningrad NPP unit № 1 were finally shut down, which shapes a range of complex



>220 bln kWh

planned power output level by 2030

science-based tasks requiring the use of the competencies of Rosenergoatom as well as the whole nuclear power industry of Russia. The accumulated experience in this area is demanded domestically and abroad, and it becomes a new business line of Rosatom State Corporation.

Over the long run, in pursuance of the strategic objectives set by Rosatom State Corporation, Rosenergoatom faces the major challenges of a gradual increase in the power output level above 220 bln kWh¹ by 2030, a decrease in new power units construction time and cost

per unit, and a three times increase in the proceeds from new products. These objectives feature a high importance status, and Rosenergoatom possesses all the required resources and competencies for their successful completion.

One of the main results of the year was successful achievement of the government-set objectives of new power units commissioning: the Rostov NPP unit No. 4 and the Leningrad NPP unit No. 1 were commissioned ahead of schedule.

* In accordance with the General Allocation Pattern of Power Industry Facilities until 2035, the Russian Federation Government Resolution No. 1209-r dated June 9, 2017.

Address by CEO



Andrey Petrov,
CEO, Rosenergoatom JSC

Dear colleagues and partners,

This integrated annual report of "Rosenergoatom" Joint-Stock Company (hereinafter – the Company) prepared in compliance with the Global Reporting Initiative Standards (GRI Standards) and the International Reporting Standard of the International Integrated Reporting Council (IIRC) traditionally summarizes the results of the Company's activities in 2018 and embraces the areas of our development in the short, medium and long term.

One of the highlights of the year was a corporate OSART* mission held by the IAEA. We had been getting ready for it for over two years. The corporate mission unprecedentedly evaluating Rosenergoatom as a whole was focused on a checkup of the operating company's compliance with the IAEA safety requirements.

Following the results of the mission, international experts noted that the Company demonstrates real commitment to safety principles. The OSART mission for us became not only evaluation of the present-day status, but it shaped the vision of our future development. Moreover, advancement of the safety culture becomes the Company's main tool for boosting the overall efficiency. This is the logic we

use for consideration of all results of our activities and the objectives following the results of the OSART mission.

In terms of production, year 2018 was busy for the Company. The government-set objective related to power generation was successfully achieved: Russian nuclear plants produced 204.3 bln kWh having surpassed the record of 2017 by more than 1.4 bln kWh. The Russian FAS balance target was completed by 101.5% (201.3 bln kWh planned). Thus, the Russian nuclear power industry approached the absolute record of over 212 bln kWh achieved by the Soviet Union NPPs in 1989.

The Company's proceeds from power and capacity sales in 2018 versus the previous year grew by 8% to 389.1 bln rubles. The power output and revenue growth hinged on commissioning of new power units and boosting of the operational efficiency, including optimization of the repair campaign timeframes.

Two power units were commissioned in the reporting year: the Rostov NPP unit No. 4 with VVER-1000 reactor being the last one of a series of one thousand MW units, and the Leningrad NPP-2 unit No. 1 with an innovative next-generation VVER-1200 reactor. Construction of new nuclear power plant units was underway: the Academician Lomonosov

⚡ 204.3 bln kWh
Russian nuclear plants produced

⚡ >1.4 bln kWh
increase in the electricity output, if compared to the level of 2017

floating power unit start-up operations were carried out in Murmansk, the Kursk NPP-2 units construction entered an active phase, the Novovoronezh NPP-2 unit No. 2 was prepared for VVER-1200 reactor start-up.

Repair timeframes were optimized by 50 days in 2018, additional output resulting from the optimization, including implementation of the Rosatom Production System, exceeded 2 bln kWh.

Among other achievements of the year was successful annealing of the high-power reactor vessel of VVER-1000 at the Balakovo NPP for its life extension.

At the same time, year 2018 became a milestone for long-service power plants: the Leningrad NPP unit No. 1 with RBMK-1000 reactor and the Bilibino NPP unit No. 1 with

EGP-6 reactor were finally shut down for further decommissioning. This brings the Company and the whole nuclear industry to new technological challenges, and in facing these challenges we will gain new competencies that can be widely demanded by our foreign partners, among others.

A huge potential of the nuclear power industry in meeting the Earth's growing demand for safe energy, contribution to greenhouse gas emissions reduction, modern infrastructure development and creation of a comfortable urban living environment allow us to consider the nuclear power industry one of the most science-driven and high-tech industries of the present-day economy. The Company's technological leadership is based on the active digital transformation process, development and implementation of state-of-the-art innovative solutions.

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* The IAEA Operating Safety Analysis Review Team. OSART missions aim to improve the operational safety of NPPs and operating organizations through exchange of the experience gained in operations worldwide.

102-10 Key Events of 2018-2019

01 2018

January 19

Power start-up of the Rostov NPP power unit No. 4.

January 20

The Leningrad NPP demonstrated a record high power output of 1 trillion kWh among domestic nuclear plants.

January

A favorable expert opinion of Russia's Glavgosexpertiza was received after review of the project for construction of a floating nuclear power plant (FNPP) in Pevek.

02 2018

February 21

Power start-up of the Leningrad NPP-2 power unit No. 1 with VVER-1200 reactor.

03 2018

March

With participation of Rusatom Service, the Company has made the first contract with a foreign customer for provision of services related to the country's nuclear industry-specific regulatory framework improvement (with the Belarus NPP under construction and the Armenia NPP).

04 2018

April 29

General construction work started at the Kursk NPP-2 construction site.

April 28 – May 19

Transportation of the Academician Lomonosov floating power unit from Saint Petersburg to Atomflot premises in Murmansk.

09 2018

**September 21**

Presentation of Russia's largest DPC Stage 1 in Tver Oblast. The DPC is a pilot node of the Mendeleev project network.

September 28

A new power unit No. 4 (VVER-1000) of the Rostov NPP was put into commercial operation.

10 2018

October 2

Nuclear fuel loading into reactor systems was completed at the FNPP.

October 24

A new power unit No. 1 (VVER-1200) of the Leningrad NPP-2 was put into commercial operation.

11 2018

**November 11-27**

Rosenergoatom hosted the Corporate Mission of the IAEA Operating Safety Review Team for the first time ever.

November

As part of the scheduled repair, the Balakovo NPP power unit No. 1 successfully passed a large-scale process of the VVER-1000 reactor vessel's recovery annealing.

12 2018

December 6

Power was started up at the Academician Lomonosov floating power unit.

December 21

The Leningrad NPP power unit No. 1 (RBMK-1000) was shut down for decommissioning.

**December 29**

The Digitalization Program for Power Engineering Division of Rosatom for 2018-2022 was approved and enacted.

**December**

Rosenergoatom, Energynet and North-West Center for Strategic Research entered into a cooperation agreement for development of a digital (smart) power industry in Russia.

01 2019

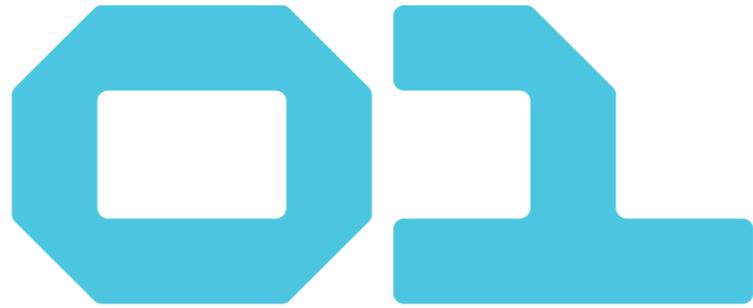
January 14

Rostekhnadzor issued a 15-year license to Rosenergoatom for the Bilibino NPP power unit No. 1 operation in a no-power mode. The power unit had previously been shut down for decommissioning.

02 2019

February 19

First criticality was attained at the Novovoronezh NPP-2 power unit No. 2 (VVER-1200 reactor).



Overview

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1.5. Situation in Electric Power Industry	28

Rosenergoatom, Joint-Stock Company (herein-after – the Company or Rosenergoatom) is one of the largest single-product players on the Russian power market

1.1. General Information

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102-2

The core businesses of Rosenergoatom are generation of power and heat by its nuclear plants, and operation of nuclear plants, sources of radiation, nuclear material and radioactive substance storage sites pursuant to the procedure set forth by the Russian Federation laws.

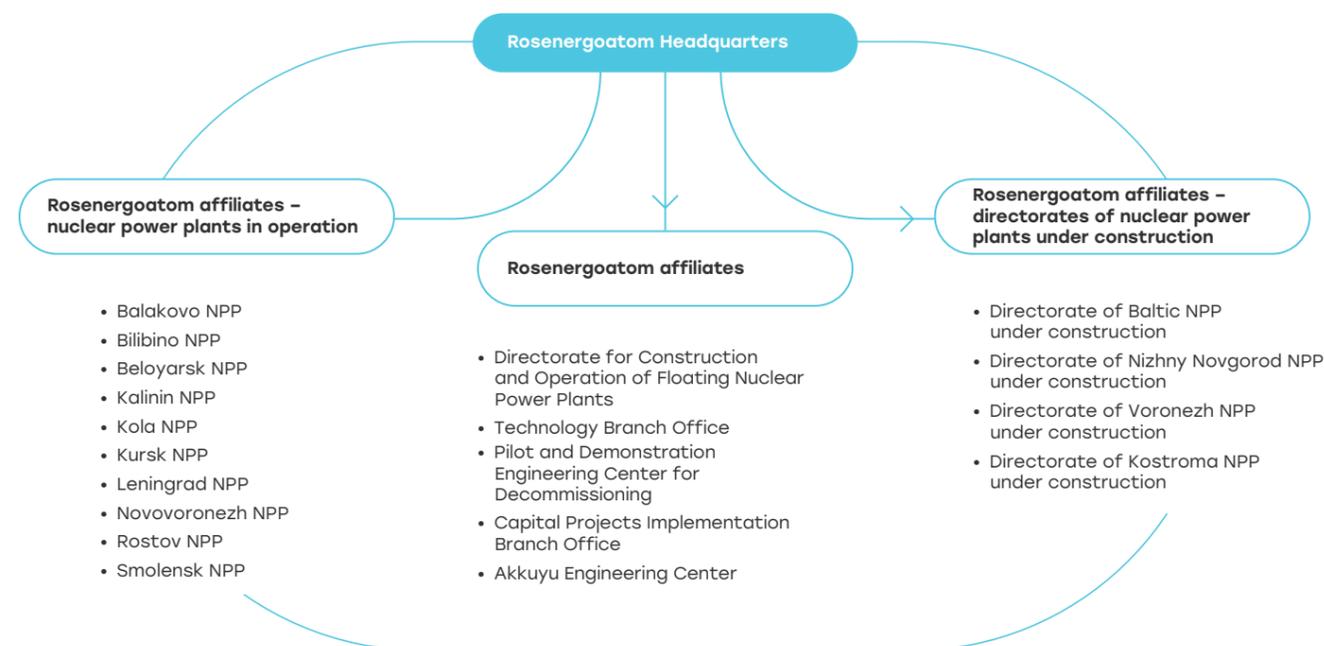
The Company exerts considerable influence on the socioeconomic welfare of the society and environmental protection in the areas of presence (locations of nuclear power plants and regions of business activities), as well as on the global scale.

The Company integrates, as branches: operational nuclear plants, directorates of nuclear plants under construction, Capital Projects Implementation Branch Office, Directorate for Construction and Operation of Floating Nuclear Power Plants, Technology Branch Office, Pilot and Demonstration Engineering Center for Decommissioning, and Akkuyu Engineering Center.

204.3 bln kWh
Power output

30.1 GW
Total installed capacity of NPPs in 2018

Rosenergoatom Corporate Structure as of December 31, 2018



102-10 Stockholders Details¹

Rosenergoatom JSC heads up the Power Engineering Division comprising 35 organizations, 17 of them are Rosenergoatom subsidiaries. Information regarding the Company's subsidiaries is given in Appendix 20.

In 2018, Rosenergoatom was:

- a participant of AtomTeploElectroSet LLC (88.17% stake in the authorized capital) as a result of making a contribution into the authorized capital;
- a stockholder of Atomgarant Non-Governmental Pension Fund Joint-Stock Company (56.3% of the authorized capital) established as a result of Atomgarant NGPF reorganization in the form of conversion into a joint-stock company.

₽ 3,746.862 mln rubles

Dividends from equity holdings in subsidiaries according to the results of 2018 totaled

Stockholders Details¹

Date	Rosatom SC	Atomenergoprom JSC
31/12/2018	13.9204%	86.0796%
31/12/2017	12.4849%	87.5151%
31/12/2016	9.9780%	90.0220%

Revenue and Net Profit of Major Subsidiaries in 2018

Company	Revenue, Mln Rubles	Net profit, Mln Rubles
Atomenergoremont	13,642.51	933.459
Atomtechenergo	8,465.68	1,769.724
VNIIAES	2,104.725	190.0132
AtomEnergoSbyt	58,543.537	- 395.718 ²

Rosenergoatom Joint Stock Company (Rosenergoatom, hereinafter – the Company) is one of the key players in the domestic energy market, it is number one in Russia in terms of the total power output and number two worldwide in terms of NPP installed capacity. In addition, the Company is the only operator of Russian nuclear power plants.

¹ Information regarding the Company's authorized capital and the number of stocks is given in Section 5.1 – Corporate Governance.
² AtomEnergoSbyt losses in 2018 are caused by accrual of provisions for consumer debts.

102-12

Participation in Russian Non-Commercial Organizations¹

102-13

Rosenergoatom is among the founders of Rosatom Technical Academy (autonomous non-profit organization for further vocational education), which is an educational, scientific and methodological center of Rosatom State Corporation in ensuring safe use of nuclear energy and raising the level of the nuclear industry personnel competencies in operational processes. Rosenergoatom is also one of the founding members of the National Nuclear Innovative Consortium (2014).

In 2015, the Company signed the Anti-Corruption Charter of the Russian Business (Russian Union of Industrialists and Entrepreneurs).

Ranking Positions

- **5 Stars rating** (Best Quality Report) following the results of the 15th Annual Reports Contest of RA EXPERT rating agency.
- **3rd prize** in the Energy Companies section of the ranking of social effectiveness of major Russian companies (AK&M Rating Agency).



Winner

SAP Quality Awards 2018 in the CIS – a winner in the Digital Transformation Leadership nomination.



Winner

V.I. Vernadsky National Environmental Award – a winner in the Socio-Ecological Initiatives nomination (for the International Contest of Children's Photos "Hugged by Nature").

Rosenergoatom's Awards in 2018

- V.I. Vernadsky National Environmental Award – a winner in the Socio-Ecological Initiatives nomination (for the International Contest of Children's Photos "Hugged by Nature").
- SAP Quality Awards 2018 in the CIS – a winner in the Digital Transformation Leadership nomination.
- Annual contest of Rosatom State Corporation for the Industry-Level Excellence: Novovoronezh NPP – the 1st prize, Kalinin NPP – the 3rd prize; Smolensk NPP – the winner in the special nomination for the Organization of Environmental Excellence of Rosenergoatom.
- Diploma for Pro-Active Social Policy following the results of the contest held by the Energy Ministry for the best socially-oriented campaign in the energy industry in 2018.
- Eventiada IPRA Golden World Awards for Excellence in Public Relations – first prize in the nomination for the Best Project Meeting International Standards, 2nd prize in the nomination for the Best International Project (jointly with Rosatom State Corporation and Rusatom International Network Private Institution).
- 4th All-Russian Contest MediaTEK 2018 among mass media, press services of the fuel and energy complex, and regional administrations:
 - 3rd prize in the Safe Energy nomination with the Safety First project for the Comprehensive Visual Program of Safety Culture Promulgation in the Nuclear Industry;
 - 3rd prize in in the Social and Ecological Initiative nomination (International Contest of Children's Photos "Hugged by Nature", Russia-Hungary).
 - 3rd prize in the Best Corporate Mass Media nomination (The Energetic People corporate newspaper of Rosenergoatom);
 - 3rd prize in the nomination for the Best Press Service of Regional Company of Fuel and Energy Complex (Novovoronezh NPP).

Rosenergoatom is among the founders of Rosatom Technical Academy (autonomous non-profit organization for further vocational education).

¹ Information about the Company's participation in national and international industry-level associations and other organizations is provided in Appendix 8.

102-16 **1.2. Mission, Vision and Values**



The unified corporate industry-specific values shaped by Rosatom State Corporation are applicable to the entire nuclear power industry of Russia. These values underpin the activities of Rosenergoatom and the companies within its control circuit.

Rosenergoatom is primarily focused on energy safety, protection and safety of people. As an operator company, Rosenergoatom is fully responsible for ensuring nuclear and radiation safety at all stages of the NPPs life cycle, while facing a whole range

Our Mission: Supplying consumers with power and heat produced by the nuclear power plants of Rosenergoatom with guaranteed safety as its top business priority.

Our Vision: A globally diversified power engineering company being one of the global industry leaders and ensuring failsafe and reliable energy supply as well as competitive cost if compared to the power generated by other sources.

102-15	103-2	1.3. Development Strategy
103-1	103-3	

of challenges related to location, design, construction, operation, and decommissioning of NPPs. Important aspects of the Company's activities are socioeconomic development of Russian and environmental protection. Rosenergoatom implements the following principles during performance of its main activity on operation of NPPs:

- ensuring nuclear, radiation, technical, fire and environmental safety, as well as labor protection;
- unconditional compliance with legislation of the Russian Federation, compliance with requirements of federal standards and rules for security, compliance with institutional standards;
- safety culture improvement;
- economic efficiency of power and heat production at NPPs.

The Power Engineering Division of Rosatom State Corporation is headed by Rosenergoatom Joint-Stock Company. The Company's activities are closely related to the business priorities of the State Corporation and based on its three strategic objectives:

- **Increasing the share in international markets;**
- **Reducing prime cost and accelerating processes;**
- **New products for the Russian and international markets.**

In 2018, the Company's Board of Directors resolved to supplement the strategic objectives in order to underpin safety priorities with the following points:

- **Decreasing the probability of accidents affecting the reactor core across the nuclear reactor fleet;**
- **Eliminating fatal occupational injuries at NPPs;**
- **Preventing the accidents leading to personnel exposure to over 50 mSv a year at NPPs;**
- **Avoiding the accidents accompanied by radioactive environmental emissions and effluents exceeding the tolerance limits at NPPs.**

Long-Term Goals and Their Transformation into Mid-Term Goals and Objectives

Strategic Goals

↓ Reducing prime cost and accelerating processes

↑ Increasing the share in international markets

✓ New products for Russian and international markets

Mid-Term Goals

- Increasing return on investments
 - Speeding up construction
 - Cutting down capital expenses per unit
- Ensuring competitive power of key products
 - Reducing costs
 - Boosting output
 - Making use of non-core assets
- Keeping the largest share in the Russian energy balance
- Executing the international contracts within the pre-set parameters
- Increasing the adjusted free cash flow
- NPP servicing abroad throughout the life cycle
- Decommissioning of nuclear and radiation hazard facilities
- Expanding the product range in the Russian Federation:
 - Electricity distribution
 - Isotope products output
 - RAW handling

Prioritized Areas of Safety Assurance Activities*

Strategy Focus on Safety

↓ Decreasing the probability of accidents affecting the reactor core across the nuclear reactor fleet

✗ Eliminating fatal occupational injuries at NPPs

✗ Preventing the accidents leading to personnel exposure to over 50 mSv a year at NPPs

✗ Avoiding the accidents accompanied by radioactive environmental emissions and effluents exceeding the tolerance limits at NPPs

Activities to Achieve the Goals

- Constructing the nuclear power plants in the Russian Federation in accordance with the innovative projects NPP-2006 and VVER-TOI taking into account the approved technologies
- Implementing the programs for life extension, upgrade, failsafe and secure operation of the existing NPP units
- Managing the risks of personnel injury as part of the IMS process for Ensuring Occupational Safety and Health
- Implementing the measuring aimed at prevention of injuries in priorities areas
- Implementing mid-term and long-term Action Plans for optimization of NPP personnel radiation safety
- Implementing the Action Plans aimed at optimization of radiation safety among population in the areas of NPPs

* Prioritized areas of the safety assurance activities pursuing the strategic objectives are approved by the Company's Board of Directors protocol No. 417 dated September 6, 2018.

Contribution to Strategy Implementation in Reporting Period

The power output of nuclear plants in 2018 totaled 204.27 bln kWh (all-time record of the Russian nuclear industry), while the power output in 2017 had reached 202.87 bln kWh, or 0.7% less than the result of 2018.

⚡ 2.94 bln kWh additional output beyond the Russian FAS target

⚡ 18.7% The share of NPPs in domestic electricity production in 2018

Among the major drivers of the nuclear power plants output growth are:

- Commissioning of new capacities;
- Operation of power units with extended service life;
- Measures aimed at increasing the capacity of the existing power units, boosting the equipment efficiency ratio.

The actual power output of NPPs was equal to 101.5% versus the approved target of the Russian FAS balance (201.33 bln kWh).

Among the key factors allowing to exceed the Russian FAS target by 2.94 bln kWh are:

- Optimization of the schedule of pilot commercial operation and low power testing of the Rostov NPP unit No. 4 and the Leningrad NPP-2 unit No. 1 being commissioned;
- Optimization of the duration of scheduled repairs (121 days in total).

The share of NPPs in domestic electricity production totaled 18.7% in 2018.

During 2018, in operation were 37 NPP units with the total installed capacity of 30.11 GW¹.

New NPP units were commissioned in 2018:

- Rostov NPP unit No.4 (VVER-1000);
- Leningrad NPP-2 unit No. 1 (VVER-1200).

In late 2018, the Leningrad NPP unit No. 1 (RBMK-1000) and the Bilibino NPP unit No. 1 (EGP-6) were shut down for decommissioning.

Taking these changes into account, as of January 1, 2019, there were 35 power units at 10 nuclear plants in operation in Russia, including 20 power units with water-cooled pressurized reactors (VVER-440, VVER-1000 and VVER-1200), 13 power units with channel-type reactors (RBMK-1000 and EGP-6) and 2 power units with fast breeder reactors (BN-600 and BN-800).

The total installed capacity of operational NPP units was equal to 29.1GW as of January 1, 2019 (27.89 GW in 2017).

¹ Main indicators of the Russian NPP units operation in 2018 are provided in Appendix 11.

Results of Measures Implementation in 2018

Commissioning of New Capacities

In 2018, among the highlights of Sub-Program 1 – Increasing Power Generation Capacities of Nuclear Power Plants as a part of the Russian Federation Government Program for Nuclear Power Industry Development were:

- Commissioning of the state-of-the-art power unit No. 1 at the Leningrad NPP-2, Generation + with VVER-1200 reactor;
- Commissioning of the Rostov NPP unit No. 4, which completes a series of VVER-1000 power units;
- Start-up of the reactor units No. 1 and No. 2 of the Floating Nuclear Power Plant (FNPP).

Objectives for 2019 and Medium Term

The list of target indicators for the Company in 2019 set by the Strategic Council of Rosatom State Corporation remained unchanged if compared to 2018. The target indicator values are traditionally on the ambitious level achievable through considerable efforts aimed at stepping up the revenues, especially from new products, and cutting down costs. In 2019, pursuant to the objectives set forth in the Russian President decree, ambitious targets were set for all divisions in improving labor productivity, which stimulates enterprises to introduce new products to the market and increase the efficiency of the existing ones.

1.4. Value Creation

The Company creates new value for stakeholders while pursuing the strategy and achieving the strategic objectives owing to transformation of capitals into specific results. The Company's value chain forms part of common industry-level value chains of Rosatom State Corporation organized in accordance with fuel and NPP life cycles.

The characteristic features of capitals and description of value creation processes of the Company are given in 2017 Annual Report.

The Company supplies consumers with the products (primarily electricity, capacity and heat) via sales channels. As a result of its activities, Rosenergoatom offers uninterrupted power supply to end consumers at a competitive price, yields profit to stockholders and ensures asset growth, thus promoting development of the Company and the industry in general.

₽ **9.37 rubles/pers.**
labor efficiency across the Division in 2018

102-9 Rosenergoatom Business Model

Capitals Value Creation

Capitals	Value Creation	
	Strategy	
Finance	<p>Section 2.1</p> <p>Main activities</p> <ul style="list-style-type: none"> Operation of existing NPPs Implementation of new NPP power units construction projects Sales of electricity and heat Servicing of Russian design NPPs abroad 	<p>Section 1.5</p> <p>Consumer relations</p> <ul style="list-style-type: none"> WECM participants AtomEnergoSbyt Regional heat markets Service companies within Power Engineering Division
Human		
Production		
Social and Goodwill	<p>Sections 2.1, 2.3, 2.4, 2.5</p> <p>Development activities</p> <ul style="list-style-type: none"> R&D organization and performance Upgrade of existing NPPs and their service life extension Development of international activity 	<p>Appendix 3</p> <p>Relations with key partners</p> <ul style="list-style-type: none"> Construction, assembly, and repair organizations and enterprises Plants supplying and reprocessing nuclear fuel Suppliers of systems, equipment and materials Engineering and design organizations R&D organizations Research and development centers Service companies
Intellectual		
Natural		

Main Results Shift in Capitals Sustainable Development Goals

Main Results	Shift in Capitals		Sustainable Development Goals				
Mission and values							
<p>EBITDA increased by 1%</p> <table border="1"> <tr><td>2018</td><td>192,897</td></tr> <tr><td>2017</td><td>190,982</td></tr> </table>	2018	192,897	2017	190,982			
2018	192,897						
2017	190,982						
<p>Power output increased by 0.7%</p> <table border="1"> <tr><td>2018</td><td>204.3</td></tr> <tr><td>2017</td><td>202.9</td></tr> </table>	2018	204.3	2017	202.9			
2018	204.3						
2017	202.9						
<p>Labor productivity increased by 8%</p> <table border="1"> <tr><td>2018</td><td>11.5</td></tr> <tr><td>2017</td><td>10.64</td></tr> </table>	2018	11.5	2017	10.64			
2018	11.5						
2017	10.64						
<p>715 mln rubles worth of intangible assets were included into the Company's books</p>							
<p>Growth of number of personnel training hours</p> <table border="1"> <tr><td>2018</td><td>108</td></tr> <tr><td>2017</td><td>92</td></tr> </table>	2018	108	2017	92			
2018	108						
2017	92						
<p>Growth in environmental protection costs</p> <table border="1"> <tr><td>2018</td><td>4,253</td></tr> <tr><td>2017</td><td>3,837</td></tr> </table>	2018	4,253	2017	3,837			
2018	4,253						
2017	3,837						
<p>Growth in funding of regional measures of municipal entities owing to additional tax payments</p> <table border="1"> <tr><td>2018</td><td>2.1</td></tr> <tr><td>2017</td><td>1.97</td></tr> </table>	2018	2.1	2017	1.97			
2018	2.1						
2017	1.97						
	Section 4.2	Section 4.4					
Financial	<p>1,608,189 mln rubles Equity</p> <p>36,437 mln rubles Debt</p>	<p>33,923.5 pers. Average headcount</p> <p>11,5 mln rubles/pers. Labor productivity</p>	<p>1 NO POVERTY</p> <p>2 ZERO HUNGER</p> <p>3 GOOD HEALTH AND WELLBEING</p> <p>4 QUALITY EDUCATION</p> <p>5 GENDER EQUALITY</p> <p>6 CLEAN WATER AND SANITATION</p>				
<p>1,609,244 mln rubles Net assets</p> <p>829,447 mln rubles Authorized capital</p>	<p>3,497,348 Total number of NPP personnel training hours</p> <p>83% Satisfaction level</p>	<p>7 AFFORDABLE AND CLEAN ENERGY</p> <p>8 DECENT WORK AND ECONOMIC GROWTH</p> <p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p> <p>10 REDUCED INEQUALITIES</p> <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>					
Production	<p>37 power units in operation in 2018</p> <p>Partners: construction, assembly and repair enterprises; nuclear fuel suppliers; suppliers of systems and equipment</p>	<p>74.5% Support for the nuclear power industry in the Russian Federation</p> <p>Attitude of stakeholders to the Company and its activities, including trust and readiness to cooperate</p>	<p>13 CLIMATE ACTION</p> <p>14 LIFE BELOW WATER</p> <p>15 LIFE ON LAND</p> <p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p>				
Intellectual	<p>2,555.7 mln rubles Intangible assets value</p>	<p>Section 3.2</p> <p>Natural</p> <p>6,612.5 mln m³ Volume of water withdrawn from sources</p> <p>6,178.5 mln m³ water were removed</p> <p>0,03% the share of contaminated waste water</p> <p>35,077 t of waste generated (-35 t as compared with 2017)</p>	<p>17 PARTNERSHIPS FOR THE GOALS</p> <p>SUSTAINABLE DEVELOPMENT GOALS</p>				

1.5. Situation in Electric Power Industry

Macroeconomics



"Power industry development is a key to success in other economic sectors."

Alexander Novak,
Minister of Energy of the
Russian Federation

The global economy grew by 3.7% in 2018¹. Global economic slowdown risks are predominant. The global economy growth is forecast to reach 3.5% in 2019 and 3.6% in 2020. One of the major sources of risk for the economic prospects is growing tension in trade on all levels. Financial conditions are becoming more stringent. The global GDP growth rate is forecast to decrease to 3.2% by 2024.

In accordance with the estimates of the Russian Economic Development Ministry, the domestic GDP will grow 2.0% in 2018 after the growth of 1.6% in 2017². Industrial production growth in 2018 accelerated to 2.9% (from 2.1% in 2017). All major industries featured positive changes. Growth in the mineral resources extraction and processing industries continued, the power industry and water supply growth rates came back to positive after a decrease in 2017.

Electricity and Capacity Market. Nuclear Generation Role

By the end of 2018, there were 450 nuclear power reactors in operation in the world, including 9 newly connected to grid. Construction of 5 reactors began, and the total number of reactors under construction totaled 55 globally, while 7 reactors were finally shut down. By the end of 2018, the NPP generating capacities totaled 400,3 GW worldwide.

The IAEA forecasts a high growth of the installed capacity in the global nuclear industry by 2030 versus the level of 2016 – by 42%, by 83% in 2040, and by 123% in 2050³. In the pessimistic scenario, it will drop by 12% in 2030 and 15% in 2040, reaching again the present level by 2050.

In terms of the number of reactors in operation, Russia takes the 5th place after the USA, France, China and Japan (as of December 31, 2018). In terms of installed capacity of NPPs and the amount of operating power



30.1 GW

total installed capacity of Rosenergoatom NPPs by the end of 2018⁷.

units Rosenergoatom holds the 2nd place in the world among leading global companies operating NPPs (1st place – EDF, France).

The Russian UES power complex embraces 805 power stations with the capacity exceeding 5 MW. As of January 1, 2019, the total installed capacity of the Russian UES power plants totaled 243,243.2 MW.

The installed capacity of the Russian UES power plants increased by 5,086.9 MW owing to commissioning of the new and upgrading of the operational generating equipment at power

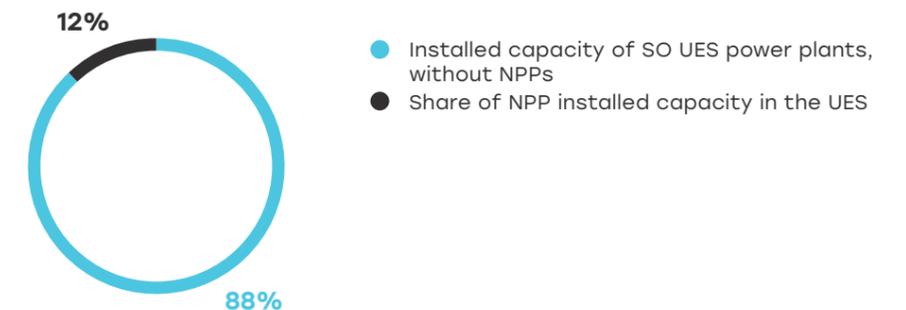
plants. New capacity introduced in 2018 at electric power plants of the UES of Russia, taking into account electric power plants of industrial facilities, totaled 4,792.1 MW. Decommissioned was 1,950.4 MW of inefficient and obsolete generating equipment.

In 2018, Russia put 4.7 GW of new capacities into operation, including 2.2 GW of nuclear capacities. All plants generate some 1 trillion kWh of power a year. In 2018, Russian UES power plants generated 1,070.9 bln kWh, or 1.6% more than in 2017⁸. Power consumption in 2018 totaled 1,055.6 bln kWh, which is above the actual level of 2017 by 15,679.1 mln kWh (1.51% growth).

World's Top 6 Companies (As of the End of 2018)

№	Operator Company	International Abbreviation	Country	Number of Units	Number of Sites	Installed Capacity, Net MW (Power)	Installed Capacity, Gross MW (Power)	Generation in 2017 GWh (Supply)	Generation in 2016 GWh (Supply)	Generation in 2015 GWh (Supply)
1	Électricité de France	EDF	France	58	19	63,130	65,880	381,846.02	386,452.88	419,022.15
2	Rosenergoatom	REA	Russia	37 ⁴	10	27,339	29,096	190,115.15 (supply) 202,868 (generation)	183,180.81 (supply) 196,366 (generation)	182,807.13 (supply) 195,214 (generation)
3	Korea Hydro and Nuclear Power	KHNP	South Korea	24 ⁵	6	22,494	23,519	141,278.32	151,455.4	157,198.94
4	Exelon Corporation	Exelon	USA	22 ⁶	13	22,310	23,569	191,876.23	186,875.71	182,810.48
5	NNEGC Energoatom	NNEGC	Ukraine	15	4	13,107	13,835	80,405.85	76,077.79	82,405.17
6	EDF-Energy	EDF UK	Great Britain	15	7	8,918	10,362	63,886.83	65,148.98	63,894.54

Installed Capacity Structure in the UES



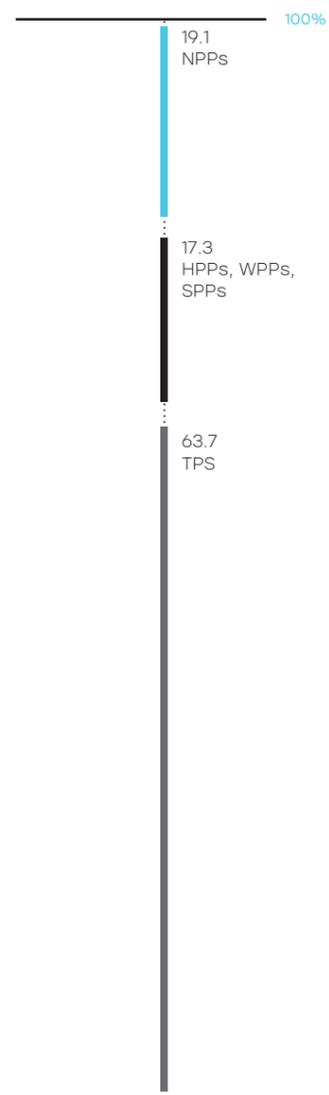
1 imf.org/ru/Publications/WEO/Issues/2019/01/11/weo-update-january-2019
2 economy.gov.ru/wps/wcm/connect/999d32ab-2c3c-4ec0-b529-320ef0f98d2c/190125_5.pdf?MOD=AJPERES&CACHEID=999d32ab-2c3c-4ec0-b529-320ef0f98d2c3
3 IAEA 2017 Annual Report.
4 The data is given as of 2018. As of January 1, 2019 – 35 power units. Commissioned units: were the Rostov NPP unit No. 4 – on February 2, 2018, the Leningrad NPP-2 unit No. 1 – on March 9, 2018, finally shut down: were the Novovoronezh NPP unit No. 3 – on December 25, 2016, the Leningrad NPP unit No. 1 – on December 22, 2018. Power generation data of 2015 pertain to 35 units, 2016 – 36 units, 2017 – 35 units.

5 The Shin-Wolsong NPP power unit No. 2 was commissioned in February 2015, the Shin-Kori NPP unit No. 3 – in January 2016. The Kori NPP unit No. 1 was finally shut down in June 2017. Power generation data of 2015 pertain to 24 units, 2016 – 25 units, 2017 – 25 units.
6 The Oyster Creek NPP unit was finally shut down in 2018. Power generation data of 2015-2017 pertain to 23 units.
7 Detailed information is provided in Section 2.1 – Generating Capacities.
8 so-ups.ru/index.php?id=ees

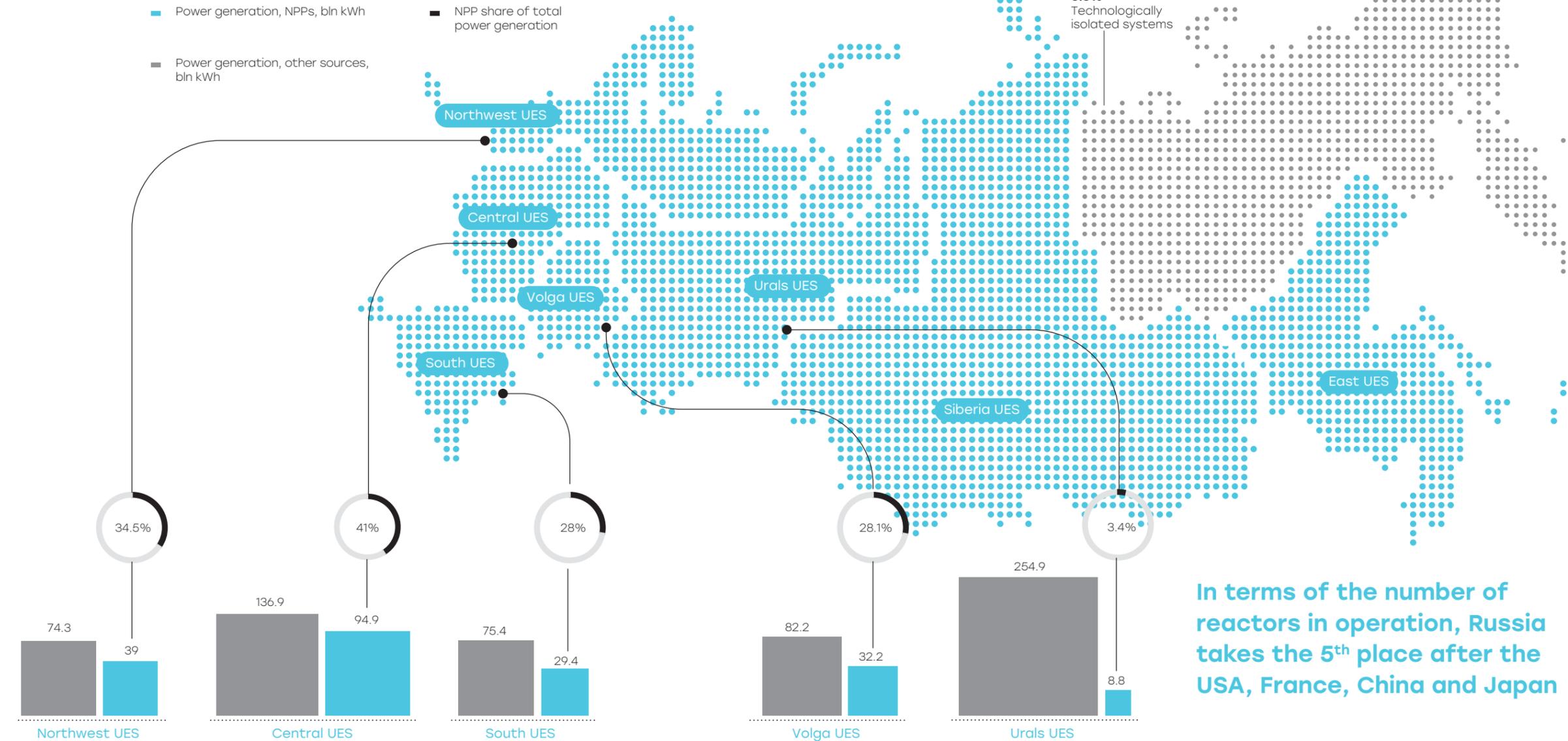
10,070.9 bln kWh
the nuclear plants of the Russian UES produced in 2018

1,055.6 bln kWh
Power consumption in 2018

Structure of Electricity Generation in the UES of Russia by Type of Power Plants, %



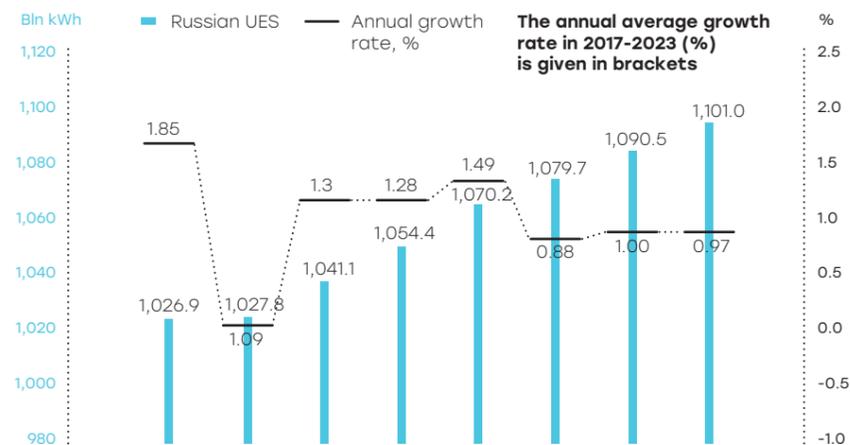
Share of NPPs in Electricity Generation by Regions in 2018



In terms of the number of reactors in operation, Russia takes the 5th place after the USA, France, China and Japan

Rosenergoatom is the leader of Russian generating companies in terms of power output.

Forecast Demand for Power in Russian UES between 2017 and 2023¹



Power Output and Installed Capacity of Rosenergoatom Compared to Largest Generating Companies of Russia, 2016-2018

Company	Power Output, Bln kWh			Installed Capacity, GW		
	2016	2017	2018	2016	2017	2018
Rosenergoatom ²	196.4	202.9	204.3	27.1	27.9	30.1
Gazprom Energoholding ²	153.8	150.8	149.2	38.0	38.8	38.8
RusHydro	138.8	140.3	144.2	38.9	39.0	39.4
INTER RAO – Electric Power Plants	91.8	95.0	94.6	22.1	22.4	22.9
T Plus Group	53.9	53.6	55.1	15.3	15.7	15.5
Irkutskenergo	48.1	46.6	n/a	13.0	13.0	13.0

Sources: www.gazenergo.com.ru, www.rushydro.ru, irao-generation.ru, www.tplusgroup.ru, www.irkutskenergo.ru

¹ The Russian Energy Ministry Order No. 143 dated March 1, 2017 on Approval of the Development Pattern and Program for Unified Energy System of Russia in 2017-2023.
² The share of power generation by Russian nuclear plants totals some 18.9%.

102-6 Distribution Results

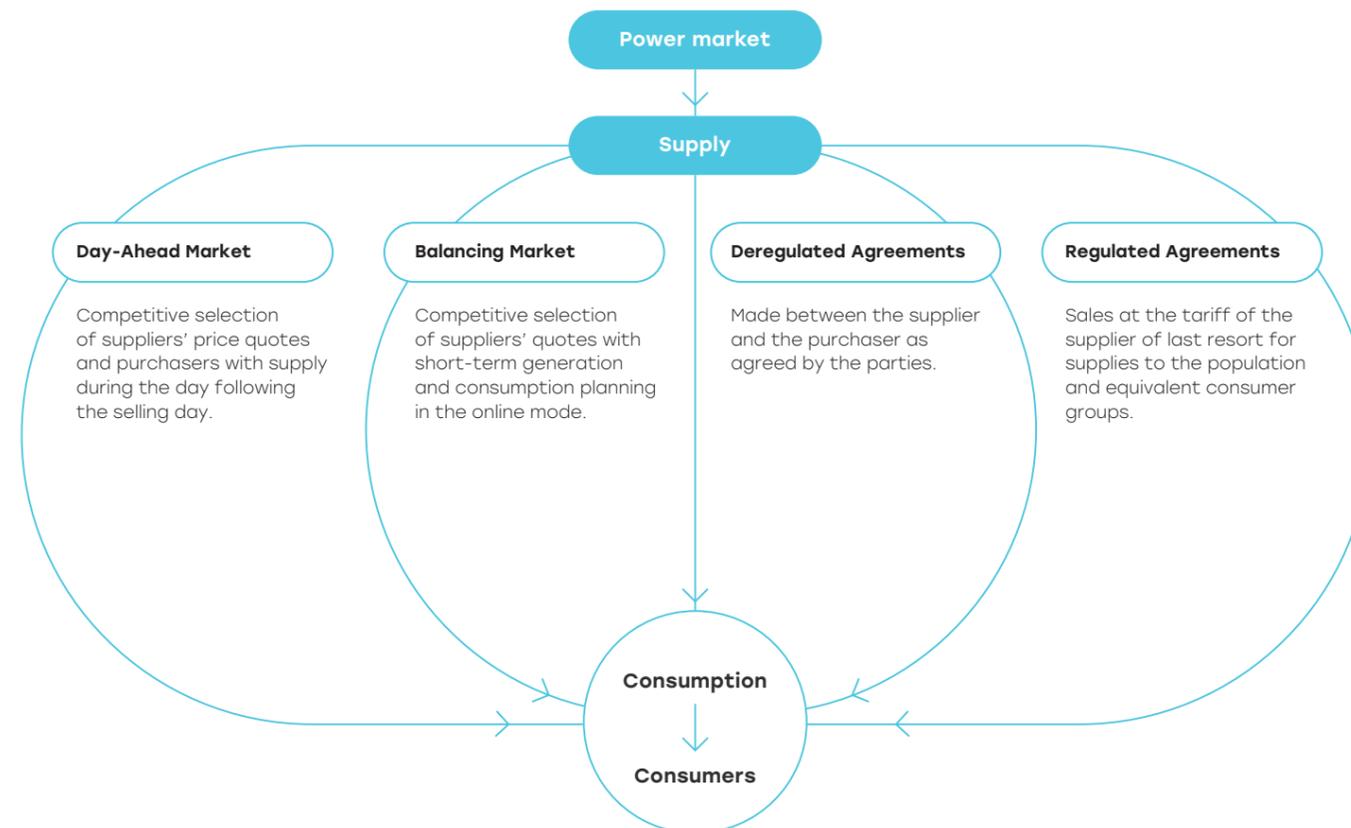
Rosenergoatom – WECM Supplier³

The WECM received 204.06 bln kWh (or 99.9%) in 2018, while the retail market – 0.22 bln kWh, or 0.1% (Bilibino NPP output).

The planned NPP power output specified in the Russian FAS balance target is 201.33 bln kWh. The additional NPP power output totaled 2.94 bln kWh, or 1.5%.

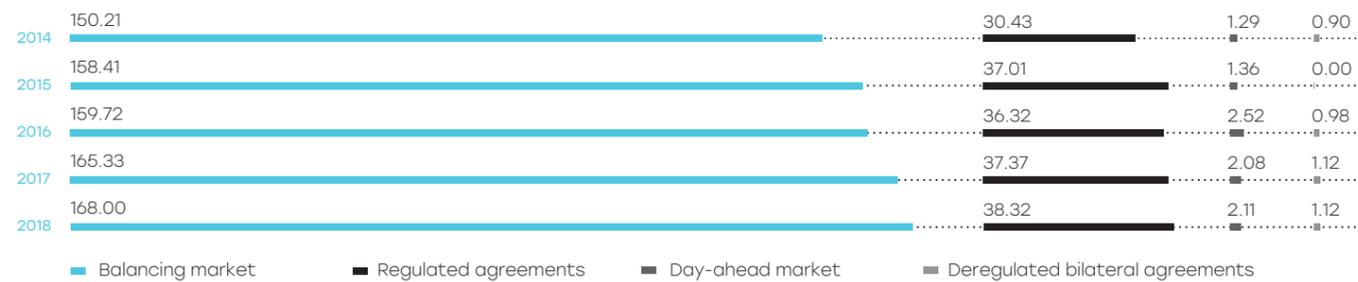
In 2018, the Company supplied electricity in the WECM under regulated contracts, on the day-ahead basis, in the balancing market, and under free contracts. Capacity was supplied under regulated contracts, capacity sale contracts executed following competitive

selection of price quotes for capacity sale, and capacity sale contracts of new NPP facilities. Meanwhile, payments for electricity and capacity supplied under regulated contracts, and payment for capacity under capacity purchase and sale contracts with new nuclear power plant facilities were made at the tariffs (prices) set for the Company by the Russian FAS for 2018.



³ Additional information may be found in the Company's 2016 Annual Report, the Sales Market and Product Consumers section, Page 39.

Rosenergoatom Power Supply Structure in WECM in 2014-2018, Bln KWh



15.9 bln kWh
Net power supply in 2018

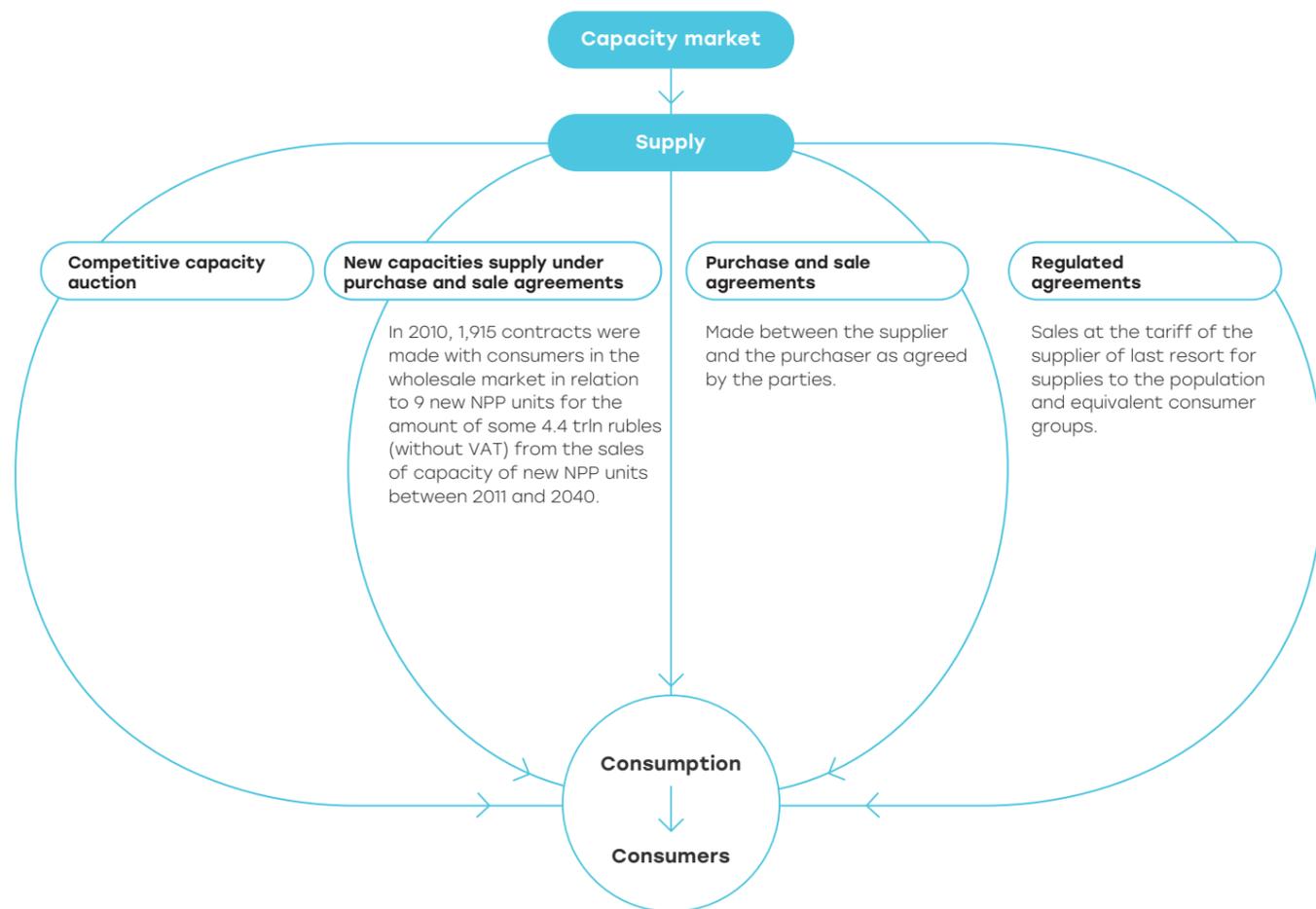
Retail Distribution

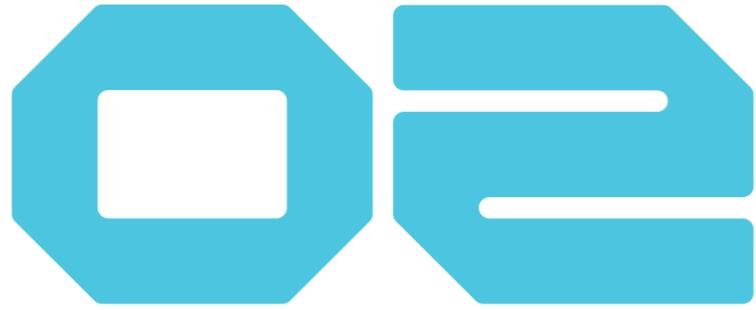
In 2018, AtomEnergoSbyt, a subsidiary of the Company, maintained the status of the 'last resort supplier' of power in the Kursk, Tver, Smolensk and Murmansk Oblasts through established branches and standalone structural units.

All branches of AtomEnergoSbyt implemented a project for development of additional products (B2b and B2C). The project revenues totaled 123.32 mln rubles without VAT in 2018 (3 mln rubles (2.8%) more than the target value).

Net power supply totaled 15.9 bln kWh in 2018, which is 1.7% lower than in 2017 (16.1 bln kWh). The volumes decreased due to a general drop in consumption by major enterprises (introduction of power saving programs), and due to the exit of some consumers from the WECM. Net supply to the population (including equal-status categories) in 2018 remained at the level of 2017 – 4.1 bln kWh.

Net power supply totaled 15.9 bln kWh in 2018, which is 1.7% lower than in 2017 (16.1 bln kWh).





Technological Leadership and Innovations

2.1. Generating Capacities. Developing Generating Potential	38
2.2. Sci-Tech Policy. Innovations	63
2.3. Digitalization Program	71
2.4. International Sci-Tech Cooperation	79
2.5. International Business and New Products	82

A strategic goal of Rosenergoatom is to provide for an increase in the share of nuclear power in the national energy balance while ensuring the necessary safety level, by means of building new power units of NPPs, inter alia.

EU1 | EU2

2.1. Generating Capacities. Developing Generating Potential

204.27

bln kWh
produced by Russian nuclear plants in 2018 is a new record. The record of 2017 was 202.87 bln kWh

101.5

%
The FAS balance target for 2018 is 101.5% achieved. The target level for 2018 is 201.33 bln kWh

35.19

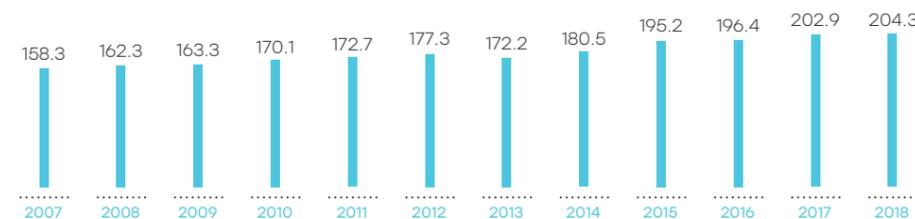
bln kWh
were produced in 2018 by the Kalinin NPP. This is a record high amount of electricity throughout the history of Russian nuclear plants operation. The plant fulfilled the Russian FAS target by 103.86%

Meanwhile, the capacity factor (CF) of 100.42% was achieved, which exceeds the CF of Rosenergoatom nuclear plants. This parameter characterizes the efficiency of NPPs, including technology, work organization, personnel qualification and many other factors. A share of the electricity produced by the Kalinin NPP in the energy balance of the Tver Oblast exceeds 83%.

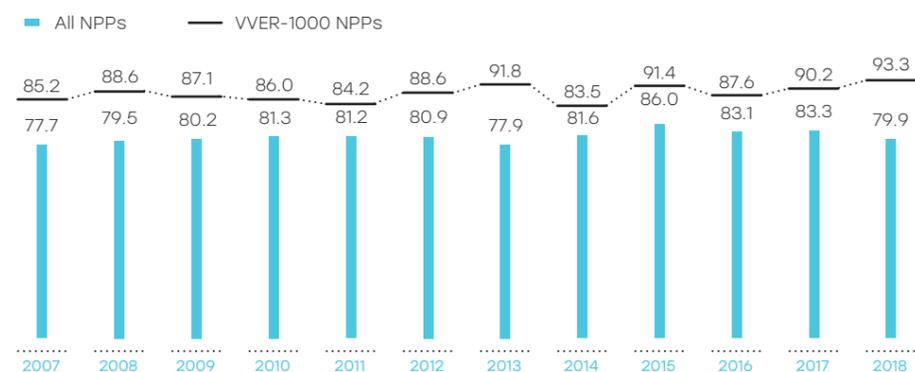
31.9 bln kWh
were produced by the Balakovo NPP in 2018

29.4 bln kWh
were produced by the Rostov NPP in 2018

Power Generation (bln kWh)



Capacity Factor, %



Among the major drivers of the power output growth are:

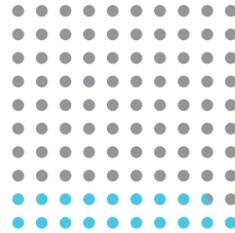
- Optimized schedule of pilot commercial operation of newly commissioned power units;
- Capacity supply by the Rostov NPP unit No. 4 began two months ahead of schedule;
- In 2018, two new NPP units passed the reactor power start-up – the Leningrad NPP-2 unit No. 1 with an innovative VVER-1200 reactor, and the Rostov NPP unit No. 4.
- Reduced duration of scheduled repairs of NPP units.

A lower capacity factor was achieved due to longer scheduled repairs of power units:

- Beloyarsk NPP unit No. 4: additional operations required for BN-800 core refueling;
- Kursk NPP units No. 1, 2 and 3: increased scope of resource characteristics recovery operations at the power units No. 1 and 2; required replacement of emergency cooling devices for process tubes of the power unit No. 3;
- Novovoronezh NPP unit No. 4: untimely supply of cable products and their late certification for the power unit service life extension operations.

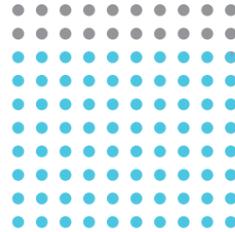
18.7

%
of the total amount of power generated
in the Russian Federation is attributable
to the Company's NPPs (18.9% in 2017).
Each fifth light bulb in the Russian
generation uses the energy produced by
a nuclear power plant



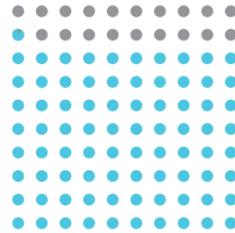
79.9

%
is the capacity factor of 2018
(83.29% in 2017)

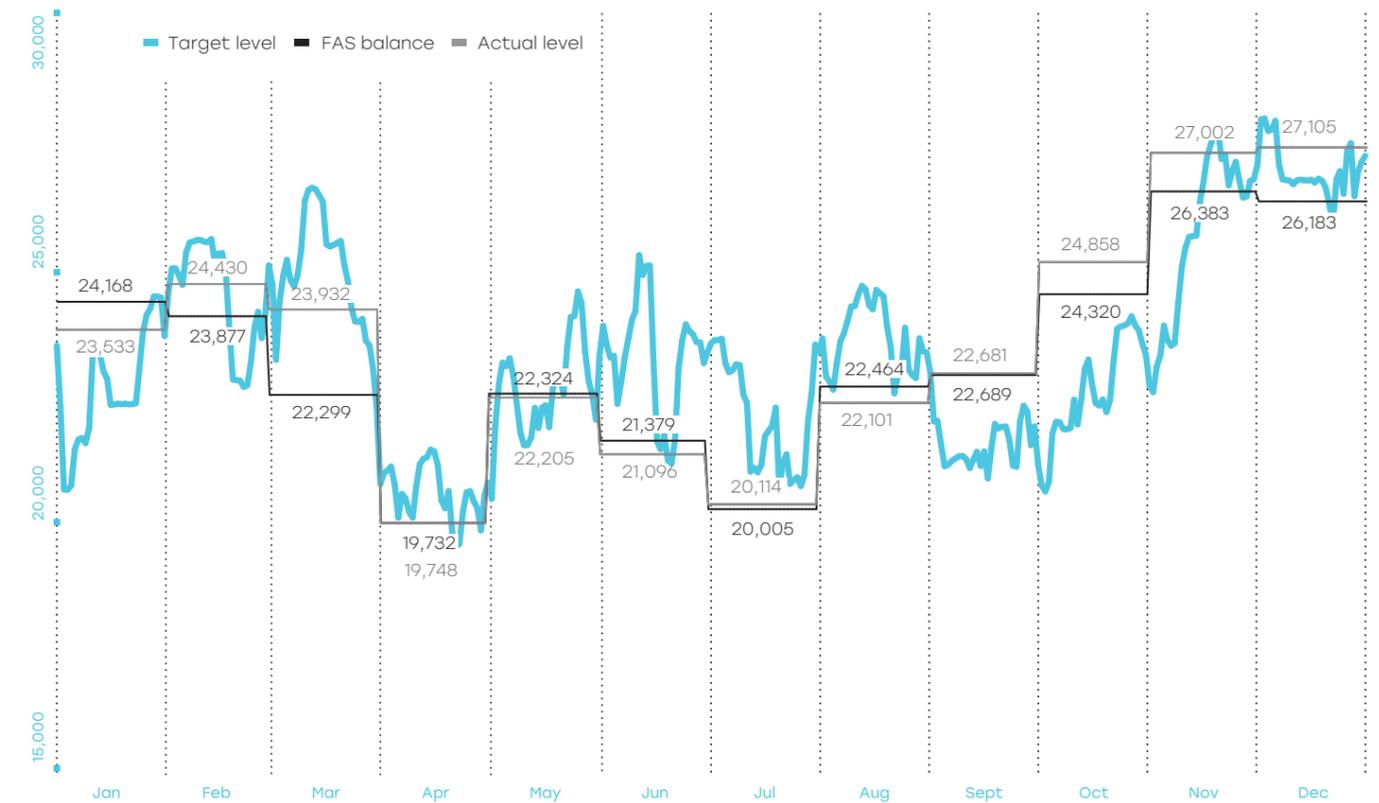


80.97

%
is the availability factor of 2018
(85.36% in 2017)



Load Distribution Chart of Russian NPPs in 2018
(as of January 1, 2019)



31,861.4 mln kWh
Power generation in 2018



Balakovo NPP



Saratov Oblast

12,5 km
away from the satellite town of Balakovo

145 km
away from the regional center (Saratov)

Power Unit	№1	№2	№3	№4
Reactor Type	VVER-1000	VVER-1000	VVER-1000	VVER-1000
Installed Capacity	1,000 MW	1,000 MW	1,000 MW	1,000 MW
Start-Up Date	1985	1987	1988	1993

Aggregate installed capacity 4,000 MW

Operating Performance

790.7 bln kWh
the Balakovo NPP generated from the power unit No. start-up date

15.6%
of Rosenergoatom's total power output in 2018 produced by the Balakovo NPP



Generation vs 2017



Russian FAS balance target achievement

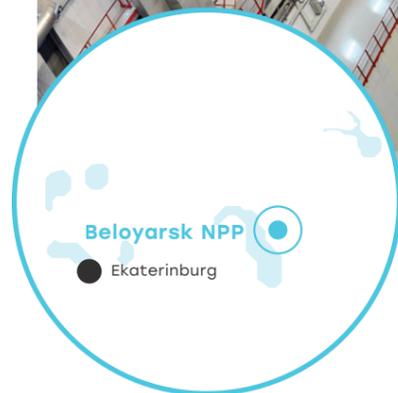


Capacity factor

8,838.4 mln kWh
Power generation in 2018



Beloyarsk NPP



Sverdlovsk Oblast

3,5 km
away from the satellite town of Zarechny

45 km
away from the regional center (Ekaterinburg)

Power Unit	№3	№4
Reactor Type	BN-600	BN-800
Installed Capacity	600 MW	885 MW
Start-Up Date	1980	2015

Aggregate installed capacity 1,485 MW

Operating Performance

196.5 bln kWh
the Beloyarsk NPP generated from the power unit №1 start-up date

4.3%
of Rosenergoatom's total power output in 2018 produced by the Beloyarsk NPP



Generation vs 2017



Russian FAS balance target achievement



Capacity factor

The Beloyarsk NPP named after I.V. Kurchatov is the eldest nuclear plant in the USSR. The Beloyarsk NPP is Russia's only power plant with power units of various types.

212.3 mln kWh
Power generation in 2018



Bilibino NPP



Chukotka Autonomous Okrug

4,5 km
away from the satellite town of Bilibino

610 km
away from the regional center (Anadyr)

Power Unit	№1*	№2	№3	№4
Reactor Type	EGP-6	EGP-6	EGP-6	EGP-6
Installed Capacity	12 MW	12 MW	12 MW	12 MW
Start-Up Date	1974	1974	1975	1976

Aggregate installed capacity **48 MW**

* On December 31, 2018 Rosenergoatom has been granted a license to operate the power block №1 of the Bilibino NPP, which has now been stopped for decommissioning, in a no-generation mode.

Operating Performance

10.31 bln kWh
the Bilibino NPP generated from the power unit No. start-up date

0.1%
of Rosenergoatom's total power output in 2018 produced by the Bilibino NPP

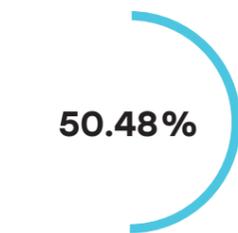
66.65%
Availability ratio



Generation vs 2017



Russian FAS balance target achievement



Capacity factor

35,187.8 mln kWh
Power generation in 2018



Kalinin NPP



Tver Oblast

4 km
away from the satellite town of Udomlya

125 km
away from the regional center (Tver)

Power Unit	№1	№2	№3	№4
Reactor Type	VVER-1000	VVER-1000	VVER-1000	VVER-1000
Installed Capacity	1,000 MW	1,000 MW	1,000 MW	1,000 MW
Start-Up Date	1984	1986	2004	2011

Aggregate installed capacity **4,000 MW**

Operating Performance

604.13 bln kWh
the Kalinin NPP generated from the power unit No. start-up date

17.2%
of Rosenergoatom's total power output in 2018 produced by the Kalinin NPP



Generation vs 2017



Russian FAS balance target achievement



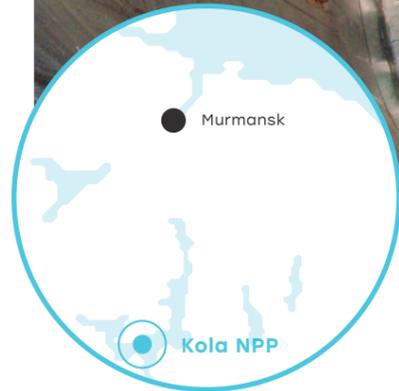
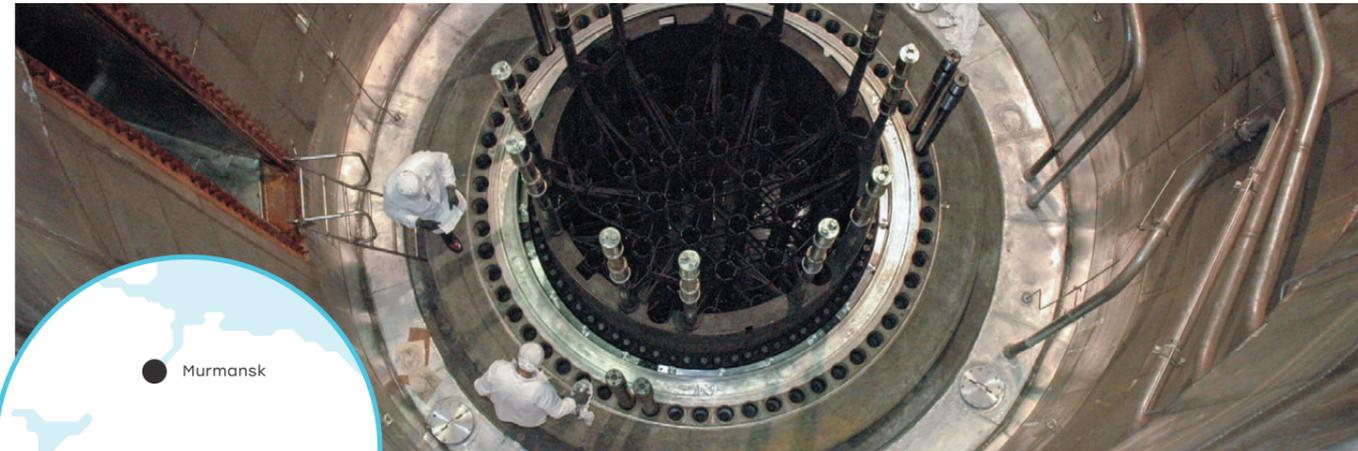
Capacity factor

10,234.2 mln kWh
Power generation in 2018

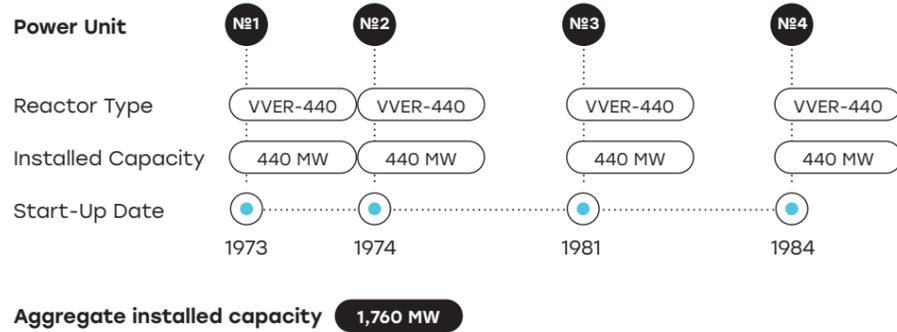


Kola NPP

The Kola NPP is the first nuclear power plant of Russia built beyond the Arctic circle.



In 2018, the Kola NPP obtained the license from Rostekhnadzor for the power unit №1 operation during an additional 15-year period (up to 60 years).



Kola Peninsula

11 km
away from the satellite town of Polyarnye Zori

170 km
away from the regional center (Murmansk)

Operating Performance

419.54 bln kWh
the Kola NPP generated from the power unit No. start-up date

5.0%
of Rosenergoatom's total power output in 2018 produced by the Kola NPP

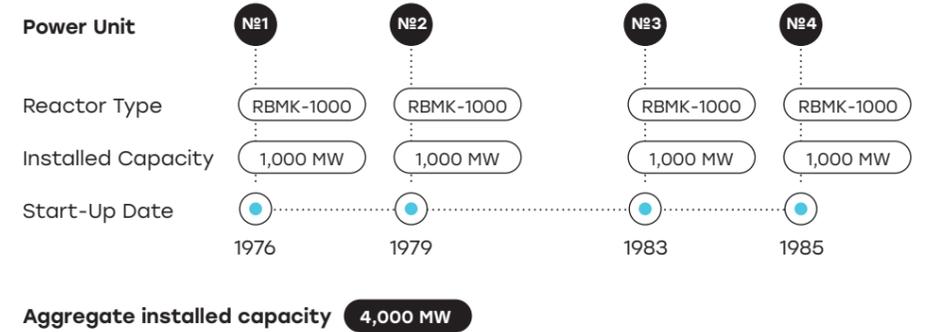
73.03%
Availability ratio



24,773.3 mln kWh
Power generation in 2018



Kursk NPP



Kursk Oblast

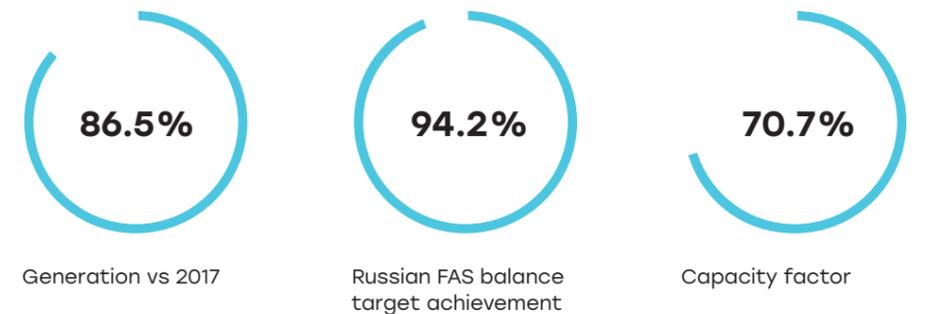
4 km
away from the satellite town of Kurchatov

40 km
away from the regional center (Kursk)

Operating Performance

912.46 bln kWh
the Kursk NPP generated from the power unit №1 start-up date

12.1%
of Rosenergoatom's total power output in 2018 produced by the Kursk NPP



28,815.4 mln kWh
Power generation in 2018
including power unit No. Leningrad
NPP – **2,719.3 mln kWh**



Leningrad NPP

The Leningrad NPP is the first plant in Russia with reactors of RBMK-1000 type.



On October 2018, the Leningrad NPP-2 commissioned a new power unit №1 with VVER-1200 reactor (NPP-2006 series). According to the qualification review results, the installed capacity totaled 1,187.6 MW.

Power Unit	№1*	№2	№3	№4	№1 NPP-2
Reactor Type	RBMK-1000	RBMK-1000	RBMK-1000	RBMK-1000	VVER-1200
Installed Capacity	1,000 MW	1,000 MW	1,000 MW	1,000 MW	1,187.6 MW
Start-Up Date	1973	1975	1979	1981	2018

Aggregate installed capacity 4,187.6 MW

* On December 22, 2018 Rosenergoatom has been granted a license to operate the power block №1 of the Leningrad NPP, which has now been stopped for decommissioning, in a no-generation mode.

Leningrad Oblast

5 km
away from the satellite town of Sosnovy Bor

70 km
away from the regional center (Saint Petersburg)

Operating Performance

1,027.15 bln kWh
the Leningrad NPP generated from the power unit №1 start-up date (including power unit №1 Leningrad NPP-2)

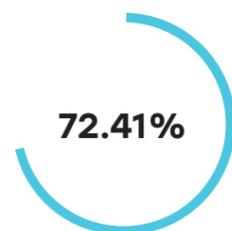
14.1%
of Rosenergoatom's total power output in 2018 produced by the Leningrad NPP



Generation vs 2017



Russian FAS balance target achievement



Capacity factor (excluding power unit No. Leningrad NPP-2)

15,971.4 mln kWh
Power generation in 2018



Novovoronezh NPP

The Novovoronezh NPP is one of the oldest enterprises in the Russian Federation nuclear power industry.



Follow-up life extension work was underway in 2018 in order to extend the life of the Novovoronezh NPP power unit No. 4 for another 15 years. The power unit was hooked up to the grid on December 29, 2018.

Power Unit	№4	№5	№1 NVNPP II
Reactor Type	VVER-440	VVER-1000	VVER-1200
Installed Capacity	417 MW	1,000 MW	1,180.3 MW
Start-Up Date	1972	1980	2016

Aggregate installed capacity 2,597.3 MW

Voronezh Oblast

3.5 km
away from the satellite town of Novovoronezh

45 km
away from the regional center (Voronezh)

Operating Performance

560.12 bln kWh
the Novovoronezh NPP generated from the power unit №1 start-up date

7.8%
of Rosenergoatom's total power output in 2018 produced by the Novovoronezh NPP



Generation vs 2017



Russian FAS balance target achievement



Capacity factor

29,369.6 mln kWh
Power generation in 2018
including power unit №4 –
6,135.0 mln kWh



Rostov NPP

The Rostov NPP is the first plant in Russia
with reactors of RBMK-1000 type.



The Rostov NPP is one of a series of unified NPP projects with VVER-1000 reactors meeting the requirements for flow-line construction. On September 28, 2018, the Rostov NPP power unit № 4 was put into operation. The power unit annual output exceeded 6 bln kWh.

Power Unit	№1	№2	№3	№4
Reactor Type	VVER-1000	VVER-1000	VVER-1000	VVER-1000
Installed Capacity	1,000 MW	1,000 MW	1,000 MW	1,030.3
Start-Up Date	2001	2010	2014	2018

Aggregate installed capacity **4,030.3 MW**

Rostov Oblast

16 km
away from the satellite
town of Volgodonsk

250 km
away from the regional
center (Rostov-on-Don)

Operating Performance

239.96 bln kWh
the Rostov NPP generated
from the power unit
№1 start-up date

14.4%
of Rosenergoatom's total
power output in 2018 produced
by the Rostov NPP



Generation vs 2017



Russian FAS balance
target achievement



Capacity factor
(excluding power
unit No. 4)

19,011.9 mln kWh
Power generation in 2018



Smolensk NPP



Smolensk Oblast

4.5 km
away from the satellite
town of Desnogorsk

105 km
away from the regional
center (Smolensk)

Power Unit	№1	№2	№3
Reactor Type	RBMK-1000	RBMK-1000	RBMK-1000
Installed Capacity	1,000 MW	1,000 MW	1,000 MW
Start-Up Date	1982	1985	1990

Aggregate installed capacity **3,000 MW**

Operating Performance

658.26 bln kWh
the Smolensk NPP generated
from the power unit
No.1 start-up date

9.3%
of Rosenergoatom's total
power output in 2018 produced
by the Smolensk NPP



Generation vs 2017



Russian FAS balance
target achievement



Capacity factor

Expansion of Power Production Capabilities at Operating NPPs

New power units commissioning

8.9 bln kWh

(Rostov NPP power unit No.4, Leningrad NPP-2 power unit No.1 put into commercial operation)

Modernization and service life extension of power units

121.5 bln kWh

26 power units of Russian NPPs are operating with extended service life and aggregate installed capacity of 18,825 MW

VVER power units capacity increase

3.6 bln kWh

11 VVER-1000 power units are operating with $N_{\text{heat}} = 104\%$

Repair campaigns optimization

2 bln kWh

is the additional power output achieved through optimization of repair campaigns

New Power Units Construction

Pursuant to the Russian Energy Strategy until 2030, and the General Allocation Pattern for Russian Energy Facilities until 2035, a strategic goal of Rosenergoatom is to provide for an increase in the share of nuclear power in the national energy balance while ensuring the necessary safety level, by means of building new power units of NPPs, inter alia.

Six NPP units¹ and a FNPP were under construction in 2018.

In the reporting year, the Rostov NPP unit No. 4 completing a series of VVER-1000 reactors, and the Leningrad NPP-2 unit No. 1 of Generation 3+ with VVER-1200 reactor were put into operation.

New NPP Units in 2018



Rostov NPP unit No. 4

September 28, 2018
commissioning

6,136 mln kWh
Power output



Leningrad NPP No. 5

October 24, 2018
commissioning

2,719 mln kWh
Power output



Floating Nuclear Power Plant

November 10, 2018
start of comprehensive testing of the FPU reactor system

Reactor facility 1, 2
low power testing

¹ Without the Baltic NPP units No. 1 and 2, which were undergoing scheduled operations in 2018 for maintenance of the construction site in proper condition until the decision is made regarding the project configuration change and for preservation of structures.

Building New NPP Units in 2018

In 2018, taking into account the NPP units commissioned, the number of construction and assembly personnel decreased considerably versus 2017. At the same time, participation of construction and assembly personnel in construction of facilities abroad.

Building New NPP Units in 2018

Power Unit	Reactor Type	Work Performed
Rostov NPP unit No. 4	VVER-1000	Commissioned
Leningrad NPP-2 unit No. 1	VVER-1200	Commissioned
Novovoronezh NPP-2 unit No. 2	VVER-1200	Main Equipment Revision sub-stage completed after hot functional testing of the reactor system
Leningrad NPP unit No. 2	VVER-1200	Welding and heat treatment of the main cooling pipeline units of the reactor system
Kursk NPP unit No. 1	VVER-TOI	Concreting of the reactor building underframe completed and construction of the reactor building outer walls started. Concreting of the turbine building underframe started
Kursk NPP unit No. 2	VVER-TOI	Reinforcing of the reactor building underframe started

Personnel of NPP Units under Construction

Number of Main Organizations Involved	Total Employees Involved	Including:	
		Engineers and Technical Employees	Blue collar workers
116	8,572	805	7,767
Including those directly involved in NPPs construction			
Novovoronezh NPP-2 (48)	2,711	208	2,503
Rostov NPP (23)	846	138	708
Kursk NPP-2 (19)	2,320	191	2,129
Leningrad NPP-2 (26)	2,695	268	2,427

10-10.5K persons
The maximum demand for construction and assembly professionals in 2019

Supplied Equipment Quality Management¹

In 2018, due to the issuance of the Assessment Rules for Goods Subject to Safety Assurance Requirements in Nuclear Power Sector, and Processes of their Design Development (Including Engineering), Production, Construction, Assembly, Start-Up, Operation, Storage, Transportation, Sales, Disposal and Burial (NP-071-18, hereinafter – the Rules), an action plan containing the following organizational and technical measures was developed and approved

in order for the Rules to be applied in the Company:

- The Rules were clarified for the NPP branches, general contractors, manufacturing plants and authorized organizations;
- The Company's regulatory documents were updated;
- Introduction of changes in typical supply agreements was initiated.

¹ For detailed information on the supplied equipment quality management, please refer to 2017 Annual Report.

Modernization and Service Life Extension of Power Units

Areas of the existing NPP power units upgrade:

- **current upgrade** performed annually at each NPP unit, irrespective of the service life, in order to maintain the design characteristics, the required level of safety and reliability, and the NPP equipment life management.
- **comprehensive target-oriented modernization** held with a view to prepare the NPP units approaching the end of their service life for life extension over an additional period (15-30 years).

The unified NPP upgrade policy stipulates:

- Planning – shaping and implementation of long-term upgrade plans correlated with the NPP safety assessment and operation licensing;
- Optimization – NPPs upgrade is carried out on the basis of evaluation of the impact of planned measures on the safety and economic efficiency;
- Priority – reduction of expenditures on NPPs upgrade through implementation of primary measures with the highest technical efficiency and cost effectiveness.

Heat Capacity Increase at Power Units

Capacity increase to 104% is slated for 12 operational VVER-1000 power units: 9 units in operation, 2 units in pilot commercial operation, 1 unit in preparation for testing.

NPP Unit	Beginning of Operation at 104% Capacity
Rostov NPP	
No. 1	Since 2014
No. 2	Since August 27, 2018
No. 3	Since February 2, 2018 (pilot commercial operation)
No. 4	Application sent to Rostekhnadzor for testing at 104% capacity
Kalinin NPP	
No. 1	Since November 27, 2017
No. 2	Since September 14, 2017
No. 3	Since June 8, 2018
No. 4	Since January 19, 2015 (pilot commercial operation)
Balakovo NPP	
No. 1, 2, 3, 4	Since 2014, 2011, 2013, 2016 respectively

 **942.28 bln kWh**
of electricity produced by power units with the extended service life (as of January 1, 2019)

Service Life Extension for Existing NPP Units

Service life extension (SLE) for existing NPP units is one of Rosenergoatom's priorities aimed to maintain generating capacities and increase NPP safety.

As of December 31, 2018, there were 27 NPP units with extended service life under operation with the total installed capacity of 18.8 GW. In 2018, service life extension was completed, licenses and their applicability conditions were obtained for an additional period for the Balakovo NPP unit No. 3, the Novovoronezh NPP unit No. 4, and the Kola NPP unit No. 1.

Pursuant to the updated Program for Service Life Extension at Operational NPP Units for 2013-2023:

- Technical capability, safety and feasibility of the Beloyarsk NPP unit No.3 SLE were assessed a Resolution was issued on Further Operation of Power Unit No. 3 After Expiry of Additional Service Life;
- Integrated survey of the systems and elements was performed at the Bilibino NPP units No. 2-4, equipment resource characteristics are under examination.

NPP Units Planned for Service Life Extension¹

NPP	Unit No.	Reactor Type	Commissioning Year	Design Service Life Expiry, Year	Planned Expiry of Additional Service Life, Year	First Extended Service Life Expiry, Year
Balakovo	4	VVER-1000	1993	2023	2053	–
Smolensk	3	RBMK-1000	1990	2019	2034	–
Kola ²	2	VVER-440	1974	2004	2034	2019

¹ In line with the Russian Federation Government-Supported Program for Development of Nuclear Industry Complex in 2019-2023.
² Repeated SLE is planned for another 45 years (the previous operation license for 15 years expires).

NPP Power Units Decommissioning

656.55 t
of metal removed from radiation
control for unlimited use

NPP units decommissioning operations are carried out by the Company's specialized branch – Pilot and Demonstration Engineering Center.

Pursuant to the existing Rostekhnadzor license, the decommissioning operations continued at the Novovoronezh NPP units No. 1 and No. 2 in 2018. Reference experience was gained in disassembling and fragmentation of the steam generation at the power unit No. 1, application of robotic tools during fragmentation of the transport and handling equipment. Commissioning infrastructure at the Novovoronezh NPP units No. 1 and No. 2 was improved as related to commissioning of the solid radioactive waste partitioning assembly, shotblast decontamination system, interim storage site of 'clean' scrap metal, radioactive waste accounting and control system, control current system for accumulator batteries and control switches.

A program was approved for creation of technologies for highly-active equipment during the commissioning of the VVER reactor units (VVER-210, 365, 440), a patent was received for

the Radioactive Waste Treatment Plant (RWTP).

In 2018, the Company became member of the comprehensive program for decommissioning (CPD) of the OECD with the following project: Novovoronezh NPP Power Units No. 1 and No. 2 Decommissioning.

Target indicators set for 2018 were achieved:

- LRW treated in the amount of 351.8 m³;
- SRW treated in the amount of 1,461 m³;
- Equipment and construction structures disassembled (1,317.6 t),
- Metal structures decontaminated (738 t),
- 656.55 t of metal removed from radiation control for unlimited use (600 t sold out of them);
- government contract fulfilled for treatment of RAW being under federal ownership: 265 m³ – liquid RAW and 950 m³ – solid RAW.

50 days
was the total
optimization of repairs
(-76.5 days 2017/2018)

Maintenance Campaign Results

The goal of the Company's maintenance operations strategy is to support the working capacity of NPP systems and equipment in order to ensure safe, reliable and cost-effective operation of nuclear plants in accordance with the standards and rules applicable to the nuclear power industry.

In 2018, 31 NPP units underwent 36 maintenance operations with the actual duration of 2,571 days. Meanwhile, the scheduled duration totaled 2,621 days according to the approved annual schedule of Russian NPP units maintenance in 2018.

Optimization of maintenance duration by 50 days in total became possible due to the following:

- Targeted search and removal of downtimes during scheduled repairs as a part of the RPS development;
- Conservative approach to compilation of power units maintenance schedules providing for slack time to eliminate potential defects; absence of the defects influencing the duration of the critical maintenance path.

Additional output due to NPP equipment maintenance operations optimization, including implementation of five stationary RPS projects reached some 2.1 bln kWh in 2018.

The Annual Maintenance Schedule of Russian NPPs for 2019 was developed by the Company and approved by its CEO in 2018. With a view to improve the quality of long-term planning of NPP maintenance and repair, the Company developed a long-term schedule of Russian NPP units maintenance for 2020-2029.

Rosatom Production System (RPS) Implementation

₽ 1,670 mln rubles

The economic effect of implemented RPS projects and improvement proposals

In order to fulfill the business indicators set before the Company by Rosatom State Corporation, gradually increase the efficiency of activities and further develop the Power Engineering Division, a three-year Program for Rosatom Production System Development by Power Engineering Division in 2017-2019 was compiled¹.

The division implemented 669 RPS projects and 3,654 improvement proposals in 2018: the processes duration was optimized by 1,288 days.

A package of guidelines was developed in 2018 to define the approaches to the RPS implementation with due regard to the peculiarities of the division-level enterprises.

The economic effect of implemented RPS projects and improvement proposals totaled 1,670 mln rubles, including:

- RPS projects – 1,601 mln rubles;
- Improvement proposals – 69 mln rubles.

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Energy Saving and Energy Efficiency Enhancement

⚡ 116.33 mln rubles

were saved owing to reduced energy resource consumption in 2018 in the conditions comparable to those of 2015²

As a result of the Consolidated Program for Energy Saving and Energy Efficiency Improvement, were saved owing to reduced energy resource consumption in 2018 in the conditions comparable to those of 2015².

The Consolidated Program for Energy Saving and Energy Efficiency Improvement was implemented at operational NPPs in the scheduled volume of 1.07 bln rubles in 2018. The Company's energy management system meets the ISO 50001:2011 international standard.

Work continued in 2018 to upgrade the lighting systems with LEDs, reduce heat losses in heat supply systems, weatherize external walls of NPP buildings and structures, change heat insulation with a high-efficiency heat insulating coating.

Upgraded were low-pressure and high-pressure casings of the Balakovo NPP unit No. 2, and high-pressure heaters at the Beloyarsk NPP unit No. 3 and the Kalinin NPP units No. 1-3.

Electrical equipment was also upgraded, including the generator circuit-breakers at the Kola NPP, voltage transformers at the Kalinin, Kursk NPPs, oil-filled current transformers and high-voltage circuit-breakers at the Novovoronezh NPP, excess voltage suppressors and voltage limiters at the Smolensk NPP, on-load tap changers at the Novovoronezh and Smolensk NPPs, protective relays and automation devices at the Smolensk and Beloyarsk NPPs.

² Calculated on the basis of the Guidelines for Saving of Funds Received from Reduced Energy Resource Consumption at Rosenergoatom NPPs.

In 2018, the Company successfully achieved the target cost saving indicator due to the reduction of energy resources consumption in the conditions comparable to those of the reference year of 2015. This indicator reached 5.78% in 2018. Saving of power, heat, water and effluents totaled 2.69% (23.483 mln kWh), 4.63% (16.4 Gcal), 8.24% (11.115 mln m³) and 12.8% (468.66 thousand m³) respectively in comparable conditions of the allocated volume in 2018.

In 2018, the turbine generator and high-voltage transformer bushings were upgraded at the Belayarsk NPP unit No. 4 as part of preparations for reactor unit power ascension to 107%, which enabled scheduling of tests for 2019.

The mentioned measures are aimed at raising the safety and reliability of the main equipment operation, inter alia, by

means of decreasing the failure rate, duration of scheduled / unscheduled repairs, and ensure higher energy efficiency of power units operation. Owing to the growth of the power output volume and implementation of measures aimed at reducing energy resources consumption and losses, the Company fulfills the objectives related to energy resource saving.

2.2. Sci-Tech Policy. Innovations

In 2018, Rosatom State Corporation approved the Basic Provisions of The Russian Federation Nuclear Power Industry Development until 2050 and Prospects until 2100 shaping the goals, principles and ways of the domestic nuclear industry development. The Nuclear Industry Development Strategy (Strategy 2018) was approved. The document is aimed at organization and

planning of Rosatom operations for development of the nuclear power industry technologies and ensuring its competitive ability.

Volume of Energy Resources Consumed by Rosenergoatom in 2018

Item	Units of Measurement	In Kind	Amount, Thousand Rubles
Nuclear power (used as a fuel)	Fuel assemblies, pcs	4,758	*1
Automotive gasoline	t	179	9,604
Diesel fuel	t	5,007	242,865
Fuel oil	t	16,100	248,114
Gas (natural)	m ³	338,644	8,446
Oil, carbon, shale oil, and peat	Not purchased		

Among the primary objectives of the Company's innovative development is to improve competitive ability of the products and services at nuclear power markets by means of upgrade of the existing technologies and re-equipment of the production capacities with dew regard to the Forecast of Sci-Tech Development of The Russian Federation until 2030.

Innovative Projects

Power Units with VVER-Type Reactors

Commissioning of the Rostov NPP unit No. 4 (VVER-1000) and the Leningrad NPP-2 unit No. 1 (VVER-1200) became a major event of 2018.

The water-cooled pressurized reactor (VVER) technology is a practical basis of the nuclear industry and an important part of it in the decades to come both in Russia and worldwide, as well as a guarantee of the Russian reactor technology presence in the international market.

One of the targets is to introduce the NPP unit with the electrical output of 1,255 MW streamlined for a higher market appeal of the VVER-TOI project, which is an advancement of the VVER-1200 projects (NPP-2006 project).

In 2018, the Program for Streamlining of Design Solutions of Traditional VVER Technology was approved with a view to optimize VVER-1200 and VVER-TOI NPP design solutions taking into account the experience gained in construction, start-up and operation of VVER

technology nuclear power plants at domestic and foreign sites.

The Rostov NPP unit No. 4 (VVER-1000) and the Leningrad NPP-2 unit No. 1 (VVER-1200) were put into operation in 2018.

New power units construction operations are ongoing at a rapid pace. See more details in Section 2.1 – Generating Capacities.

 **BN-800** power unit is a most important element of CNFC technologies approbation for fast neutron reactors.

At present, Russia is a recognized leader in sodium-cooled fast reactors operation.

BN-1200. Power Units with BN-Type Reactors

In order to demonstrate sustained operation of a whole range of facilities ensuring closure of the nuclear fuel cycle, a commercial fast neutron reactor cooled by sodium (BN-1200M) with improved feasibility characteristics, and nuclear fuel cycle closure technologies are under development.

Basic technologies for the two-component nuclear power system are approbated during pilot commercial operation of the Beloyarsk NPP energy complex (power units No. 3 with BN-600 reactor and No. 4 with BN-800) in combination with the existing fuel production (GKhK, GNTs NIIAR), SNF reprocessing, SNF and RAW handling facilities (PO Mayak, Pilot and Demonstration Center of GKhK), as well as those being created.

Power units with BN-600 and BN-800 fast neutron reactors operating in the power generation mode are also used for implementation of sci-tech programs in the following areas:

- Reduction of specific costs for nuclear fuel of BN reactors by means of increasing the efficiency of fuel use with application of new structural materials (deeper fuel burn-up and longer use);
- Shaping of BN-800 reactor core fully loaded with uranium-plutonium fuel (MOX fuel);
- Preparation of the SNF handling infrastructure for large-scale reprocessing of MOX fuel from BN reactors, and approbation of innovative CNFC technologies (e.g., long-life RAW (so called minor actinides) burn-up technology).

In 2018, the following measures were taken in the said areas:

- Large-scale introduction of fuel assemblies featuring a 592-day lifetime with EK-164 steel fuel cells. Fuel assemblies meeting new specifications have been supplied from summer 2018;
- Preparation of an amended R&D Program for fuel make-up in a power unit fully loaded with MOX fuel at the Beloyarsk NPP unit No. 4 (BN-800) and its approval by Rosatom top management;
- Development of a comprehensive program for computational and experimental substantiation of MOX fuel use;
- Issuance of a resolution for development of fuel assemblies with an axial interlayer of depleted uranium.

A whole range of sci-tech programs to be implemented at BN-800 reactors evidences that the power unit is becoming an important element of CNFC technologies approbation for fast neutron reactors.

In 2018, the following aspects were approved: the terms of reference for BN-1200M reactor unit and the terms of reference for design documents development for the Beloyarsk NPP unit No. 5 with due regard to operation within a two-component nuclear power system.

Small Nuclear Power Plants (SNPP)

Creation of SNPPs may be considered an important factor for development of the economic potential of distant regions lacking extensive electricity transmission lines, energy supply to ore mining, processing and concentration enterprises, as well as emergency autonomous energy sources in large energy systems. With a view to supply energy to the projects implemented in the Arctic region (inter alia, reduce the risks of dependence on distributed power generation in remote and hard-to-reach areas), work is underway to create a series of small NPPs with reactor units of various types and capacity, as well as alternative energy units.

Floating Nuclear Power Plant (FNPP)¹

The world’s first floating nuclear power plant (FNPP) Academician Lomonosov equipped with two KLT-40S reactors is a unique low-power unit based on marine reactor technologies. In 2018, the floating power unit construction and its unique transportation from Saint Petersburg to Murmansk were completed, where the reactor units, systems and equipment start-up operations were performed. In addition, construction work was underway at onshore infrastructure facilities of the FNPP in Pevek in 2018. The FNPP transportation to Pevek, Chukotka Autonomous Okrug is scheduled for 2019.

High-Temperature Gas-Cooled Reactors (HTGCR)

In 2018, Rosatom State Corporation set a course to building up the hydrogen energy as one of its priorities in sci-tech development with a focus on hydrogen production driven by efficient power and heat generation by nuclear power engineering plants (NPEP).

Hydrogen energy becomes a global trend, and the market of hydrogen and hydrogen technologies demonstrates a clear trend for expansion. Many big countries pay more and more attention to hydrogen as a versatile and most promising energy agent.

R&D and Innovations Management

₽ >1.7 bln rubles were channeled for R&D funding as part of the Company’s Consolidated Investment Program in 2018.

The Program for Innovative Development and Technological Upgrade of Rosatom State Corporation Up to 2030 (Civil Part) is a main tool of innovations management.

With a view to update this program, the level of technological advancement of Rosatom State Corporation was compared to the leading domestic and international peers (technology audit) in 2018.

Rosenergoatom prioritizes innovative development through technologies and competencies primarily created during the R&D ordered by the Company. R&D plans are implemented as part of the Company’s investment program. On the basis of the Long-Term Investment

Program, the Company annually compiles three-year and annual R&D plans. The approved spending target is stated in the respective section of the Integrated Investment Program of the Company for the planning year.

The nuclear industry is the leader in terms of the number and the level of sci-tech developments in engineering and construction of new NPP power units, creation of new nuclear fuel, extension of the operational NPP life cycles and boosting of the power units capacity.

R&D funding as a Part of Rosenergoatom Investment Program, Bln Rubles



¹ Detailed information regarding the FNPP is provided in 2017 Rosenergoatom Annual Report, Pages 92-93

In 2018, the main R&D efforts were taken in the following areas:

- Developing, verifying, validating calculation codes used for substantiation of design and engineering solutions;
- Metallurgical issues of extending the service life of the primary cooling circuit equipment of VVER-type NPPs up to 60 years and substantiation of their design capacity;
- Substantiating VVER-TOI design solutions, preparations for the Kursk NPP-2 construction on the basis of this project;
- Substantiating the design of power units with high-power fast neutron reactors;
- Substantiating the extension of BN-type reactor fuel lifecycles;



- Implementing the comprehensive R&D program for prevention and management of severe accidents at VVER-type NPPs compiled on the basis of Rostekhnadzor comments analysis;



- Creating and operating the Virtual NPP software and hardware complex enabling to forecast, analyze and assess the risks of severe accidents during operation of the power units constructed in line with the VVER-1200 design.

In order to unify the rules and principles of the knowledge management activities and distribute the structural units' roles, Rosenergoatom developed the Regulation on Corporate Knowledge Management System, which was enacted by a respective order.

Passports of the Innovations Management and the R&D Management processes were developed in 2018 as part of the integrated management system (IMS) implementation in the Company.

Intellectual Property (IP)

With a view to increase the share of intellectual product in the final value of sci-tech activity results, the Company continuously performs technology audit: measures to create and identify potentially protectable intellectual property (hereinafter – IP).

Rosenergoatom Intellectual Property Portfolio

Exclusive rights to IP	299
<i>including</i>	
• Invention patents	71
• Utility model patents	20
• Software and databases Of them holding Rospatent certificates of state registration	208
– Software	19
– Databases	1
Registered trademarks	4
Know-hows	22

In 2018, work continued for continuous adaptation and replenishment of the industry-level information system for intellectual property rights management (ISIPRM) – the main tool of IP management, as it refers to prompt updating of the information regarding the Company's IP. The ISIPRM integrates all processes and procedures for intellectual property management applied in the nuclear power industry and stipulated by the applicable laws and local regulations of Rosatom State Corporation. The system creates a single information medium for intellectual property rights management within the nuclear power industry.

 **41 IP assets**
(inventions and software items)
worth 714,911 mln rubles in total

Applications Filed in 2016-2018

Item	2016	2017	2018
Invention patents obtained in the Russian Federation	1	7	9
Utility model patents obtained in the Russian Federation	1	1	0
Certificates of trademark registration obtained	0	0	0
Applications for invention patents filed in the Russian Federation	8	8	8
Applications for utility model patents filed in the Russian Federation	0	0	0
Applications for trademark registration filed	0	0	4
Applications for software and database registration filed	4	6	6
State registration certificates for software obtained	4	5	7
State registration certificates for databases obtained	1	0	0
Know-hows executed	5	11	0
Foreign applications filed, including PCT	0	6	79

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2.3. Digitalization Program

Participating in the state-run program for the economy development (the Russian Federation Digital Economy¹), Rosatom State Corporation has developed a Unified Digital Strategy, which is a most important step towards acceleration of the digital transformation of the industry, promotion of import substitution, discharge of obligations towards the state as part of the national program implementation and development of civil products by defense industry enterprises.

The Strategy prioritizes digitalization of main internal processes and corporate functions, development and market launch of Rosatom's digital products, participation of the State Corporation in development of the digital economy, particularly in creation of innovative centers for comprehensive technologies.



The Company is guided by the Unified Digital Strategy of Rosatom along the way to digitalization. The Company has developed and is implementing the **Program for Digitalization of the Power Engineering Division of Rosatom for 2018-2022**, which is focused on Digital Energy, Digital NPP, and Digital Products.

¹ Approved by the Russian Federation Government Directive No. 1632-r dated July 28, 2017. Details of the program may be found at: www.government.ru

A concept of the distributed ledger (blockchain) technology in the electricity market (from the viewpoint of NPPs) was developed and approved, the existing barriers were defined, and the conditions feasible for implementation of this technology, as well as the effects of its introduction.

Russian and international experience of digital technologies application in the energy sector was studied in the reporting year. The Company was active in shaping the agenda of the digital power sector on the sectoral level. Key development areas were synchronized as part of interaction with the Russian Energy Ministry, Energynet NTI, SO UES, major power producers and grid operators.



The Company became one of the participants of the Russian Energy Ministry program for digital transformation of the industry (with a project for predicative analysis of the generating equipment operation). Projects were initiated to develop the systems for measurement and diagnostics of operational parameters of electrical plant equipment with the use of digital data processing technologies. Development of the specified systems is a necessary step on the way to a risk-oriented approach to the energy system management.

Digitalization allows for reduction in expenses for and costs of energy resources, increases the reliability and efficiency of the energy system owing to creation of risk oriented management on the basis of information technologies, ensures a common access to data, which undoubtedly makes the Company highly competitive in the energy market. Being a modern high-tech company, Rosenergoatom remains up-to-date with the market changes and environment.

Prospects for 2019

The Russian Federation Energy Ministry shaped the industry-level project of Digital Energy with a key organizational objective of building up the system of digital transformation of the Russian fuel and energy complex. Therefore, the project stipulates creation of industry-level centers of competencies for digital transformation, and a Council for Digital Transformation of Fuel and Energy Complex headed by the Russian Federation Energy Minister. Creation of one of such centers of competencies in the form of an association of organizations for digital development of the power sector, Digital Energy, is scheduled for 2019.

Another important area of digitalization hinges on implementation and market launch of the Company's new products. A key project is the Kalinin NPP DPC put into operation in 2018¹.

¹ Detailed information is provided in Section 2.5 – International Business and New Products.

Information Technology

The SAP ERP project implementation in 2018 made the Company the winner of the SAP Quality Award 2018 in the Business Transformation nomination among CIS countries.

Commissioning of the consolidated reporting system stage 2 in 2018 enables prompt reporting on the basis of reliable information from the SAP ERP resource management system. Work continued to create managers' information panels for monitoring of the indicators related to various activities.

Pilot Areas of Rosenergoatom Digitalization

02

Digital Sub-station



- Digital measuring devices, protection relays and emergency control automatics
- Corporate governance
- Vector measurement systems
- Electrical equipment diagnostics



01

Decision Making Systems. Predictive Management

- Data processing systems (Big Data, AI)
- Digital clone
- Digital operation pattern
- Digital advisors, assistants

04

Ultimate Consumer Relations

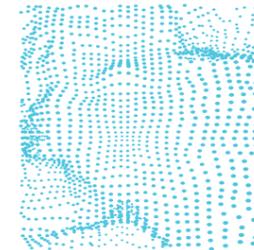


- Consumer management
- Smart city (power supply)
- Smart home
- Energy audit and energy management

03

Operational Activity

- Blockchain, smart contracts
- Virtual training, augmented reality
- Power accumulators



Nuclear Power Plant

Data Processing Center

Nuclear Power Plant Data Processing Center Smart City

Digitalization

The Digital Energy sector involved 7 projects in 2018



01

Robotization of the commercial accounting of electricity

Goal

Removing personnel and eliminating human factors from the process of commercial accounting of electricity in the market for settlement of payments for supplied electricity



Result of 2018
Terms of reference for the work were prepared and approved

02

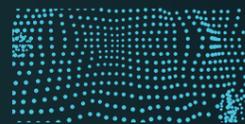
Creation of the Center for Decision Making by the generating company on the basis of digital technologies

Goal

Creation of an analytical tool for making mid-term and long-term decisions by the Company's top management in the environment of rapidly changing external factors and limited time through the use of Big Data and Artificial Intellect technologies.



Result of 2018
Design documentation was prepared, functionality testing was performed for software Stage 1



03

Introduction of a system of predictive analysis at the level of NPP electrical equipment

Goal

Transfer to condition-based repair of NPP electrical equipment (minimization of the number of breakdown repairs due to their identification at earlier stages and transfer to emergency, unscheduled or scheduled repairs).

Result of 2018
Terms of reference developed and approved for the system

04

Development of a technology for synchronized vector measurement of electric parameters of NPPs operation

Goal

Increasing the reliability of the NPP power distribution scheme, minimizing the losses arising from unscheduled and emergency shut-down of NPP units due to failure/malfunction of electrical equipment of the secondary measuring equipment



Result of 2018
The project terms of reference were approved (coordinated with all NPPs and the Company), the procurement procedure was initiated

05

A pioneer business in the Russian energy system – digital price-responsive management of power consumption

Goal

Leveling of consumption in the energy system throughout a day (NPP does not have to perform daily power regulation, NPP power limits are minimized in certain patterns)

Result of 2018
The largest scale experiment for retail customers' demand management in the Russian energy system was successfully passed

Upon completion of the pilot period, a new player will appear in the energy market – a consumer load aggregator.

06

Smart City (in terms of power supply)

The Company's goal

Approbation of adaptive and intelligent technologies for management of energy resources (electricity, heat and water supply) of municipal entities and large consumers

Rosatom goal

Shaping of a new business, a new digital service as a part of the Smart City.

Result of 2018
Shaping of the project boundaries



07



Digital switching device for the NPP power distribution scheme (analogue to a digital sub-station)

The Company goal

Increasing the reliability of NPP electrical equipment after introduction of a new digital solution, gaining experience in operation of digital measuring transformers, digital relay protection, evaluating the economic effect of conversion to digital switching devices, replicating technologies at other facilities.

Rosatom goal

To create a new product, Digital Sub-Station, to be sold to generating and grid companies in Russia, and foreign partners.

Result of 2018
A concept of the NPP switching device digitalization was approved, pre-projects studies of the pilot site were performed

2019

Project completion

Q4 2019

2020

Q2 2020

Q4 2020

2021

2022

2023

Import Substitution of IT Systems

The strategy for import substitution of the Company's IT systems stipulates development of import-independent solutions in three major areas:

- 1) Substitution of significant categories of the critical information infrastructure objects in accordance with the Federal Law 187-FZ on Security of Critical Information Infrastructure of the Russian Federation;
- 2) Development of proprietary solutions, taking into account the experience of application of the best foreign IT solutions, inter alia, by the Company, and gradual replacement of imported platforms with the in-house developments meeting all criteria of scalability, safety and reliability;
- 3) Prioritized use of import-independent solutions in new projects for digitalization of the Company (in compliance with the requirements for functionality, reliability/safety, total cost of ownership). In this case, the Company acts as the pilot benchmark facility and substantiates the absence of influence on

the operational safety of the nuclear industry facilities;

Thus, a project was initiated in 2018 for substitution of the technical support system for IT services users – HP Service Desk with Naumen Service Desk supplied by a Russian company Naumen Consulting. Processes were introduced to improve the quality of IT services (incidents, service requests management).

In addition, the Kola NPP launched a pilot project for ensuring industrial safety in relation to control of the individual safety gear using computer vision based on import-independent software.

A project is underway to convert the spam filtration system to Kaspersky Secure Mail Gateway.

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2.4. International Sci-Tech Cooperation

Increasing the share on international markets and developing new products on international markets are the strategic goals of the Division and Rosatom State Corporation in the short and long term periods. Achievement of these goals is impossible without fruitful sci-tech cooperation with international organizations and strategic partners.

Key Events of 2018



- 11th International Sci-Tech Conference – Nuclear Industry Safety, Efficiency and Economics. Participating in the conference were over 1,000 representatives of the industry-level domestic and foreign organizations, including 62 delegates from 22 countries of the world
- Comprehensive emergency drill at the Balakovo NPP attended by 18 foreign observers
- International insurance inspections at the Bilibino and Kalinin NPPs
- 8th review meeting for consideration of the Convention on Nuclear Safety
- Meetings of steering and coordinating committees with major partners: WANO, EUR, EDF, Nordic Countries



Cooperation with IAEA:

- Corporate OSART mission
- 3rd International IAEA Conference on Human Resource Development for Nuclear Power Programmes: Meeting Challenges to Ensure Future Nuclear Workforce Capability (the Company's conference paper)
- Review meeting of the IAEA Technical Work Group on NPPs operation issues

Cooperation with WANO:

- Peer reviews at the Kalinin and Leningrad NPPs
- Follow-up peer reviews at the Beloyarsk and Novovoronezh NPPs
- Pre-launch follow-up peer reviews at the Novovoronezh NPP
- International Conference of Technical Managers of Operating Companies and Chief Engineers of NPPs
- Forum of Technical Top Managers

Membership in International Organizations



- International Atomic Energy Agency (IAEA)*
- World Association of Nuclear Operators (WANO)
- Materials Ageing Institute (MAI) under the auspices of EDF
- European Utility Requirements (EUR)
- Nuclear Energy Agency under the Organization for Economic Cooperation and Development (NEA/OECD)¹

¹ The Russian Federation is a member of the Agency; Rosenergoatom participates in activities under the auspices of the Agency via an authorized organization – Rosatom State Corporation.



Safety – unique practice

As a part of the IAEA Operational Safety Review Team programs, a Corporate OSART Mission was held at the Company in November 2018. The Mission was aimed at reviewing the operating organization's activities influencing the operational safety of NPPs.

A team of international experts identified three examples of good practice and produced one recommendation and five proposals, that the Company is planning to implement before the check-up visit of the CM of OSART scheduled for 2020.

International Organizations



IAEA

In 2018, the Company actively participated in preparations for another national report of the Russian Federation on discharge of the obligations arising from the Convention on Nuclear Safety (CNS). During the 8th Review Meeting of the CNS, a representative of the Company was elected as the country team leader.

During 2018, preparations continued for the OSART mission at the Kalinin NPP (2020), involving international experts,

inter alia, as a part of the current agreement with the IAEA. A similar agreement was made in favor of the Beloyarsk NPP that already started preparations for the OSART mission (2021).

As a part of cooperation with the IAEA, 19 international events were held at the Company's Headquarters and branches, and Rosenergoatom employees participated in 17 IAEA events abroad in 2018.



European Utility Requirements (EUR)

In general, the VVER-TOI reactor project evaluation was completed by EUR in 2018¹. The evaluation was performed by the EUR members: Electricite de France (France) – technical leader of evaluation, GEN energija (Slovenia), MVM Paks (Hungary), ČEZ (Czech Republic). According to the evaluation results, the VVER-TOI project met the EUR requirements Version D. In 2018, the Company joined the evaluation of the HPR 1000 project of the Chinese CGN, the technical leader of evaluation was ČEZ.



Nuclear Energy Agency under Organization for Economic Cooperation and Development (NEA/OECD)

A representative of the company has been a member of the Radiological Protection and Human Aspects of Nuclear Safety team of the NEA/OECD Secretariat since 2014. In addition, Rosenergoatom participated in the NEA/OECD project for the International Information System on Occupational Exposure (ISOE). Data is submitted to the ISOE by authorized representatives of the power plants (Balakovo, Kola, Kalinin, Novovoronezh and Rostov NPPs).



WANO

In 2018, the Company's top management participated in all major events of the WANO (meetings of Governing Board, the International Conference of the WANO Moscow Center Directors, the International Council of Technical Managers of Operating Companies and NPPs, the Forum of Technical Top Managers).

In 2018, the Russian nuclear plants were attended by:

- 3 large-scale peer reviews (with a design information component);
- 2 follow-up peer reviews;
- 1 pre-launch peer review by the WANO.

A key initiative of 2018 continued in holding a complex of measures in the area of safety culture: a support mission at the Company's headquarters and three nuclear plants for check-up of the status and improvement of the level of safety culture, and training workshops for all NPPs held on a regular basis.

In 2018, the Company continued operation of the WANO Regional Crisis Center (hereinafter - RCC) on the basis of the Company's Crisis Center: 11 international emergency drills were held with participation of the RCC.

Representatives of the Company's Headquarters and NPPs participated in

the activities of 6 international industry-level task forces of the WANO London Office in the following areas: human factor, equipment reliability, independent nuclear supervision, promotion of new units, production indicators, APCS.

Rosenergoatom further supported the activities of the WANO Moscow Center representatives at the Company's NPP sites.

In the reporting year, the Company was also an active participant of the WANO Reorganization project stipulating creation of the fifth regional WANO center in Shanghai, PRC.

Strategic Partners

Spain – Iberdrola

Partnership relations with Iberdrola are maintained within the tri-lateral Memorandum of Cooperation dated October 4, 2018 between the Company, VNIIAES and Iberdrola Nuclear Generation. The main result of 2018 was information exchange in such important areas for the Company as RAW management and decommissioning, creation of a virtual NPP, hydrogen explosion safety, power storages.

France – Electricite de France, EDF

Interaction is governed by the Cooperation Agreement between the Company and EDF of April 21, 2016 made for a period of three years. An accord was reached at the meeting of the Company's Coordinating Committee for Cooperation between Rosenergoatom and EDF dated December 11, 2018 to extend the said agreement for another three-year period by the signing of an Extension Protocol to be linked to celebrations of the 25th anniversary of cooperation between Rosenergoatom and EDF in 2019. 22 events were held as part of the joint program in total in 2018.

The Graphite Reactors Dismantling cooperation was started in 2018 as part of the Decommissioning and Waste Management efforts, and a Memorandum of Innovative Cooperation Development was signed between Rosatom State Corporation and EDF in June 2018.

Cooperation with Nordic Countries (Norway, Finland and Sweden)

As part of existing agreements, cooperation of the Leningrad and Kola NPPs was furthered with SSM (Sweden), STUK (Finland), and IPE/NRPA (Norway).

The projects of 2018 were implemented in the areas of technical diagnostics, non-destructive testing, RAW management and decommissioning, including radiation control.



IAEA

¹ EUR is the European Utility Requirements shaping a framework for development of design requirements for new nuclear power plants.

2.5. International Business and New Products

Development of new products and expansion of foreign presence are the strategic priorities of Rosatom State Corporation. The Company was active in pursuing these goals in the reporting year.



Establishment of a Business Laboratory was an important event of 2018. The Laboratory aims at finding and creating new products. It is based on a huge intellectual potential and production experience of the Company. As part of the project, two training modules were held and a pool of promising ideas of new products was created in 2018.

Rosenergoatom is one of the key participants of the integrated proposal of Rosatom State Corporation in international markets of NPPs construction, the Company is involved in every stage of the NPP life cycle from rendering assistance in creation of the nuclear infrastructure to decommissioning.

New Businesses Development

The Company's new business lines portfolio contains six major areas surrounding mainly the Division's core activities, and several new businesses focused on their diversification and support.

NPP Service Abroad

NPP Servicing Abroad is an important strategic initiative of the Division, which is coordinated in the Company by the International Business and Development Department. Rusatom Service, a subsidiary of the Company, is a single industry-level integrator of NPP service supplies abroad providing foreign customers with an easier access to a wide range of services provided by the Power Engineering Division, it is present in 15 countries of the world and renders its services at 41 operational VVER-type NPP units outside Russia.

Electricity Distribution

AtomEnergSbyt continued operations under the status of the 'last resort supplier' of power in the Kursk, Tver, Smolensk, and Murmansk Oblasts through established branches and standalone structural units in 2018. For more information on AtomEnergSbyt's operations see Section 1.5. Situation in Electric Power Industry (Retain Distribution).

Data Processing Center



Construction of the Company's Data Processing and Storage Center (DPC) at the site located near the Kalinin NPP is a strategic priority of Rosenergoatom. Implementation of the project became a milestone of 2018 as it is included into the Russian Federation Digital Economy program, and a list of prioritized projects of Rosatom State Corporation due to the fact that it is the largest DPC being created in Russia and one of the largest worldwide. The DPC objective is to implement a proprietary disaster-proof system for the production process data processing and storage, as well as to diversify the business portfolio and help the Company master data processing and storage services.

In 2018, the DPC Stage 1 facilities construction and commissioning was completed with the total delivered power of 48 MW, including two DPC buildings, an administrative building, a checkpoint building, electricity supply system facilities for the Company's proprietary disaster-proof system of data processing and storage, equipment of industry-level enterprises and commercial customers with the capacity of up to 800 racks of

IT equipment (in October 2018 the Company launched a commercial service of hosting the equipment of an external commercial customer in the DPC equipment rooms).

As a part of the DPC Stage 2 implementation, a project was launched to construct the infrastructural site for allocation of modular/container computers. The site preparation engineering was completed in 2018, the final stage stipulates obtaining a positive conclusion of the expert review of design documents. The first container computers commissioning is scheduled for August 2019.



Creation of a network of data centers will ensure equal access of the Russian Federation citizen to digital government services, and a high level of the system reliability. One of the social goals of the DPC project is to raise the investment attractiveness of the location region (Tver Oblast), create new jobs, improve the quality of people's life in the areas of Rosenergoatom presence.

Results of New Business Lines Development According to Key Indicators in 2017–2018

Business Line	Revenues from new products (outside Rosatom State Corporation circuit), bln rubles		Portfolio of new product orders for the period of 10 years (outside Rosatom State Corporation circuit), bln rubles	
	2017	2018	2017	2018
NPP Servicing Abroad	4.66	13.11	48.44	46.71
Penetration of B2B and B2C segments with new products	0.12	0.12	–	–
Electricity Marketing (Supplier of Last Resort)	55.33	58.10	–	–
DPC	0.00	0.28	–	–
TOTAL	60.11	71.62	48.44	46.71

Basic Products Supply in NPP Service Abroad

Nuclear infrastructure



Nuclear infrastructure

Existing projects

- Zambia
- Bolivia

Short term and medium term

- Bangladesh
- Egypt
- Turkey

Construction



Simulators

- Bangladesh
- China

- Hungary
- Egypt



Personnel
training

- Turkey
- Belarus



Owner's
Engineer

- Finland
- Slovakia



Commissioning

Operation



Operation

- Armenia
- India
- Slovakia



Service

- Egypt
- Bulgaria
- Czech Republic



Sci-tech progress

- Finland
- Hungary
- China

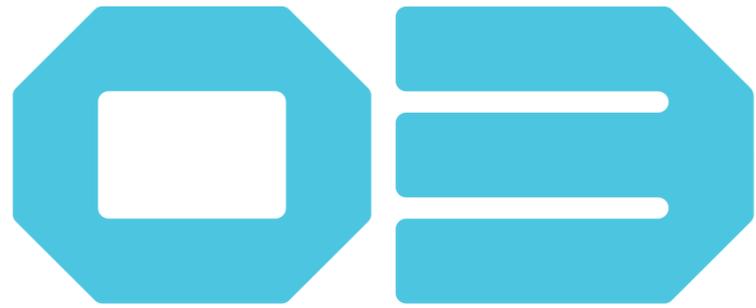
Decommissioning



Decommissioning

- Lithuania
- Bulgaria





Ensuring Safety of NPPs

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Over the recent 20 years, Russian NPPs encountered no incidents classified above the International Nuclear and Radiological Event Scale (INES) Level 1 (Anomaly).

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3.1. Ensuring Safety of Russian NPPs

Safety is an utmost priority of Rosenergoatom as the operating company. All of the Company's NPPs have been demonstrating failsafe and secure operation in every aspect of activity during the whole life cycle.



Rosenergoatom performs its activities related to providing consumers with power and heat produced by the Company's NPPs with guaranteed safety as its top business priority.

The Company consistently and purposefully discharges the obligations arising from the Convention on Nuclear Safety, accounts for the recommendations of the International Atomic Energy Agency (IAEA) safety regulations and guidelines, as well as regulations and principles of the IAEA International Nuclear Safety Group (INSAG) formulated in the Basic Safety Principles for Nuclear Power Plants, and the Safety Culture. Rosenergoatom ensured failsafe and reliable operation of Russian nuclear power plants in 2018.

Over the recent 20 years, Russian NPPs encountered no incidents classified above the International Nuclear and Radiological Event Scale (INES) Level 1 (Anomaly).



31.2 bln rubles

were spent for all programs in 2018 to improve NPPs operation safety

Results of 2018

There were no

- incidents accompanied by radiation consequences (Regulation NP-004-08), nuclear materials and radioactive substances loss
- malfunctions of safety systems that could lead to safety functions loss
- accidents and injuries at the registered hazardous facilities of the Company
- events classified as INES Level 1
- fires / inflammations

Incidents at Operating NPPs, Injuries, Unplanned Automatic Scrams, Fires/Ignitions

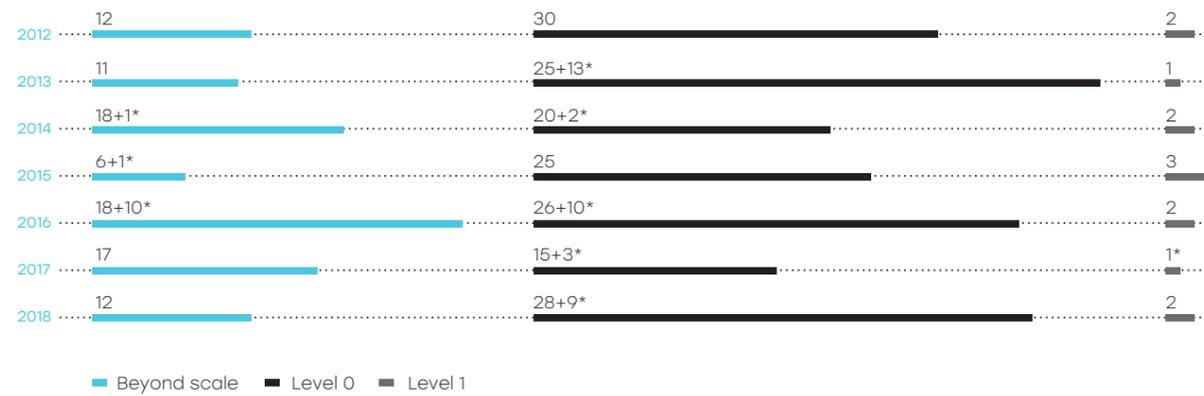
NPP	Incidents		Unplanned Automatic Scrams Critical		Injuries (Number)		Fires/Ignitions (Number)	
	2017	2018	2017	2018	2017/2018		2017/2018	
Balakovo	3	2	0	1	0	0	0	0
Beloyarsk	3	3	0	0	0	0	0	0
Bilibino	0	0	0	0	0	0	0	0
Kalinin	5	6	0	0	0	0	0	0
Kola	3	2	1	0	2	1	0	0
Kursk	3	10	0	3	0	0	0	0
Leningrad	8	10+8*	2	1+1*	0	0	0/1	0
Novovoronezh	1+4*	2	2*	0	0	0	0	0
Rostov	4	4+1*	0	0	0	0	0	0
Smolensk	3	3	0	0	0	1	0	0
Total	33+4*	42+9*	3+2*	5+1*	2	2	0/1	0

* power units under low power testing

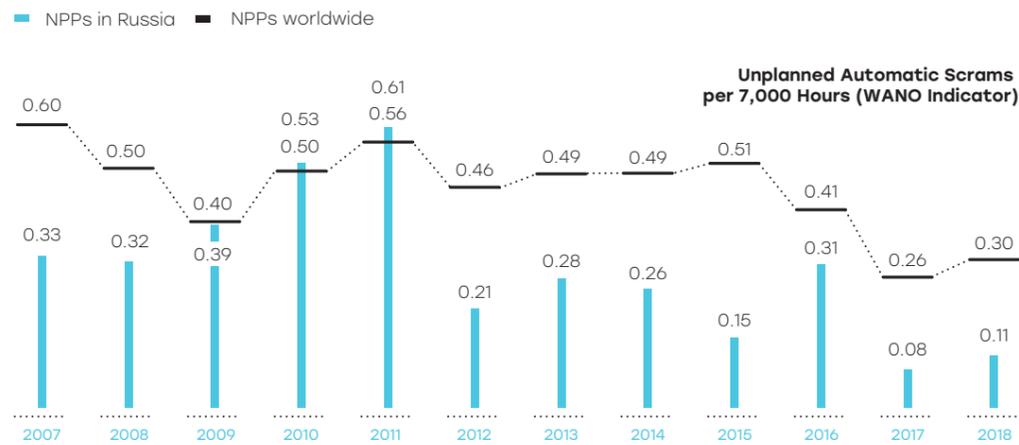
There were

- 42 incidents in NPP operations classified as INES Level 0 / Below Scale and 9* - at power units under low power testing
- 2 accidents (Kola NPP, Smolensk NPP)
- 6 unplanned automatic reactor scrams critical
- Out of them 1 – during low power testing of the Leningrad NPP-2 unit No. 1

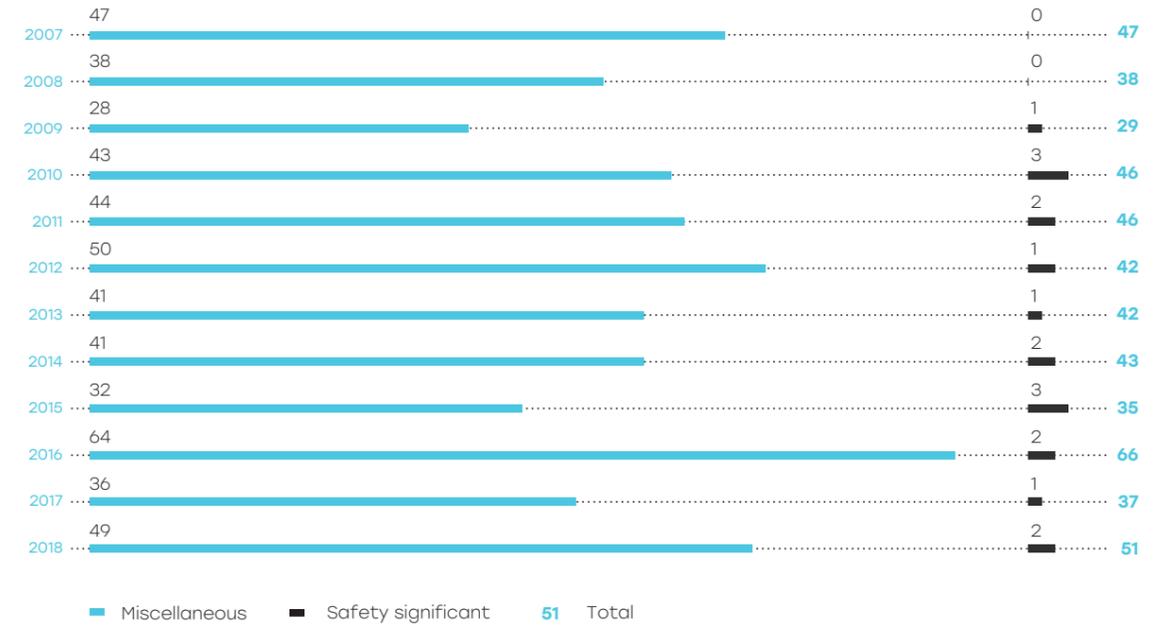
Changes in Number of INES Incidents at NPPs
* power units under low power testing



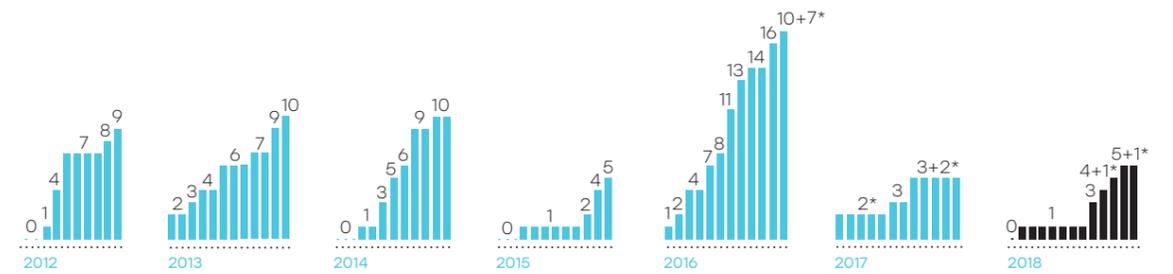
Changes in automatic reactor scrams critical



Changes in Incidents at Russian NPPs



Changes in Number of Unplanned Automatic Scrams between 2012 and 2018
* power units under low power testing



Control of Russian NPPs Safety Status



The Company held a Corporate OSART Mission of the IAEA for the first time in the corporate history in November 2018. The OSART represented by experts from Canada, China, France, Germany, Japan, Slovakia, Slovenia, the SAR and two observers from the WANO Moscow Center confirmed the Company's commitment to improving the operational safety and reliability of nuclear power plants.

Russian NPPs passed three full-scale peer reviews (with the design information component), two follow-up peer reviews, and one pre-launch peer review by the WANO in 2018. The reviews showed the areas for improvement, corrective actions and being developed and implemented.

The operating company inspects NPPs in line with the annual action plan, the

NPPs inspection schedule and the instructions given by top management of the Company and Rosatom State Corporation.

42 scheduled inspections, process audits and safety inspections were held at the existing NPPs and those under construction by the Company's commissions in 2018. In accordance with the inspection results, improvement

measures have been developed, their progress is under control and supervision.

The operating NPPs safety condition was assessed as suitable, with corrective actions needed and expedient in several functional areas at certain NPPs, and on the corporate level.

Among the considered areas were:

- Corporate governance
- Independent nuclear reactor
- Human resource
- Organizational interaction and communications
- Maintenance and repair
- Technical support
- Operation experience
- Purchases
- Emergency management and emergency preparedness

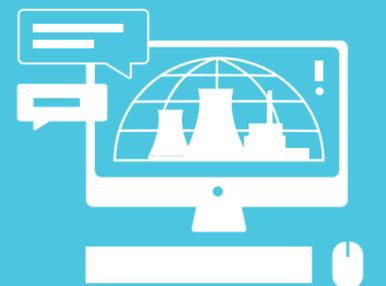
Following the results of the mission, development measures are being developed for the Company to implement before check-up review of the Corporate OSART Mission scheduled for 2020.



Corporate OSART Mission of the IAEA

The corporate OSART mission at Rosenergoatom was the third corporate mission after CEZ (Czech Republic) and EDF (France).

Corporate OSART mission results – 3 examples of good practices, 1 recommendation and 5 proposals



Increasing Safety and Stability of NPPs against Extreme External Impacts

In relation to the events which caused the Fukushima Daiichi nuclear disaster in Japan, Rosenergoatom has analyzed possible accident development scenarios at Russian nuclear power plants against extreme external impacts. The analysis results laid the basis for development and implementation of the measures aimed at improving the NPPs resistance to extreme natural and man-made impacts, including severe accidents:

- Short-term (2011-2012), mid-term (2012-2014) – completed;
- Long-term (2014-2021) – underway on schedule.

The activities scheduled for 2018 were fully completed. Each year the Company updates its activities according to the results achieved in the previous period.

Safety Culture

The safety culture is a set of characteristics and peculiarities of the organizations' activities and behavior of individual persons, which stipulates that NPP safety as a top priority is in the focus required by its importance (NP-001-15).

Rosenergoatom has defined that safety culture shaping, maintenance and development lay the basis for ensuring nuclear power plants security.

Safety culture shaping, maintenance and development lay the basis for ensuring security of Rosenergoatom nuclear power plants.

In 2018, top management of Rosenergoatom revised the Company's safety culture policy statement. The safety culture activities of the Company are aimed at shaping and development of such specific functions of the organization and behavioral features of every employee that ensure prevention of safety degradation, and constant improvement of NPP safety condition.

Development of Management Leadership and Mentorship for safety

focus area

Creating the atmosphere of trust by managers of all levels

focus area

Commitment to permanent excellence

focus area

Communications of managers as a key element of SC shaping and development measures efficiency

focus area

Priority of safety over economic and production goals

Recruitment, vocational training and proficiency maintenance among managers and personnel

Self-control of safety affecting activities by employees

Each employee's understanding that it is impermissible to cover-up mistakes, necessary to identify their reasons, study and introduce best practices

Implementation of a system of incentives and penalties, which promotes transparency of the employees' actions and absence of their mistakes cover-up

Evaluation and monitoring of the SC status

The Company has updated and is implementing the Power Engineering Division Program for Safety Culture Support and Development. The Safety Culture Development Program measures were fully completed in 2018.

The Power Engineering Division of Rosatom held the Safety Culture Development Forum in 2018. The Forum

was attended by the employees of headquarters, branches and organizations within Rosenergoatom control circuit.

Industrial Safety

No accidents and incidents at hazardous production facilities operated by the Company were registered in 2018.

Rosenergoatom pays great attention to industrial safety of NPP Hazardous Production Facilities (HPFs). As of the end of 2018, 74 hazardous production facilities¹ were registered in the industry-specific section of the state register of HPFs. With a view to reduce the risk of accidents at HPFs and improve the status of industrial safety, reactive and pro-active measures are being developed and implemented, including the Program for Improvement of Industrial Safety in Medium Term (2018-2020).

The industrial safety department held target-oriented reviews of the industrial safety level at NPPs. Centrospas Federal State Institution preparedness was checked by Rosatom representatives as part of the inter-sectoral commission for appraisal of emergency response teams.

Emergency Preparedness and Response

The Company's emergency prevention, elimination and response system currently in place meets all requirements set for the participants of the Unified State System for Emergency Prevention and Response, and corresponds to the best global practice.

In compliance with the Russian legislation, orders of the Russian Federation Government, and the IAEA recommendations, the Company created and runs the System of Prevention and Elimination of Corporate Emergencies. The NPP emergency response team immediately coordinates and actions, material and human resources during emergencies at nuclear plants. In case of emergency threats, the team works at the Company's Crisis Center premises in close cooperation with the experts

of Technical Support Centers (TSC). The TCS maintains day-and-night duty, and cooperation with the Company's Crisis Center by means of dedicated communication channels based on communication terminals, data transfer systems and teleconferences. The whole system of emergency response is based on the staggered principle of sci-tech support, material and human resources, unconditional coordination and inter-action.

The NPP emergency response team and TSCs participated in 10 fire fighting drills and exercises at nuclear plants throughout 2018.

Communications, alarm and information support systems, control centers, coordination bodies, standing control bodies, routine control, material and human resources for emergency prevention and elimination were created in order to streamline the emergency prevention system at the operational NPPs. NPPs regularly hold emergency response drills for the personnel with involvement of the Crisis Center and TSCs, as well as command team exercises, comprehensive and special tactical training for emergency prevention and elimination forces and equipment.

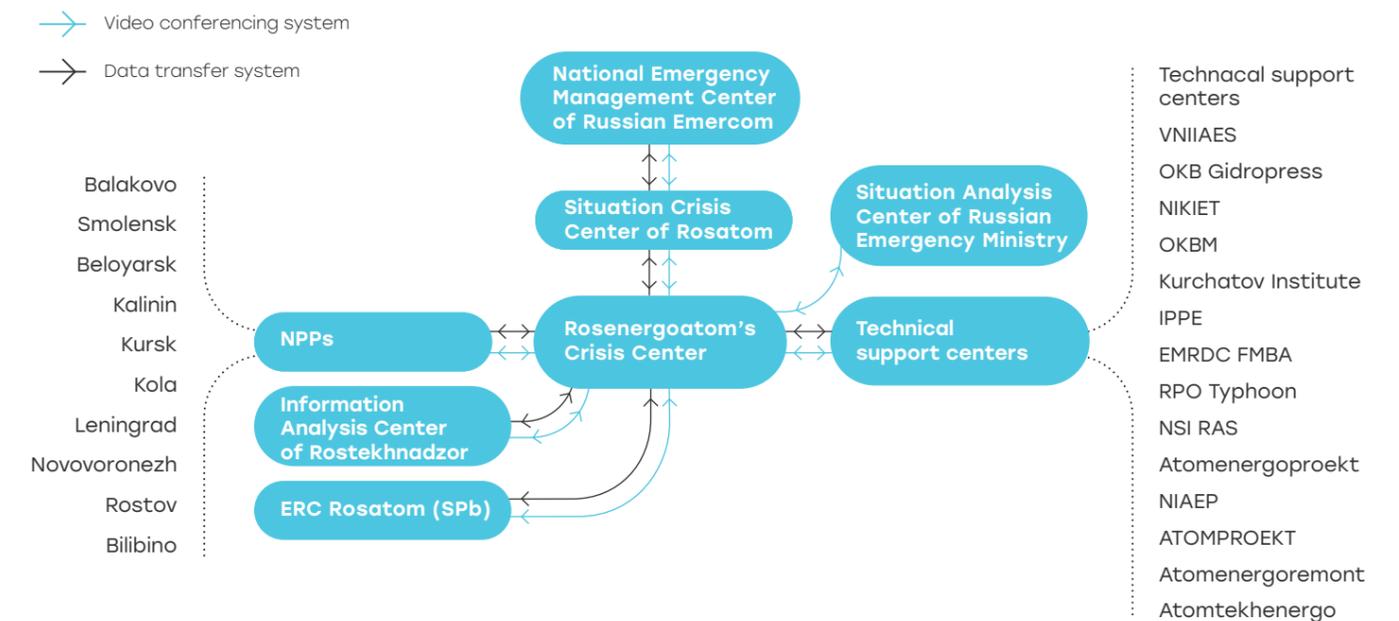
The NPP emergency response team and TSCs participated in 10 fire fighting drills and exercises at nuclear plants throughout 2018.

On the basis of the Regional Crisis Center, which had been created after the

Fukushima Daiichi NPP accident, by the WANO Moscow Center, the Company's Crisis Center and TSCs participated in international emergency exercises at foreign nuclear plants in 2018: Paks (Hungary), Mochovce (Slovakia), Loviisa (Finland), Kozloduy (Bulgaria), Metsamor (Armenia), as well as Belarus and Zaporizhia NPPs, etc.

In 2018, the Company's commissions reviewed the preparedness of the Bilibino and Novovoronezh NPPs for natural and man-made emergencies localization and elimination. Preparedness for emergencies localization and elimination was confirmed by the results of the reviews. The Company's industry-level commission attested volunteer emergency response teams at the Kalinin, Kursk, Kola and Leningrad NPPs.

Communication Coordination during Emergencies at Nuclear Plants



¹ In accordance with the Federal Law on Industrial Safety of Hazardous Production Facilities and the Federal Law on Compulsory Civil Liability Insurance of Hazardous Facility Owner against Damages Resulting from Accident at Hazardous Facility.

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3.2. Environmental Impact

The Company's environmental policy is aimed at ensuring sustainable environmentally-friendly development of the nuclear industry, and providing the level of NPP safety when the impact on the environment, personnel, and population would be minimal in the short and long terms, thus conserving natural systems, and supporting their integrity and life-sustaining functions.

Major Goals and Objectives of Environmental Policy

The Company's industrial safety and environmental protection policy ensures implementation of the basic provisions of the Russian Federation Constitution and laws, definition of main principles and obligations in the area of environmental protection, assurance of environmental safety, and sustainable environmentally-friendly development of nuclear power plants.¹

¹ The Company's Statement of Environmental Policy is available at: http://www.rosenergoatom.ru/safety_environment/vozdeystvie-na-okruzhayushchuyu-sredu/

Environmental Policy Implementation Results in 2018

NPP production activities were carried out in unconditional compliance with standards and rules of the applicable environmental laws. NPPs were operating in a safe and reliable manner, making their environmental impact as low as possible.

Key Results

₽ **4,253 mln rubles**
of environmental costs incurred
by NPPs

416 mln rubles more versus 2017

🕒 **<0.01%**

The share of NPPs in the amount of pollutant emissions into the atmosphere by all Russian enterprises did not exceed 0.01%

🕒 **0.03%**

The share effluents reached 0.03% (other Russian enterprises – around 3.5 to 4%)

In 2018:

- A positive opinion of the expert commission was received from the state environmental expert review of the materials substantiating the license for nuclear energy use – Operation of Kalinin NPP Unit No. 4 in 18-Month Fuel Cycle at 104% Level of Design Capacity;
- Revised and enacted by respective orders were: the Company's standard – Basic Rules of Ensuring Environmental Protection at Nuclear Plants; Guidelines for Annual Report on Environmental Activities of Power Plant; Instructions for Organization of Work during Production and Consumption Waste Handling;
- The actions scheduled for 2018 under the Comprehensive Plan for Implementation of Environmental Policy of Rosatom State Corporation for 2018 and Until 2018 were completed (as refers to the Company and NPPs);
- The actions scheduled for 2018 under the industry-level Prioritized Action Plan for Reduction of Negative Impacts on Environment of Rosatom State Corporation Organizations Until 2020 were taken (as refers to the Company and NPPs).

As part of the Company's industrial safety and environmental protection policy implementation, the following major operations were performed at NPPs:

Balakov NPP

- the system of oily effluents disposal from standby diesel generator units No. 1, 2 and 3 with tracing to the Crystal plant along the outer bridge was upgraded. Diesel fuel was replaced in accordance with GOST 32511-2013 at the power unit No. 1;

Beloyarsk NPP

- work was continued to introduce new sorption materials for chemical water treatment filters. The Beloyarsk reservoir biotic communities monitoring was started.
- pump units were upgraded at the integrated pump station for indus-

trial, domestic and oily effluents from the heat supply facility. Storm-water drainage treatment facility filters were upgraded..

Kalinin NPP

- a system for separate collection of solid municipal waste was implemented. Stocking of the Kalinin NPP reservoir with melioration fish was performed. Released were 67,200 young silver carps, 55,000 young wild carps and 25,000 young black carps.

Kola NPP

- aquatic biological resources were replenished (3,077 young Atlantic salmon were released into the Umba River). Procedures for production and consumption waste handling were developed and introduced: water, cardboard, LED lamps, waste electrolytic cells, glass. Wastepaper Collection Days were organized on a monthly basis;

Kursk NPP

- operations were performed for monitoring of ground and water eco-systems of the region, bio-chemical monitoring of circulating and process water supply systems. The shore area of the water sink of the NPP Stages 1-2 was cleaned up. Hydrological work was performed for monitoring of the surface waters of the NPP Stages 1-2 heat sink and the Seim River artificial bed, biological monitoring of the environment in the NPP buffer zone;

Leningrad NPP

- floating objects were removed, the bottom, the aquatic area of the feeder channel and the trashracks of the hydrotechnical structures shop were cleaned up. Commissioned were household wastewater treatment facilities in the free access area and the controlled access area, treatment facilities in the catch ditch for storm and drain waters of the industrial site;

Novovoronezh NPP

- 47.258 t of juvenile silver carps and white carps were released into the Azov Sea estuary in the Krasnodar Krai, as well as 10 t of juvenile silver carps into the power unit No. 5 heat sink;

Rostov NPP

- a procedure was introduced for collection, accumulation, transportation and sales of paper and cardboard waste generated by office and paperwork activities. 36 t of paper and cardboard were collected and sold for 130 thousand rubles. As part of commissioning of the power unit No.4, 'free-mode' treatment facilities were upgraded with a three-phase bioreactor put into operation, as well as the dephosphorization and UV treatment unit for decontamination of treated water;

Smolensk NPP

- environmentally friendly biodegradable agents were used for decontamination of equipment, rooms, overalls and personnel skin, which allowed for almost complete elimination of synthetic surface active substances discharge to the Desna River reservoir. Full-scale stocking of herbivorous fishes was performed at the reservoir.

The following awards were won in 2018:

Balakovo NPP

All-Russian environmental protection voluntary work day Green Spring 2018 – a diploma and a commemorative sign were awarded for special contribution to environment improvement and environmental enlightenment of population, active participation in the all-Russian environmental protection voluntary work day.

Russia's Environmental Leader 2018 – a diploma (among the nuclear industry enterprises)

Kalinin NPP

All-Russian contest Russia's Environmental Leader 2018 – the winner in the Best Environmentally-Responsible Nuclear Industry Enterprise nomination.

15th contest for V.I. Vernadsky National Environmental Award – Environmental Framework project (Environmental Network) – Mechanism of Supporting Environmental Stability in Kalinin NPP Location Area – the winner in the Science for Ecology nomination

Kola NPP

All-Russian contest Russia's Environmental Leader 2018 – the winner in the Best Environmentally-Responsible Nuclear Industry Enterprise nomination.

Russia's Top 100 Organizations. Ecology and Environmental Management – the contest laureate.

Smolensk NPP

Environmental Enterprise 2018 – awarded as the best in the Smolensk Oblast.

Novovoronezh NPP

Peace and Concord international project – a participation award: the First Young Environmentalist of Novovoronezh project became the winner in the Environmental Upbringing and Enlightenment nomination

In accordance with the results of the Rosatom State Corporation sponsored annual contest for Nuclear Industry Organization of Environmental Excellence, the first place was taken by the Novovoronezh NPP, the third place – by the Kalinin NPP, special nomination – the Smolensk NPP.

Main Environmental Impact Indicators

Atmospheric Emissions of Pollutants

300 mln t of CO₂
Russian NPPs annually prevent emission of some 300 mln t of CO₂

The contribution of nuclear plants into atmospheric pollution remains negligible if compared to all sectors of the national economy. The amount of atmospheric pollutants emission by nuclear power plants does not exceed the permitted values, and is considerably lower than the limits set by the environmental authorities. The bulk of pollutant emissions by NPPs are attrib-

utable to auxiliary boiler houses, health care center boiler houses and standby diesel generator stations intermittently switched on for scheduled check-ups.

The nuclear industry fully complies with the objectives of a drastic reduction in CO₂ emissions.

Gross atmospheric emissions of pollutants at all NPPs did not exceed the standard values

1,100.3 t
of pollutants emitted into the atmosphere (25.1% of the admissible level in 2018)

78.9 t
of solid pollutants

1,021.4 t
of gaseous and liquid pollutants

71.1 t
of pollutants were received of gas cleaning and dust capturing units (out of them: 71.9 t were captured and decontaminated (catching efficiency – 97%))

Volume of Pollutant Emissions into Atmosphere by Nuclear Power Plants in 2016-2018, T

Emissions of NO_x, SO_x, and Other Significant Pollutants into Atmosphere, Indicating their Type and Mass, T

Indicator	2016	2017	2018
Sulfur dioxide	463.5	480.8	495.2
Carbon oxides	146.1	114.1	111.0
Nitrogen oxides (in NO ₂ equivalent)	213.6	186.2	181.5
Hydrocarbons (excl. volatile organic compounds)	164.0 (methane)	154.7 (methane)	147.3 (methane)
Volatile organic compounds	70.1	71.9	64.3
Other gaseous and liquid	24.1	23.0	22.1
Total	1,081.4	1,030.7	1,021.4

Emissions of Ozone-Destroying Substances (ODS) in 2016-2018, T

Name of ODS	ODS Emitted, T		
	2016	2017	2018
HCFC-22	10.729	11.107	8.082
Total, including ODP	$10.729 \times 0.055 = 0.590$	$11.107 \times 0.055 = 0.611$	$8.082 \times 0.055 = 0.445$
HCFC-141b	1.745	1.550	1.630
Total, including ODP	$1.745 \times 0.11 = 0.192$	$1.550 \times 0.11 = 0.171$	$1.630 \times 0.11 = 0.179$
HCFC-142b	0.015	2.853	0.290
Total, including ODP	$0.015 \times 0.065 = 0.001$	$2.853 \times 0.065 = 0.185$	$0.290 \times 0.065 = 0.019$

HCFC-22 - difluorochloromethane (ODP = 0.055);
HCFC-141b - 1,1-dichloro-1-fluoroethane (ODP = 0.11);
HCFC-142b - 1-chloro-1,1-difluoroethane (ODP = 0.065).

In order to further decrease the load on the atmosphere, the technology was streamlined to improve the fuel burn-out efficiency ratio, the better quality fuel

oil was used; the paintwork technology was improved; efficient gas treatment and dust arresting facilities were commissioned.

303-1

Pollutants Discharge to Water Bodies

Nuclear plants are large water consumers, therefore the issues of water consumption and water removal are important aspects of the environmental activities. Almost all water withdrawn from water bodies (over 99%) at NPPs was used for production

needs (cooling of process media in turbine condensers and heat exchange equipment) and returned to water bodies.

Water Use by Sources, mln m³

Withdrawn Water by Sources	2016	2017	2018
Potable water from natural water sources	11.5 (among them 8.0 – ground water)	11.1 (among them 7.5 – ground water)	12.5 (among them 8.0 – ground water)
Potable water from water supply utility systems and other water supply systems	6.8	5.9	5.7
Fresh process water from natural bodies of water	1,665.6	1,679.0	1,702.5
Sea water	5,234.4	4,969.7	4,891.8
Total	6,918.3	6,665.7	6,612.5



NPPs do not make a considerable impact on water sources. The water sources used by nuclear power plants do not belong to protected areas. Nuclear power plants have no effect on the wetlands included in the Ramsar List.

In 2018, NPP wastewater disposal was within the limits of water balance and the amount of generated power, and totaled 93.4% of the volume of water used. It is a good indicator of water resources use. Water resources were used in compliance with the limits

established by environmental authorities.

Waste waters of household sewage and storm water drainage were treated before their discharge into surface waters at all NPPs. Control of the content of pollutants entering surface water with waste waters from NPPs was effected in accordance with duly agreed and approved rules.

303-3

Total Volume of Multiusable and Reusable Water, mln m³

Water Consumption	2016	2017	2018
In water recycling systems	32,469.1	32,618.3	33,334.7
In reused water systems	474.1	456.7	446.1

303-2

Sea / potable water withdrawal and discharge

306-5

NPP	Water Bodies	Withdrawal	Discharge
Balakovo	Saratov Reservoir	↑	↓
Beloyarsk	Beloyarsk Reservoir	↑	↓
	Olkhovskoye Swamp		↓
Bilibino	Reservoir on Bolshoi Ponneurgen Stream	↑	
	Bolshoi Ponneurgen Stream		↓
Kalinin	Kalinin NPP Reservoir (heat sinks)	↑	↓
	Volchina River, Khomutovka River		↓
Kola	Glubokaya Bay of the Imandra Reservoir	↑	
	Molochnaya Bay of the Imandra Reservoir		↓
Kursk	Seym River	↑	↓
Leningrad	Koporye Bay in the Gulf of Finland, Sista River, Kovashi River	↑	↓
	Kopanskoye Lake	↑	
	Peipia River		↓
Novovoronezh	Don River	↑	↓
Rostov	Tsimlyansk Reservoir	↑	↓
	Heat sink of the Tsimlyansk Reservoir		↓
Smolensk	Reservoir on Desna River	↑	↓



6,178.5 mln m³ of waste water were removed in total in 2018

All water reservoirs used for process and recycling water supply to nuclear power plants (except for the Leningrad and Bilibino NPPs) are included into the List of Water Reservoirs (including Water Reservoirs with Capacity Exceeding 10 mln m³) subject to development of the rules of use for each water reservoir.¹

306-1

In 2018, 6,178.5 mln m³ of waste water were removed in total (↓76.5 mln m³ versus 2017), and the share of polluted waste water was 0.03%.

6,168.7 mln m³ of partially clean waste water and 7.5 mln m³ of waste water treated to standard quality were

discharged into water bodies in 2018, including:

- 5.4 mln m³ at the mechanical water treatment facilities;
- 2.1 mln m³ at the biological water treatment facilities.

303-3

The discharge volumes of polluted waste waters are steadily reduced thanks to consistent modernization and reconstruction of waste water treatment facilities at NPPs.

¹ Approved by the Russian Federation Government Directive No. 197-r dated February 14, 2009.

Handling Production and Consumption Waste

As far as handling production and consumption waste (hereinafter – waste) is concerned, NPPs effect their environmental protection activities in accordance with legislation of the Russian Federation in the area of environmental protection, and based on the license and approved draft standards for waste generation and limits on waste emplacement.

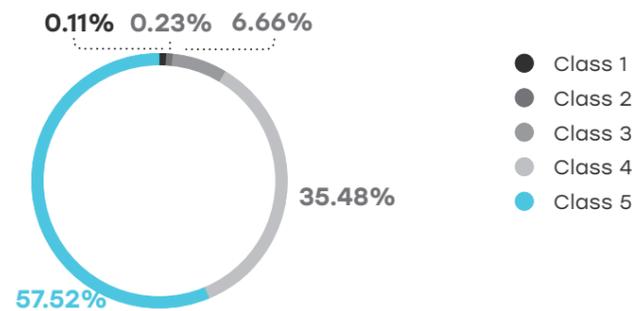
306-2

Nuclear power plants generate waste of five hazard classes, resulting from their production activities. In 2018, NPPs generated 35,077 t of waste (↓35 t versus 2017).

Production and Consumption Waste by Classes, T

Indicators	2016	2017	2018
Class 1	53	39	39
Class 2	68	39	81
Class 3	2,296	3,045	2,334
Class 4	14,931	14,754	12,447
Class 5	19,555	17,234	20,176

Distribution of Waste Generated in 2018 by Hazard Classes



Waste Management in 2018, T



* including waste located at own facilities for storage

In 2018, 703 t of waste was transferred by NPPs to other organizations for treatment, 2,044 t for decontamination, 11,164 t for burial.

Waste is sourced from auxiliary structural units and units supporting nuclear power plants operation (maintenance and repair of buildings, equipment, NPP personnel servicing, waste water treatment, metal and wood processing).

All production and consumption waste is emplaced at specially equipped sites, in special storages, and their disposal is controlled by NPP ecological services.

Environmental Costs

The environmental costs incurred by NPPs include expenses for protection and rational use of water resources (including payments to other enterprises for acceptance and treatment of waste waters), atmospheric air, environmental protection against the adverse impact

of production and consumption waste (including payments under contracts on transfer of waste to specialized organizations).

₹ 4,253 mln rubles
environmental costs
incurred by NPPs in 2018

The environmental costs incurred by NPPs totaled 4,253 mln rubles in 2018. (↑ 416 mln rubles versus 2017), including:

Environmental Costs, Mln Rubles

2016	2017	2018
3,447	3,837	4,253

A fine in the amount of 20.0 thousand rubles was imposed on the Leningrad NPP in 2018 for violation of the environmental regulations.

- Atmospheric emissions of pollutants;
- Discharge of pollutants into waters;
- Production and consumption waste emplacement.

307-1

Nuclear power plants are obliged to pay for the following types of adverse impact on the environment:

Environmental Impact Fee, Thousand Rubles

Item	2016	2017	2018
Fee for allowable and excessive emission (discharge) of pollutants (emplacement of production and consumption waste)	10,315	6,748	8,680
Funds (charges) and fines recovered in compensation for damage caused by breach of environmental legislation	60	30	20

Environments costs

Item	Current (Operating) Environmental Costs	Payments for Environmental Services
Protection of atmospheric air and prevention of climate change	148	140
Collection and treatment of waste waters	1,036	131
Waste handling	428	75
Protection and rehabilitation of lands, surface and ground waters	126	73
Protection of environment against noise, vibration, and other types of physical impact	1	2
Preservation of biodiversity and protection of natural areas	23	10
Ensuring environmental radiation safety	1,423	420
Research activities aimed at reducing adverse human-induced impact on environment	1	0
Other areas of environmental protection activities	167	49

More about environmental risks management, environmental audit and environmental management systems certification see the online version of the Report.

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416-1

3.3. Radiation Effect on Personnel and Population

Maintenance of the highest possible radiation safety level for the personnel of NPPs and the population in their location areas, and prevention of any radioactive contamination of the environment are the prioritized objectives of the Company.

The Company strictly abides by sanitary rules, radiation safety standards and rules with constant monitoring of the radiation situation at NPPs and in adjacent areas, personnel doses, radioactive substances emission and discharge values; consistently conducts the policy of implementation and further development of the methodology on radiation protection optimization at nuclear power plants, which consists in maintaining individual exposure doses and number of exposed persons on the lowest possible levels taking into account the economic and social factors.

The Company maintains a trend of decreasing the personnel exposure as a result of its activities aimed at improving the radiation situation at the process equipment and in process rooms, reducing the personnel exposure to ionizing radiation fields, as well as the measures aimed at streamlining of the radiation protection at nuclear plants.

416-2

Results of 2018 in Radiation Safety Maintenance

The basic exposure dose limits among personnel at all NPPs **were not exceeded**

<90% of NPP personnel were not exposed above the individual dose limit of 5mSv set for the population

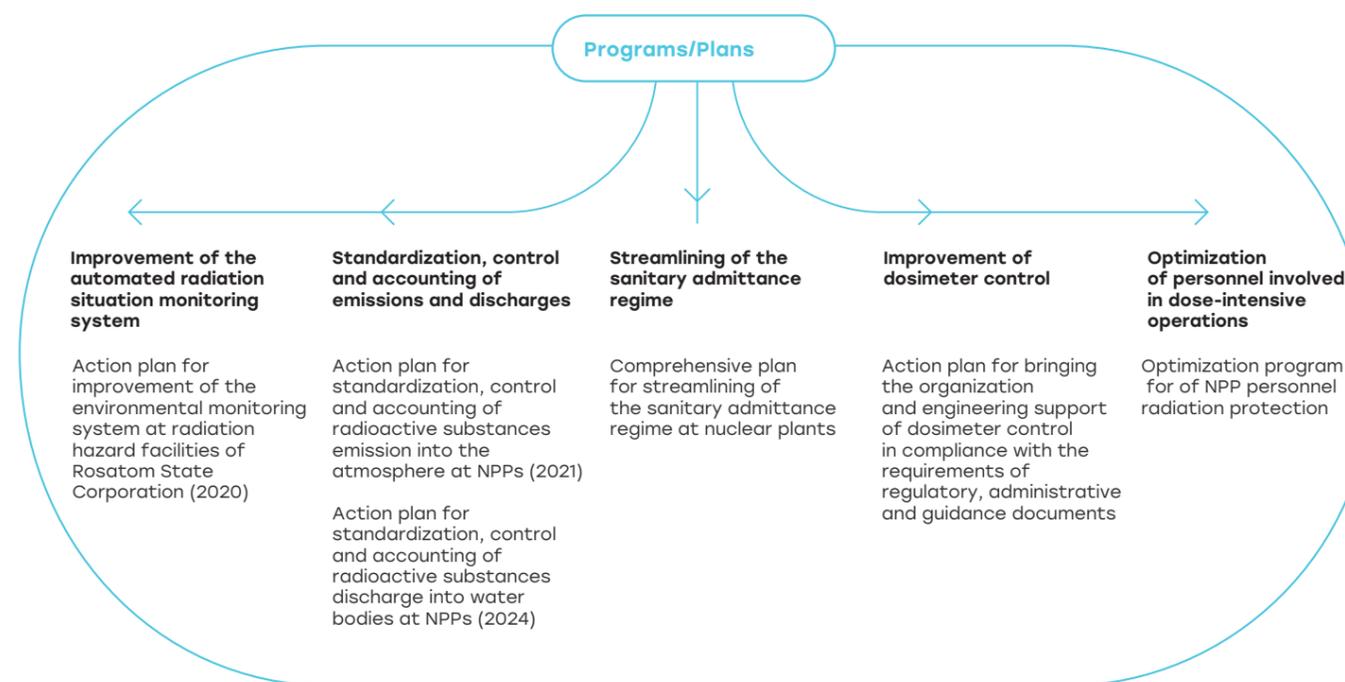
Unauthorized exceeding of the reference level of the individual exposure dose (18 mSv) **was eliminated**

No unauthorized discharge of radioactive nuclides into the environment took place

Ongoing expenses for ensuring environmental radiation safety totaled **1,423 mln rubles**

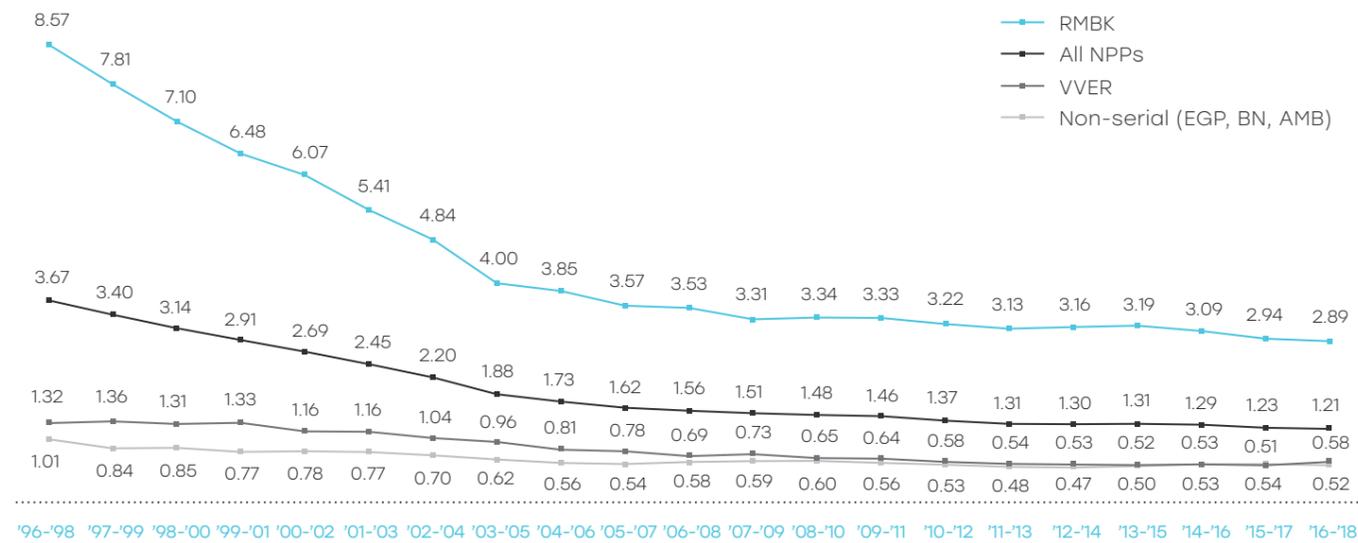
Gas-aerosol emissions by NPPs and radioactive substances discharge into water bodies were considerably **lower than applicable standards**

Programs/Plans of Radiation Protection Measures for Personnel



403-3

Sliding (over Three Years) Collective Doses at NPPs by Types of Reactor Units (Person-Sv/Unit)

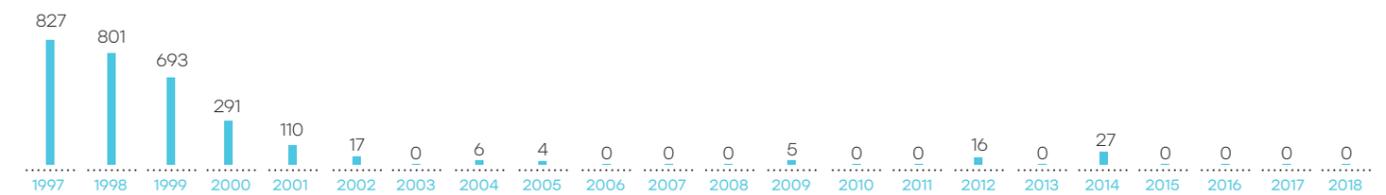


During the recent 10 years, the dose intensity has been at a consistently low level. Collective doses decreased by 3 times between 1996 and 2018.

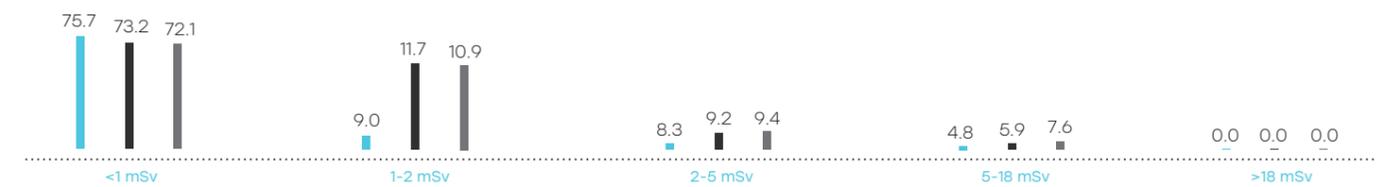
Current radiation exposure of personnel at nuclear power plants with VVER and BN type reactors almost reached the optimal level comparable to similar indicators of foreign NPPs, slight deviations from which are usually defined by the number and duration of repairs during the year.

The maximum individual exposure dose among NPP personnel does not exceed the target indicators set for nuclear plants.

Number of Employees with Individual Doses Exceeding Reference Level



Personnel Breakdown by Dose Intervals, %



90% of personnel do not exceed 0.1 of the dose limit (50 mSv a year).

0.06–0.20 μSv/h
Gamma-radiation intensity varies between 0.06 and 0.20 μSv/h.

Radiation environment in the areas of NPPs features the natural background level, which is typical for Russia.

Radiation Control

The Company manages dose loads and radiation risks with the use of the automated system of individual dosimeter control (ASIDC) and the automated workstation calculating individual radiation risk (AWCIR).

Work was performed to streamline the procedural guidelines for the personnel exposure doses control in 2018. The new Procedural Guidelines for Evaluation of Personnel Skin Dose during Local Contamination with Radioactive Substances, and the Procedure for

Operational Control of Thyroid Dose Equivalent were developed.

The documents related to external doses control were updated:

- Typical Program for Dosimeter Control of External Exposure Control at Nuclear Plants;
- Guidelines for External Exposure Doses Measurement for NPP Personnel (Typical).

In 2018, work was accomplished to compile new standards of maximum permissible emissions and discharges of radioactive substances by NPPs into the environment in accordance with Rostekhnadzor guidelines. Nuclear plants received new permits by Rostekhnadzor for emissions and discharges of radioactive substances into the environment. Constant control

of compliance with standards is performed by radiation safety departments of NPPs.

There was no unauthorized discharge of radioactive nuclides into the environment in 2018. As in the previous years, in 2018, environmental discharges and emissions of radioactive substances by NPPs did not exceed Rostekhnadzor standards for maximum permissible emission of radioactive substances into the air and for permissible discharge of radioactive substances into water bodies.

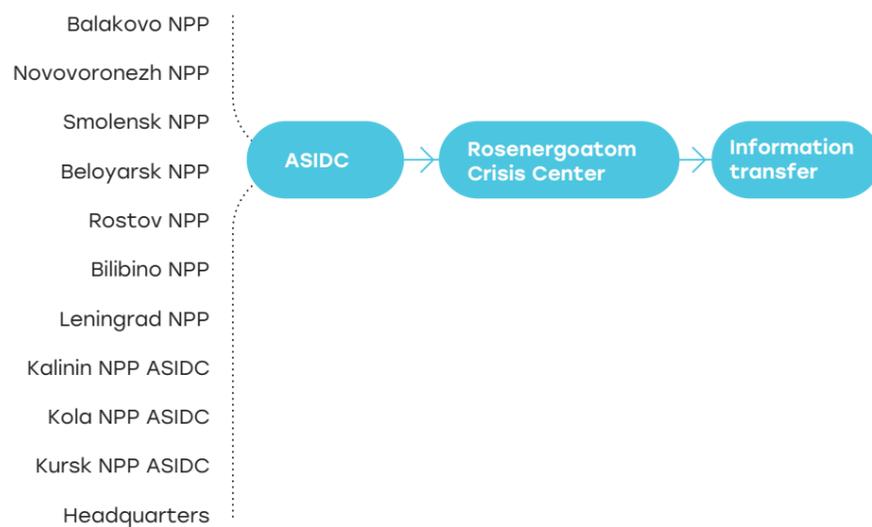


The doses of population exposure due to gas-aerosol emissions by NPPs did not exceed the minimum significant level of 10 µSv a year. The population exposure to discharge of radioactive substances into water bodies did not exceed the quota for population exposure to discharge (50 µSv a year) set for NPPs by the Sanitary Rules for Designing and Operation of Nuclear Plants (SP AS-03).

Constant radiation control at NPPs, including the safety barriers integrity control, is ensured through the use of the NPP radiation control system (RCS).

The ASIDC keeps record of an employee's individual dose: during 1 year; during 5 years; during the whole period of labor activity.

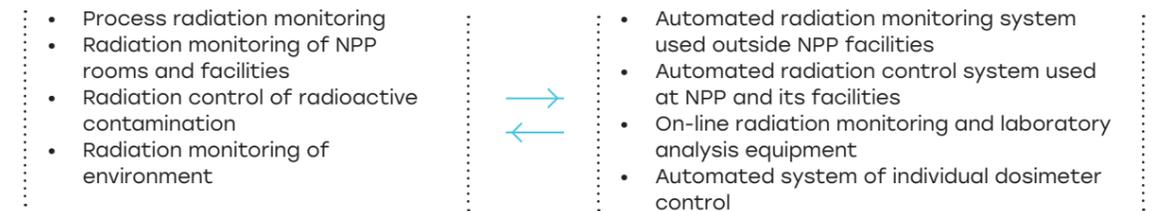
Automated system of individual dosimeter control ASIDC



Information about personnel exposure at NPPs and contractors that was shaped on the basis of NPP ASIDC data is transferred in the electronic format established by Russian FMBA to:

- the Unified State System for Control and Accounting of Personnel and Population Exposure Doses;
- the territorial bodies of state sanitary and epidemiological supervision (on an annual basis);
- Rosatom in the amount and procedure defined by Form 10 RTB-5 (Information on Radiation and Toxic Safety Status of Organization) for industry-level statistical survey.

Radiation control system



The maximum emissions and discharges of radioactive substances into the environment do not exceed the specified standards.

In 2018, work was performed for the upgrade of emissions and discharges control sub-systems of the RCS with a view to ensure radiation control of standardized radionuclides in emissions and discharges.

NPP radiation control organization (scope, frequency, control points, performers, and result record-keeping) is determined by relevant rules approved by regional directorate of the Federal Medico-Biological Agency (FMBA) of Russia. In addition, regional directorates of FMBA of Russia perform independent selective radiation control of environmental facilities and foodstuff produced locally.

Regular measurement of radioactive substances concentration in the atmosphere and heat sinks,

activity measurement of soil, plants and foodstuff at the control points located at a distance of 50 km from NPPs confirm the absence of a detectable impact of NPPs operation on the condition of objects of outside environment.

- Satisfactory radiation safety situation at NPPs;
- Minimal impact of operational NPPs on the radiation situation in the controlled access areas and radiation control areas;
- Zero level values of radionuclides content and specific activity in the environment, and gamma radiation intensity in the controlled access areas and radiation control areas;
- Unconditionally acceptable radiation risk for the population living in the areas of NPPs.

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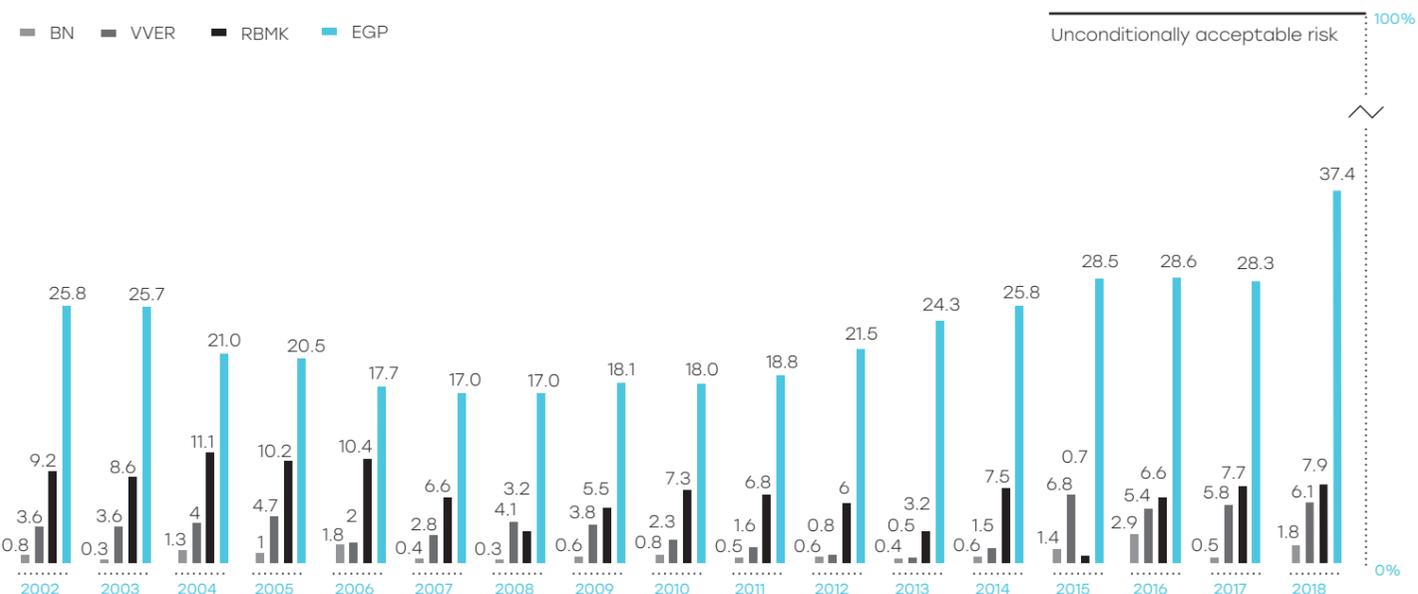
The population exposure doses in the areas of NPPs are considerably lower than the admissible values.

Emissions of Iodine-131 into Atmosphere in 2018

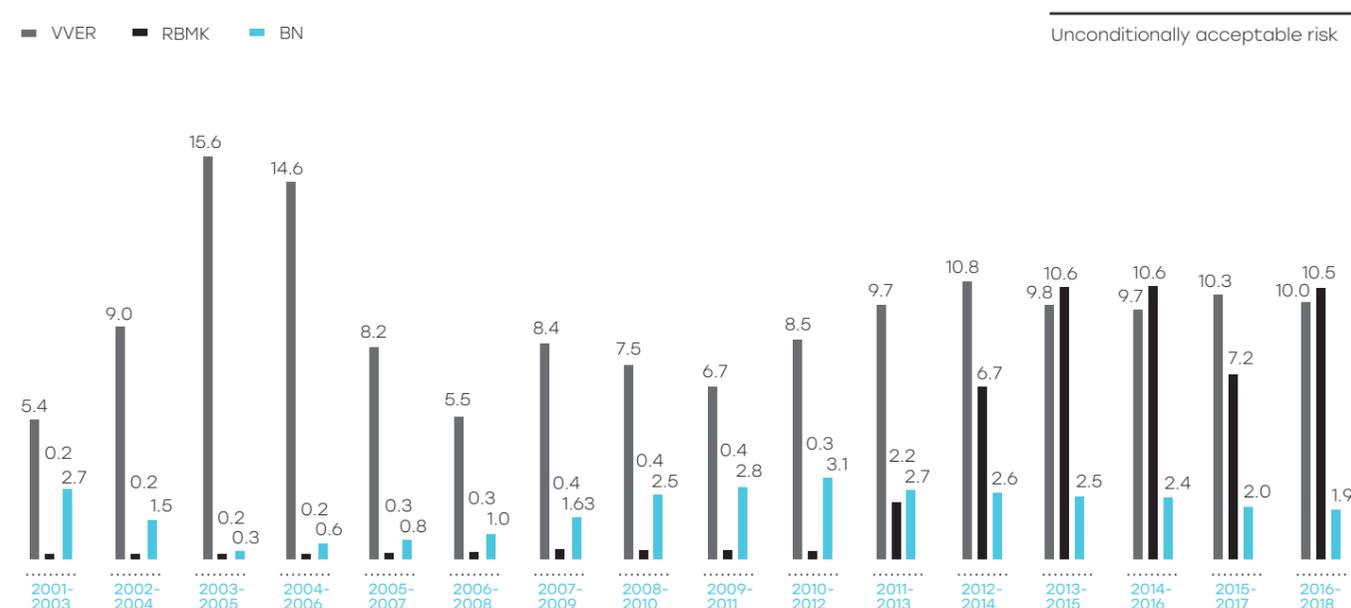
NPP	MBq	% of Allowable Emissions
Balakovo	70.7	0.39
Beloyarsk	6.6 ¹	0.04
Bilibino	162.2	0.9
Kalinin	220.1	1.22
Kola	73.0	0.41
Kursk	1,105.5	1.19
Leningrad	519.9	0.89
Novovoronezh	36.1	0.2
Rostov	80.8	0.45
Smolensk	99.9	0.006

¹ Actual discharge of radioactive iodine was not registered during the year. The calculated value equal to the product of 0.5 of the lower measurement limit times the aggregate emission amount.

Inert Radioactive Gas Emissions (% of Permissible Value)



Radionuclides Discharge into Surface Water (% of Permissible Value)



Nonproliferation of Nuclear Materials¹

For the entire period of NPPs operation, there were no losses, theft, or unauthorized use of nuclear materials.

Nonproliferation of nuclear materials is ensured through the Company's system of state accounting and control of nuclear materials. This system functions in full compliance with the requirements of international and Russian regulations and is under control of Rosatom State Corporation and Rostekhnadzor. The system comprises a set of organizational activities, regulatory and procedural documents, and technical

means which provide for accounting and control, and prevention of unauthorized operations with nuclear fuel at all stages of its handling at NPPs.

Physical inventory count of nuclear materials takes place in order to comply with the procedure for accounting and control of nuclear fuel at the places of storage and use of fuel assemblies.

Results of 2018: safety was ensured during SNF and RAW management.

Handling Radioactive Waste and Spent Nuclear Fuel

Rosenergoatom creates new and upgrades the existing RAW processing plants, storage facilities construction at NPP sites ensuring environmental protection throughout their life cycles, and during decommissioning. All operations related to RAW are carried out in compliance with the applicable federal laws.

SNF volumes removed from NPP sites correspond to the level planned for 2018.

- 11 trains of SNF from the AMB reactors of the Beloyarsk NPP were removed to PO Mayak in 2018 (in 2017 – 2).
- A container storage and handling complex was put into pilot commercial operation at the Smolensk NPP. Two UKKh-109 containers were filled with dismantled SFAs in 2018.

RAW handling:

- In 2018, NPPs produced 6,248.1 m³ of solid RAW, including:
 - Very low activity level – 5,158.1 m³,
 - Low activity level – 642.7 m³,
 - Cold radioactive – 400.7 m³,
 - High activity level – 46.6 m³,
 - And liquid RAW – 2,876.2 m³.
- Transfer of federal RAW² was organized for further burial from the Balakovo NPP – 2,016 m³ and the Kursk NPP – 1,846 m³,
- Reprocessing of federal liquid RAW was performed at the Kola and Novovoronezh NPPs in the amount of 1,965 m³, solid RAW at the Kola, Kursk, Leningrad, Novovoronezh, Smolensk NPPs in the amount of 2,445 m³.

Construction of RAW and SNF handling facilities continued in 2018:

NPP	RAW Handling Facilities Construction	SNF Handling Facilities Construction
Balakovo	+	
Kursk	+	+
Leningrad	+	+
Smolensk	+	+

¹ The system for nonproliferation of nuclear materials is described in detail in 2014 Rosenergoatom Annual Report (Pages 74-75).

² As a part of the execution of the Federal Special Purpose Program for Nuclear and Radiation Safety in 2016-2020 and until 2030

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103-3

3.4. Labor Protection

403-4

₽ 3.5 bln rubles
labor protection
expenses in 2018

The Company's labor protection policy is aimed at:

- Prioritizing the employees' life and health protection during their labor activities;
- Implementing consistent and uninterrupted measures for prevention of incidents, workplace injuries and occupational diseases, including vocational risks management;
- Developing the social partnership medium in ensuring the employees safety;
- Planning, funding and arranging the measures aimed at the decrease in the number of workplace injuries and occupational diseases.

The Company runs the labor protection management system based on a risk-oriented approach in order to implement the Policy. Hazards are identified and risks are evaluated for every workplace, evaluated risks management by means of approval of corrective actions depending on the risk level (differentiated approach to defining corrective actions and their implementation timeframes). In line with the schedule, labor conditions are assessed in a specific way laying the basis for a single complex of consistent measures for identification of adverse and (or) hazardous factors of the production medium and labor process, and evaluation of their impact on an employee.

The matters of safety and health are included in the Industry-Wide Agreement on Nuclear Power, Industry and Science for 2018-2020 made between the employees and employers with participation of Rosatom State Corporation.

The nuclear plant labor protection department organizes and coordinates interaction with contractors in compliance with typical provisions¹. Among the objectives of the labor protection department are briefing and consultation of managers and employees of NPP structural units in labor safety, and studying and distribution of the best labor protection practices:

- Regular briefing of NPP managers on the labor protection status, and shaping of proposals for streamlining of the labor protection system at the NPP.
- Provision of guidelines to heads of structural units for compilation of the lists of jobs and positions of the employees subject to mandatory preliminary and periodic medical examinations, and the lists of jobs and positions entitled to compensation in accordance with the Russian Federation laws.
- Provision of guidelines to heads of structural units in development and revision of labor protection instructions.
- Making the employees aware of laws and other regulations on labor protection in the Russian Federation and a respective Russian entity, the Collective Agreement sections related to labor protection.
- Organization and management of the labor protection office, provision of guidelines to structural units in creation of information stands, labor protection corners.

403-1 Activities of Labor Protection Committees

403-1

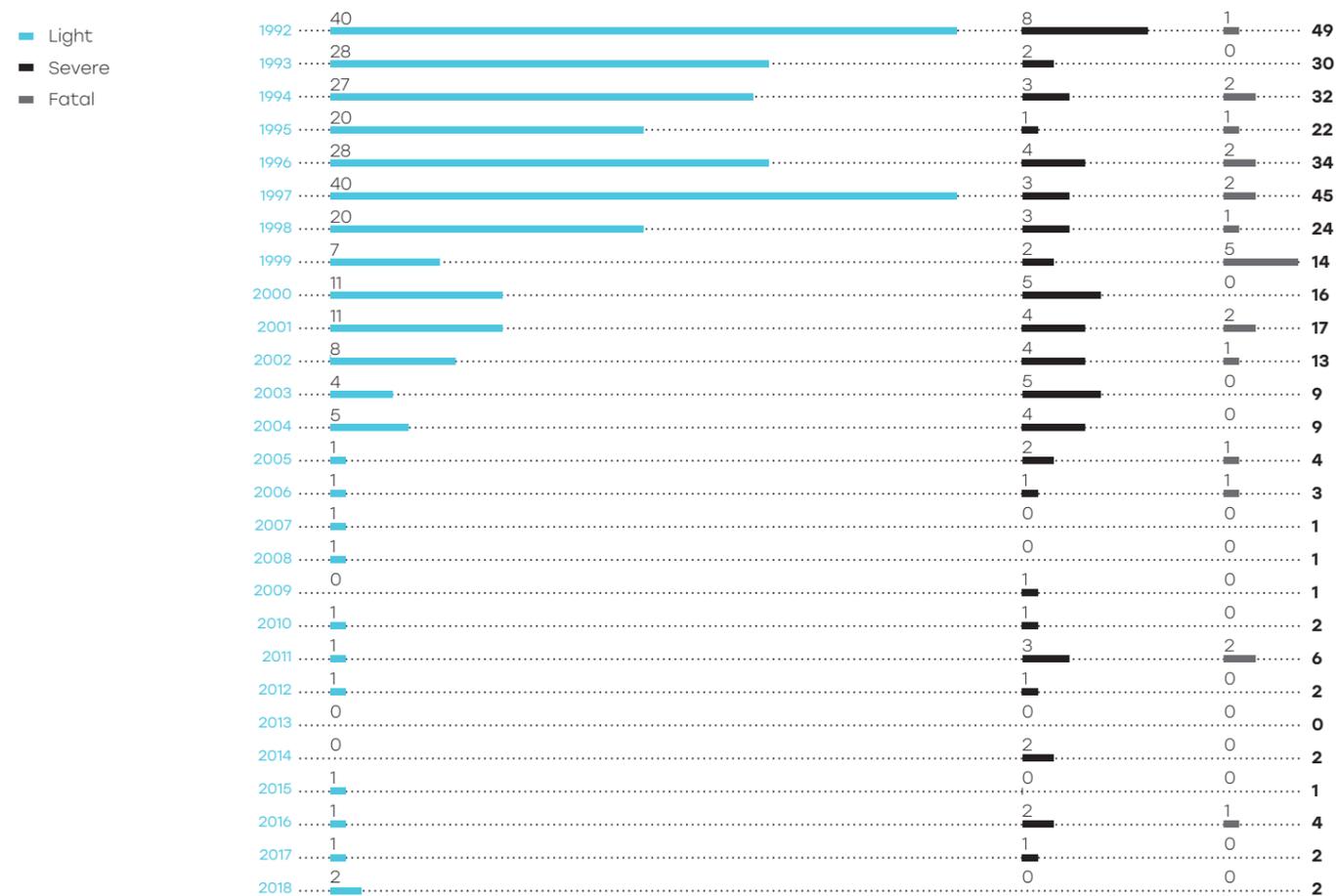
Labor protection committees (commissions)² were created at each of the Company's NPPs in line with the Standard Regulation on Labor Protection Committee (Commission), taking into account the trade union's opinion. Committees are an integral part of the labor protection management system, as well as one of the forms of employees' participation in labor protection management. The committees' work hinges on the principles of social partnership, and their activities involve all NPP employees. The committees act in accordance with the procedures and action plans developed by them and approved by the committee chairman. The committees report on the work performed at least once a year to the elected body of the primary trade union organization or the meeting (conference) of employees (as soon as the employees' requests are received).

Employees Injury Rates

Two incidents occurred with the Company's employees at the operational NPPs (both light, at the Kola and Smolensk NPPs) in 2018. There were no incidents among NPP personnel at the NPP units under construction in 2018.

Changes in Number of Injuries at Operating NPPs in 1992–2018³

403-2



² Model Regulation on Labor Protection Committee (Commission) was approved by the Order of the Russian Ministry of Labor No. 412n dated June 24, 2014. The Order was registered by the Russian Ministry of Justice No. 33294 on July 28, 2014 and entered into effect on August 29, 2014.
³ One incident occurred with a woman in 2018.

¹ TPO 1.1.8.03.1146-2016 – Organization of Interaction of Nuclear Plant in Labor Safety Issues with Contracting Organizations Working with Equipment and at Premises of Operational Nuclear Plant. Model Regulation, TP 1.2.6.1.0175-2015 – Labor Protection Management System at Nuclear Plants Construction Sites. Model Regulation.

Injury Rate among Contractors' Employees

Number of incidents on operating NPPs in 2016-2018

NPP	2016	2017	2018
Balakovo	–	–	–
Beloyarsk	–	–	–
Kalinin	–	–	–
Kola	3 (1 + 1 + 1)	–	–
Kursk	–	2 (1 + 1)	1
Leningrad	–	–	–
Rostov	–	–	–
Smolensk	–	–	1
Total	3 (1 s., 1 gr., 1 l.)	2 (1 s., 1 l.)	2 (2 l.)

■ – fatal ■ – severe ■ – group ■ – light



0.03 LTIFR

Lost Time Injury Frequency Rate (LTIFR) in Rosenergoatom averaged 0.03 in 2018 (0.05 in 2017), with the KPI limit of 0.15.

The incidents were caused by personal negligence of the injured persons that resulted in falling off their feet.

Statistics of Injury Rate among Contractors' Personnel

NPP	2016	2017	2018
At the Company's operational NPPs			
Balakovo	–	1	–
Beloyarsk	1	–	–
Kalinin	–	–	1
Kola	1	–	–
Kursk	–	1	1
Leningrad	–	1 (1 + 1)	–
Rostov	1	–	1 (3) and 1
Smolensk	1	–	1
Total	4	3	5
At construction facilities of the Company's NPPs under onstruction			
Kursk NPP-2	1	–	1
Leningrad NPP-2	–	1 (1 + 1)	–
Novovoronezh NPP-2	–	–	–
Rostov, power units No. 3 and 4	2 (1 + 1)	–	–
Total	3	1	1
Total	7 (2 f., 2 s., 3 l.)	4 (2 gr., 1 f., 1 l.)	6 (1 gr., 2 f., 1 s., 2 l.)

■ – fatal ■ – severe ■ – group ■ – light

Causes of incidents:

- Weak points of the work execution plan (WEP);
- Unsatisfactory organization of work execution;
- Wrong procedure of the process operations stipulated by the WEP;
- Insufficient supervision by the officials responsible for construction operations organization and arrangement over construction and assembly operations arrangement, and over compliance with process procedures of construction and assembly operations execution.

In order to prevent injuries and eliminate the causes of occurred incidents, certain corrective measures have been developed and are implemented:

- Following the analysis of the current system of Rosenergoatom interaction with contractors;
- For prevention of injuries at NPPs in the following areas: Organizing personnel access to rooms and hardware storage, organizing personnel relations;
- Improving organization of work with high-voltage equipment of the NPP open distribution systems;

- Streamlining the organization of work with electric plants and at heights following the results of process audits of the electric plants safety status, inspection audits of duties performance by the officials in charge for ensuring safety when working with electric plants and of labor protection requirements observation when working at heights.

403-2

Injury Rates¹ at All Organizations of Power Engineering Division

0.02 – rate of fatal workplace injuries

0.04 – rate of severe injuries (deaths excluded)

0.08 – rate of registered workplace injuries.

No occupational diseases were detected in 2018 among the employees of Rosenergoatom and its contractors.

Injury Rates

	Injury rate in the workplace	Occupational diseases rate	Lost day rate	Absence rate at the workplace
Rosenergoatom Headquarters	0	0	0	0.03
Balakovo NPP	0	0	0	0.04
Beloyarsk NPP	0	0	0	0.06
Bilibino NPP	0	0	0	0.07
Kalinin NPP	0	0	0	0.06
Kola NPP	0.30	0	104.15	0.04
Kursk NPP	0	0	0	0.04
Leningrad NPP	0	0	0	0.05
Novovoronezh NPP	0	0	0	0.04
Rostov NPP	0	0	0	0.03
Smolensk NPP	0.16	0	0.33	0.07
Voronezh AST	0	0	0	0.03
Directorate of Kostroma NPP under construction	0	0	0	0.10
Directorate for Construction and Operation of Floating Nuclear Power Plant	0	0	0	0.02
Directorate of Baltic NPP under construction	0	0	0	0.03

¹ Injury, lost day and absentee rates were calculated on the basis of GRI guidelines. When defining the lost day rate resulting from workplace injuries, calculations are made on the basis of calendar days, starting from the employee's absence Day 1. The lost day rate and the occupational injury rate are calculated with the use of 1,000,000 ratio. The absentee rate and the lost day rate are calculated through dividing by the actual hours worked.

Main Results of Labor Protection in 2018

- Introduction of the Occupational Health and Safety process as a part of the IMS – regulation, joint work of the NPP task force, indicators monitoring.
- Sustainable application of the Labor Safety Management System procedures in order to manage

high/medium risks, and the Standard Regulation on LSMS at the construction site.

- Occupational health and safety checks were performed at NPPs according to the safety inspection schedule for 2018.

Labor Protection Expenses in 2018

NPP	Amount, Mln Rubles	Expense Items
Balakovo	317.835	<ul style="list-style-type: none"> • Labor protection activities according to collective agreements; • Ensuring normal working environment; • Improving labor conditions and protection; • Acquiring personal protective equipment; • Therapeutic and preventive nutrition; • Purchasing detergents and disinfectants.
Beloyarsk	297.188	
Bilibino	124.490	
Kalinin	429.404	
Kola	363.834	
Kursk	370.235	
Leningrad	574.574	
Novovoronezh	384.644	
Rostov	303.568	
Smolensk	373.246	
Total	3,539.02	

04



Sustainability Management

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The first stage of launching the pilot project “Smart home” completed by AtomEnergSbyt in four regions. In Kursk, Smolensk, Tver and Murmansk regions were selected multi-unit apartment buildings where installed not just smart metering devices and elements of the intellectual resource management system.

4.1. Sustainable Development Goals

Being one of the largest power industry enterprises and the only operator of Russian nuclear plants. The Company significantly influences the socioeconomic welfare of the society and the environment in the areas of presence – locations of nuclear plants and regions of business activities, as well as on the global scale.

The matters related to sustainability management are regularly put on meetings agenda of the Company's Board of Directors, and its directorate.

102-20

Delineation of functional responsibility areas of sustainable development among core structural units is given below:



The Company fully understands its economic, social and environmental responsibility before the society and completely supports the UN Sustainable Development Goals¹ (UN SDGs) that can be achieved through combination of efforts of governments, private sector, civil society, and the global community.

102-15

Rosenergoatom Contribution to Achievement of UN SDGs

UN SDG	Report Sections Related to Rosenergoatom Contribution to Achievement of UN SDGs
	3.1. Ensuring Safety of Russian NPPs 3.2. Environmental Impact 3.3. Radiation Effect on Personnel and Population 3.4. Labor Protection 4.3. Investment Program Implementation 4.5. Developing Social Capital and Areas of Presence. Charity
	4.3. Investment Program Implementation 4.4. Developing Human Capital. Knowledge Preservation and Transfer 4.5. Developing Social Capital and Areas of Presence. Charity
	2.1. Generating Capacities. Developing Generating Potential 3.2. Environmental Impact
	2.1. Generating Capacities. Developing Generating Potential 3.1. Ensuring Safety of Russian NPPs 3.2. Environmental Impact 2.5. International Business and New Products
	2.2. Sci-Tech Policy. Innovations 2.3. Digitalization Program 2.4. International Sci-Tech Cooperation 4.2. Ensuring Financial Stability
	4.5. Developing Social Capital and Areas of Presence. Charity

UN SDG	Report Sections Related to Rosenergoatom Contribution to Achievement of UN SDGs
	2.1. Generating Capacities. Developing Generating Potential 2.2. Sci-Tech Policy. Innovations 2.3. Digitalization Program 2.4. International Sci-Tech Cooperation 2.5. International Business and New Products
	2.1. Generating Capacities. Developing Generating Potential 3.1. Ensuring Safety of Russian NPPs 3.2. Environmental Impact
	2.1. Generating Capacities. Developing Generating Potential 3.2. Environmental Impact 2.5. International Business and New Products
	2.1. Generating Capacities. Developing Generating Potential 3.2. Environmental Impact
	4.3. Investment Program Implementation 4.5. Developing Social Capital and Areas of Presence. Charity 5.4. Combating Corruption
	2.4. International Sci-Tech Cooperation 2.5. International Business and New Products 4.3. Investment Program Implementation 4.5. Developing Social Capital and Areas of Presence. Charity

¹ On September 25, 2015, the UN member states adopted the 2030 Agenda for Sustainable Development. It contains 17 goals aimed at liquidating poverty, preserving the planet resources and ensuring well-being for all. Each of the goals contains a series of indicators that shall be achieved during 15 years

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	201-1

4.2. Ensuring Financial Stability

The Company's financial and economic policy is aimed at ensuring the efficiency and high performance of Rosenergoatom in the long term, creating a reliable financial platform for future development.

Key Financial and Economic Indicators of Rosenergoatom Activities

Indicator		2016	2017	2018	Δ2018/2017, %
Revenue	mln rubles	389,076	360,386	282,036	8%
Gross profit	mln rubles	156,479	152,730	105,583	2%
Percent of gross profit to revenue		40%	42%	37%	-5%
Business expenses	mln rubles	-39	-18	-22	117%
Management expenses	mln rubles	-11,403	-11,570	-10,004	-1%
EBITDA	mln rubles	192,897	190,982	134,614	1%
Net profit	mln rubles	39,687	45,981	10,605	-14%
Net cash flow	mln rubles	-23,114	8,742	1,807	-364%
Net assets	mln rubles	1,609,244	1,509,615	1,389,225	7%
Return on sales (by net profit)	%	10.20%	12.76%	3.76%	-20%
Return on assets	%	21.7%	21.5%	18.3%	1%
Return on equity	%	2.55%	3.17%	0.79%	-20%
EBITDA margin (EBITDA/revenue), estimated	%	49.58%	52.99%	47.73%	-6%
EBITDA margin (EBITDA/revenue), budgeted	%	43.28%	46.73%	41.22%	-7%
Debt/equity ratio		0.02	0.05	0.07	-54%
Current liquidity ratio		2.60	2.29	1.83	13%
Equity	mln rubles	1,608,189	1,508,466	1,388,030	7%
Debt	mln rubles	36,437	74,046	95,131	-51%

* Management expenses are shown excluding accrued industry-specific reserves (allocated to prime cost)

₽ 389,076 mln rubles
Revenue from sales of the Company's products in 2018

Revenue from sales of the Company's products in 2018 totaled 389,076 mln rubles.

Revenue from electricity and capacity sales by the Company at the WECP, taking into account the Bilibino NPP,

during 12 months of 2018 totaled 385,818 mln rubles, including revenue from own products sales – 381,304 mln rubles and revenue from purchased products sales – 4,514 mln rubles.

Actual Revenue Structure

Total Revenue From Sale of Power (Capacity) in Accordance with Accounting Statements	Total (Mln Rubles)
	385,818
<i>Including</i>	
Revenue from sales of own products	381,304
<i>Including</i>	
Bilibino NPP	2,443
Regulated agreements (power)	10,031
Regulated agreements (capacity)	24,970
Day-ahead market	195,147
Deregulated bilateral contracts	1,259
Balancing market	1,437
Capacity supply agreements (capacity)	115,810
Capacity according to capacity supply agreements	30,207
Revenue from sales of purchased products	4,514
<i>Including</i>	
ATOMENERGOPROMSBYT	1
Regulated agreements (power)	1,088
Day-ahead market	3,035
Balancing market	390

Key Factors Influencing Actual Revenue Increase

The increase in actual revenue from electricity and capacity sales by Rosenergoatom over 12 months of 2018 equaled to 28,268 mln rubles, if compared to the similar period of 2017.

₽ 28,268 mln rubles

The increase in actual revenue from electricity and capacity sales by Rosenergoatom over 12 months of 2018

Volume Factors:

- Increasing the volume of electricity sales in the day-ahead market;
- Starting capacity supplies under CSAs from the Rostov NPP unit No. 4 and increasing the capacity supplies under CSAs from new NPPs in general, including the Novovoronezh NPP-2 unit No. 1.

Price Factors:

- Increasing the average price in the day-ahead market and the balancing market (2018 – 1,178 rubles/MW; 2017 – 1,123 rubles/MW);
- Increasing the average capacity price under CSAs (2018 – 2,057,942 rubles/NW per month, 2017 – 1,908,065 rubles/MW per month), including the Beloyarsk NPP unit No. 4 (2018 – 4,037,843 rubles/MW, 2017 – 3,878,501 rubles/MW), the Kalinin

NPP unit No. 4 (2018 – 1,440,431 rubles/MW, 2017 – 1,174,973 rubles/MW);

- Increasing the capacity price under regulated agreements (2018 – 318,108 rubles/MW, 2017 – 306,424 rubles/MW).

The actual amount of electricity sold by Rosenergoatom in the WECM, including the Bilibino NPP, totaled 209,776 mln kWh for 12 months of 2018. Over 12 months of 2018, electricity and capacity payments totaled 451,755.3 mln rubles (including the Bilibino NPP, Atomenergopromsbyt, with VAT).

Profit Analysis

The net profit according to the results of business activities in 2018 totaled 39,687 bln rubles versus 45,981 mln rubles in the similar period of 2017. Reduction in the net profit by 6,294 mln rubles is caused by an increase in miscellaneous costs (liquidation of decommissioned fixed assets, construction in progress and intangible assets).

Assets Analysis

A growth in the net assets value of 99,629 mln rubles in 2018 was caused by an increase in the eligible assets value by 100,150 mln rubles resulting from higher fixed assets value. This was related to commissioning of the Novovoronezh NPP power unit No. 4 and the Leningrad NPP-2 unit No. 1, taking account of the expenses for connection of NPPs to power grids, as well as implementation of investment projects for extension of service lives of NPP units, and the program for ensuring safe and reliable operation of existing power units.

Evaluation of Net Assets of Rosenergoatom, Mln Rubles

Indicator	Actual Indicator Value		Variation
	As of December 31, 2018	As of December 31, 2017	
Net assets	1,609,244	1,509,615	99,629
Registered capital, including	829,447	815,842	13,606
Registered capital	793,123	793,123	0
Equity payment before registration of changes in incorporation documents	36,325	22,719	13,606
Net assets over registered capital	779,796	693,773	86,023

₽ by 1.94 times

As of December 31, 2018, the net assets of Rosenergoatom exceeded the registered capital by 1.94 times.

This ratio positively characterizes the financial situation, fully meets the statutory requirements for the net asset value of an organization.

Taking into account that the net assets both exceeded the registered capital and increased during the reporting period, we may say that the financial status of the Company is healthy.

Balance Sheet Structure

The amount of assets of Rosenergoatom increased by 6% (100,150 mln rubles) in 2018. An increase in the amount of assets is caused by an increase in value of both non-current assets by 4% (63,587 mln rubles) and current assets by 20% (36,563 mln rubles).

An increase in the value of non-current assets is caused by growth in the value of buildings, machinery and equipment by 31% (229,171 mln rubles) due to commissioning of the Leningrad NPP-2 and Rostov NPP units, and accounting of

expenses for connection to power grids (Rostov NPP, Leningrad NPP-2).

As of December 31, 2018, the non-current assets totaled 88% of the total asset value.

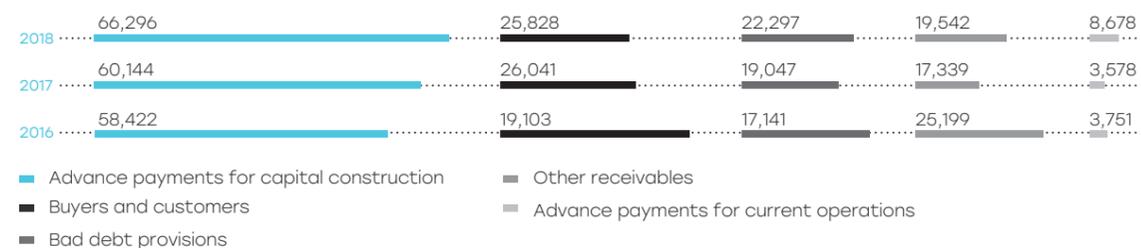
Over 2018, the current assets value increased by 36,563 mln rubles, or 20%. The share of short-term financial investments in the Company's current assets considerably increased in 2018 by 56,158 mln rubles due to lending to Atomeenergoprom in line with the Financial Policy.

Changes in Assets of Rosenergoatom in 2018



The investment activities of Rosenergoatom in the form of capital investments is aimed at implementing the Russian Federation Program for Nuclear Power Industry Complex Development.

Structure of Accounts Receivable

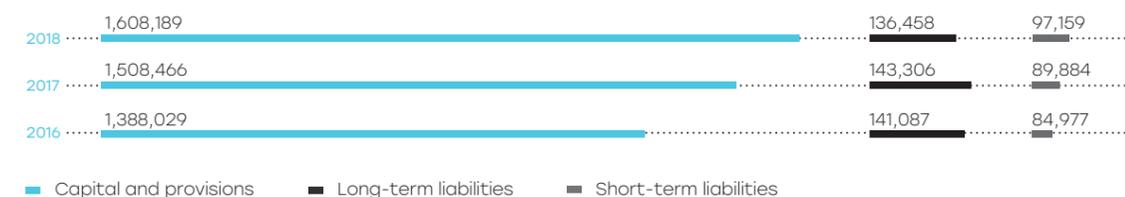


Changes in Liabilities

The cost of Rosenergoatom assets as of the end of the reporting period totaled 1,608,189 mln rubles.

The Company's structure of sources of funds is dominated by the equity ratio of 87%.

Changes in Liabilities of Rosenergoatom



The assets value increased as a result of an increase in the equity value by 99,723 mln rubles due to construction of fixed assets and construction work in progress through depreciation deductions and provisions aimed at ensuring nuclear power plants safety at all stages of their life cycle and development, and created in accordance with the Russian Federation Government

Regulation No. 68 dated January 30, 2002 on Approval of Rules for Funds Allocation by Operating Companies for Provisions Aimed at Ensuring Nuclear Power Plants Safety at All Stages of Their Life Cycle and Development.

201-1

Value Created and Distributed by Rosenergoatom in Accordance with RAS, Bln Rubles

Indicator	2016	2017	2018
1 Created economic value	294.3	375.8	408.5
2 Incomes (sales revenue, gains from financial investments, and sold assets)	294.3	375.8	408.5
3 Distributed economic value	178.3	217.2	255.9
4 Operating costs (payments to suppliers and contractors, cost of purchased materials)	120.8	141.4	173.1
5 Salaries and other payments and benefits for employees	29.1	30.1	32.1
6 Payments to capital providers	1.6	3.8	4.6
7 Gross tax payments (excluding individual profit tax and VAT)	26.2	41.4	45.5
8 Investments in communities, including donations	0.5	0.5	0.7
9 Distributed economic value (Line 1 - Line 3)	116.0	158.6	152.6
10 Contribution to GDP (Line 5 + Line 6 + Line 7 + Line 8 + Line 9)	173.5	234.5	235.4

Budgeting

The budgeting process is performed in line with the approved Unified Industry-Level Procedure of Mid-Term Business Planning in Rosatom State Corporation and Its Organizations. The budget is detailed quarterly planning of the first year of the business plan developed for five years. The process is run through the Distributed Planning and Budgeting System of Rosatom State Corporation.

The budget, income and expense estimates for manufacturing and sales of products by types of activity across branches, Headquarters, and the Company as a whole are developed and approved on the annual basis through corporate procedures in order to execute the Company's production program, and guarantee financing of top-priority business and development areas. Cost estimates are the documents laying the basis for spending funds of Rosenergoatom and its branches for the planned period.

Funds are spent strictly within the limits communicated to structural units in accordance with the approved consolidated income and expense estimates subject to adjustments made pursuant to the approved procedure.

The company is also engaged in operational financial planning (planning horizon of 1 month). Spending is funded according to the cash flow budget.

Cost Management in 2018

Expenses of structural units of the Company's Headquarters and branches are controlled on a monthly basis, consolidated estimates are analyzed (plan/actual), and forecasts until the year end are made on a quarterly basis.

The target level of Specific Semi-Fixed Costs (SSFC) set by Rosatom State Corporation for 2018 required that costs were reduced by 2 bln rubles. In order to reach the target, an action plan was developed, new goals were broken down for branches and responsibility centers of the Headquarters with inclusion into the KPI maps.

During 2018, the branches performed constant monitoring of the expenses level, additional corrective measures were taken if required. As a result, SSFC were maintained on the level of 1,660 thousand rubles/MW, measured at the prices of 2013, which is slightly lower than the level of 2017 (1,667 thousand rubles/MW).

Cost management allowed keeping all economic indicators below the target level.

201-4 4.3. Investment Program Implementation

₽ 167.69 bln rubles were channeled as part of the Investment Program in 2018

The Company's investment programs are prepared in full conformity with the strategic goals of the Power Engineering Division of Rosatom State Corporation, aimed at providing consumers with electricity and heat produced at Russian nuclear power plants with guaranteed safety as a top priority of its activities.

Distribution of functions among the parties involved in the investment process is regulated by the Funds Allocation Agreement between Rosatom State Corporation and Rosenergoatom.

Investment activities of Rosenergoatom are funded from the Company's own funds, from the assets contributed by the Russian Federation into Rosatom State Corporation and borrowed funds.

The Company's investment program for 2018 was approved by the joint Order of the Russian Energy Ministry and Rosatom State Corporation dated No. 9/1/1280-P dated November 12, 2018 on Approval of Rosenergoatom Investment Program for 2019-2023 and changes made in

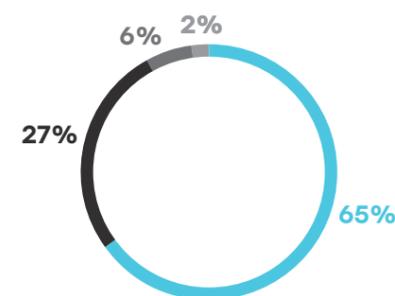
Rosenergoatom Investment Program approved by the joint Order of the Russian Energy Ministry and Rosatom State Corporation No. 35/1/1388-P dated December 29, 2017.

Meanwhile, the funds of the Rosatom State Corporation's asset contribution in the amount of 13,605.84 mln rubles, inter alia, were channeled to investment projects related to construction of NPP units.

Rosenergoatom Investment Program was 101.5% completed in 2018.

The Company implements measures aimed at increasing the efficiency of investment projects related activities. In particular, an industry-level program of measures aimed at increasing the maturity level of project management, involving the Company and organizations within its control circuit, inter alia, was started in 2018. Measures of 2018 were completed by the Company in full, implementation of measures as part of the program continues in 2019.

Investment Activity



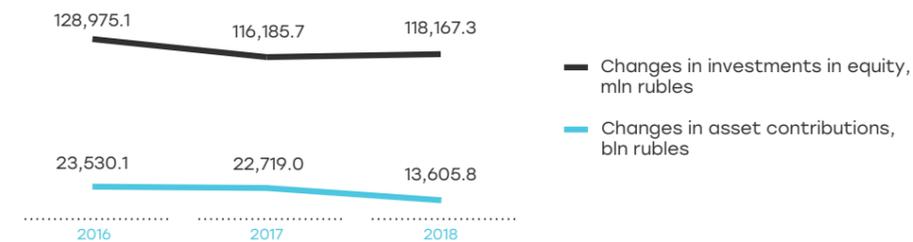
- Investment projects for NPP units construction, including the project for construction of a floating nuclear power plant
- Projects and measures at existing power units: Investment projects for service life extension of the power units pertaining to Generations 1 and 2, Ensuring Safe and Reliable Operation of Existing Power Units
- Investment projects at spent nuclear fuel and radioactive waste handling facilities
- Other investment projects and measures, including research and development



Investment Programs

The Company implements measures aimed at increasing the efficiency of investment projects related activities. In particular, an industry-level program of measures aimed at increasing the maturity level of project management, involving the Company and organizations within its control circuit, inter alia, was started in 2018. Measures of 2018 were completed by the Company in full, implementation of measures as part of the program continues in 2019.

Changes in Investments in 2016-2018



Rosenergoatom Investment Projects Funded from Consolidated Investment Resource (CIR) of Rosatom State Corporation

₽ 2.42 bln rubles were channeled from the consolidated investment resource of Rosatom

The Company's projects were funded in the amount of 364.2 mln rubles (with VAT), and subsidiary companies' projects – in the amount of 2.1 bln rubles (with VAT) using the CIR funds in 2018.



EU25	103-1
103-2	103-3

4.4. Developing Human Capital. Knowledge Preservation and Transfer

The Company's activities are underpinned by unified industry-level values of Rosatom State Corporation and its organizations. In case of absence of clear instructions, decisions are made on the basis of the values. Knowledge of and adherence to the values are mandatory for all employees of the Company.

The values were integrated into HR processes and business objectives of the Company in 2018. Behavioral indicators were developed allowing for the Company's employees to compare their actions with corporate values.

Average Headcount of Rosenergoatom and Division

Total for Rosenergoatom:	33,923.5
Total for organizations within the Company's circuit	14,936.0
Total for the Division:	48,859.5

Changes in Average Headcount and Average Salary

	2016	2017	2018
Average headcount	48,589.4	48,433.0	48,859.5
Average headcount growth		-0.32%	0.88%
Average salary	77.6	82.5	87.2
Average salary growth		6%	5%

102-16

Values Integration into HR Processes



Recruitment

Interview for values

Personnel career development

Trainings for employees and managers – Values Based Management

Annual assessment of performance - RECORD

- Assessment against values
- Survey 360
- Feedback for values
- Individual development plans for values

Motivation and incentives

- Rosatom Man of the Year
- Headquarters' Best Employee

Development of talent pool

- Candidates evaluation
- Talent pool members development
- Changes support team
- Mentoring

Succession planning

- Evaluation and promotion of candidates to the talent pool
- Feedback for candidates

Values Integration into Business Objectives

Values Integration into Business Objectives

Values	Behavioral Indicators - the behavior of an employee meets the values, if he:
Safety 	<ul style="list-style-type: none"> • Considers safety as one of his activity priorities • Sets an example of safety requirements observation: industrial, environmental, informational, financial, reputational • Eliminates and prevents violations of safety requirements of the enterprise and the industry
One step ahead 	<ul style="list-style-type: none"> • Sets ambitious goals exceeding the achieved indicators • Studies and adapts to changes in a prompt way. Adjusts initial plans, develops the alternatives, if necessary • Listens to the needs of customers, foresees their needs • Works in a forward-thinking way
Accountability 	<ul style="list-style-type: none"> • Meets the deadlines. Completes the jobs • Bears personal responsibility for achievement and non-achievement of results. Recognizes mistakes. Is not looking for excuses • Is personally involved in problem solving. Is not waiting for others to do the job • Works in a high quality manner • Demands high quality work from others, does not accept negligence
Efficiency 	<ul style="list-style-type: none"> • Uses resources in a rational way to achieve the results • Makes improvements and streamlines processes, optimizes duration and costs • Is highly efficient. Does not waste time • Makes reasonable decisions where there are several options. First thinks. then acts • Does not allow for inaccurate work execution
One team 	<ul style="list-style-type: none"> • Copes with objectives in cooperation with colleagues at his level. Does not go to the manager for every solution • Helps colleagues in solving their problems, does not stay aside • Abides by common interests of the enterprise and the industry in his work
Respect 	<ul style="list-style-type: none"> • Esteems the colleagues' success, thanks for the work completed • Listens to the colleagues and subordinates and understands them, even in case the opinions differ • Shows respect to the history and traditions of the enterprise and industry • Respectively treats all colleagues and subordinates, irrespective of their status, age and personal affections • Respects customers, clients, partners and suppliers • Controls negative emotions, maintains respect and common sense in case of heavy pressure and stress

In addition to the values, the Ethics Code is a baseline for the employees. The Code defines ethic principles of the Company's activities and sets the requirements for the personnel behavior.

102-17

In case the Code standards and rules are violated, any employee may inform any immediate superior, the Ethics Commissioner or the Council for Ethics set up by the Company. Any violation of the ethical standards may be reported by email at ethics@rosenergoatom.ru,

all queries are considered and the applicants are informed of the solution in a confidential manner.

The Company's Ethics Code is available at: www.rosenergoatom.ru/partners/eticheskaya-praktika-kompanii/

Personnel Support. Development and Motivation Programs

285 applications were filed for the Rosatom Man of the Year (5% more than in 2017).

Rosenergoatom employees annually participate in the industry-level recognition program – Rosatom Man of the Year. Among the main criteria for selection of the winners are considerable performance results, efficient approaches to problem solving, and commitment to corporate values.

Following the results of 2018, 285 applications were filed for the Rosatom Man of the Year (5% more than in 2017).

In 2018, the Headquarters' Best Employee contest was held for the first time ever. After three stages of

the contest, 20 winners were selected, 1 employee received the main prize in accordance with the Colleagues' Esteem voting results.

A series of corporate measures for the Company's employees and their children was devoted to the safety culture and comprised the Parents' Meetings, the Family Safety Days and the Children at Office action in 2018.

404-2 Career and Succession Management. Development of Managerial Talent Pool

There were 368 persons on the managerial talent pool of all levels in 2018. 105 employees were added to the pool in 2018. 66 managers from the talent pool received new appointments.

Development of a talent pool of the managers featuring utmost readiness for the job is one of the main elements of career and succession management. The Company successfully implements the unified industry-specific system for development of the talent pool for various levels of managerial positions. Employees who have potential to managerial activities are motivated to

achieve high results, professional growth and development, and become selected to the talent pool. Selection is made pursuant to the annual performance evaluation and approval of succession plans at all levels of management.

Managerial Talent Pool Efficiency Indicators Set for 2018

Indicator	Actual
Appointments from talent pool to top management level positions	87.5%
Talent pool members of the Talents and Capital levels of 2016-2018 and the Heritage level of 2013-2018 who received new appointments	72.7%

368 persons were on the managerial talent pool of all levels in 2018

404-3

Employees are planning their careers within the Company: from engineer to deputy CEO. The coverage totals 20,600 managers and experts, which is 37.7% of the headcount.

Special attention is paid to managerial potential development and career opportunities implementation for the TOP 1000 level managers.

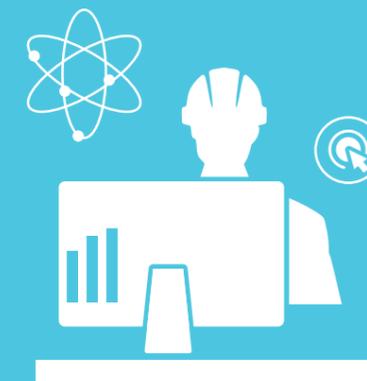


Personnel Management Processes Automation by HR Potential Development System RECORD (ETWeb)

In 2018, the Company's NPPs and branches launched a single industry-level talent management system – RECORD, which is based on Lumesse ETWeb software. The system comprises the following modules:

- Career and Succession Management;
- Personnel Efficiency Management;
- Personnel Training Management;
- Personnel Recruitment Management.

The Record system covers 35,000 employees in all of the mentioned modules.



Personnel Development

Human Resource Development System



by 44 people was increased the number of the Company's internal coaches

In 2018, employees were trained in line with the industry-specific programs: leadership potential development program (for the managerial talent pool), Global Professionals, New Products, Cost Engineering School, HR School, Rosatom Production System, English Language Learning. Additional training of employees is carried out on an annual basis (for preparation to vocational knowledge and skills assessment, development of corporate values, etc.).

The personnel training and development system is being localized in order to cut down costs and raise the level of programs comprehension. The number of the Company's internal coaches was increased by 44, they are involved in 96 programs.

Training by Internal Coaches in 2018

Program	Certified Internal Coaches in 2018	Employees Trained by Internal Coaches
Rosatom values	3	11
School of managers	8	205
Performance management	11	557
RPS	26	6,238

As a part of the E-Learning Strategy 2020, the Company started implementing a plan for increasing the share of e-learning, expanding the coverage of employees, reducing the time and cost of training. In 2018, e-training covered 1,254 persons per course (3,964 persons per course in the Power Engineering Division).

215 managers of the Company were trained under the Mentorship program. In September 2018, the Company held the Knowledge Day featuring employee workshops for improvement of their involvement. The Winter School of Rosenergoatom Coaches was held in 2018 for the internal coaches' career and coaching skills development.

Personnel Training

A Company's system for personnel training, psychological support and career development is one of the elements ensuring safety, reliability and efficiency of NPPs operation. Personnel training is carried out as part of the educational programs developed by the education and training departments (centers) (hereinafter – the ETD) of the Company and the educational organizations.

destructive and destructive control methods, and specialized control methods. The Company's employees passed certification in the amount of 3,124 man-methods in 2018.

In accordance with Rostekhnadzor requirements, the Company's employees annually pass certification for non-de-

The costs of external training and certification of the Company's employees totaled 340,306 mln rubles in 2018 (10 thousand rubles per person a year on average).

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Consolidated Personnel Training Data for 2018

Indicator	Hours of Training	
	Total	Costs per Employee
Total hours of in-house training (in TAU at NPPs and structural units)	2,930,762	86.4
Total hours of external training	600,187	17.7
Total hours of training, including:	3,530,949	104.1
Managers	752,185	139.8
Specialists and officers	1,284,294	83.9
Blue collar workers	1,494,470	112.8



Special attention in the Company's personnel training is given to safety culture. In 2018, 23,278 employees of the Company passed training in the newly-developed and organized course – Tools of Safety Leadership Shaping and Support, Coaching Approach, Socio-psychological studies of the basic components of safety culture was held with participation of 4,535 employees. The studies results were reported at a meeting of the Council for Safety Culture. In 2018, the Company developed and implemented two training programs for the personnel involved in localization and impact restriction of beyond design basis and severe accidents at nuclear power plants.

In 2018, under the Company's regulatory acts, the Leningrad NPP ETD passed certification, and the use permits were issued for:

- Full-scale simulators of the Novovoronezh NPP unit No. 4 and the Smolensk NPP unit No. 3;

- Versatile simulator of the Kola NPP;
- Training complex Stage 1 was created for the Balakovo NPP electrical shop equipment;
- Interactive complexes for personnel training in first aid treatment at the Bilibino and Novovoronezh NPPs, and a training stand for electrical personnel at the Rostov NPP were put into operation for the training process.

As part of the Division Digitalization Program for 2018-2022, a project was launched for Software and Hardware Complexes of 3D Holograms Visualization.

NPP personnel training and knowledge assessment at education and training departments (centers) are carried out with the use of teaching and learning documents, computer training systems, multimedia information systems, versatile interactive and automated complexes. In 2018, 1,193 teaching and learning materials were developed, 1,281 materials and

1,509 job preparation programs were revised, 48 computer training systems were developed.

ETD coaches possess the required experience for work and they had passed specialized psychological and pedagogical training. There is an Instructor School operational at the Company. 387 NPP instructors attended advanced training courses in 2018.

Nuclear plants personnel training activities hinge on the 'systemic approach to training' and are performed during the job preparations, skills sustainment and improvement. On average, each employee of an operational NPP received 108 hours of training on average, including 90.8 hours of internal training and 17.2 hours of external training in 2018.

Consolidated Data of Training Hours

Personnel Category	Total Hours of Training at ETD (Hours)	Training at NPP Structural Units (Hours)	External Training (Hours)
Operations	879,631	690,256	94,891
Repair	212,627	262,906	121,072
Administrative	162,715	722,627	350,623
Total	1,254,973	1,675,789	566,586

Certain types of activities are performed by NPP employees upon availability of Rostekhnadzor permits. In 2018, enacted were the Procedural Guidelines for Organization of Work for Provision of Rosenergoatom Employees with Permits for Nuclear Energy Related Activities, and the Program for Nuclear Plant Top Managers Preparation for Certification by Supervisory Bodies. At present, 1,650 employees of the Company have the Rostekhnadzor permits, 240 were received and 208 were extended in 2018.

Maintenance and improvement of the relevant level of the human factor reliability, including the psychological

and pedagogical support of the vocational training processes support, are carried out by the psycho-physiological support laboratories (PPSL) of NPPs. In 2018, PPSL carried out examination of 8,940 employees, and 504 conclusions were issued to obtain and extend Rostekhnadzor permits. The Company's Headquarters organized the psychological release room that hosted 147 employees for psychological recovery in 2018. 13,207 employees of nuclear plants passed psychological training in the amount of 15 thousand hours in 2018.

WorldSkills 2018

In 2018, the qualification tournament of vocational skills REASkills 2019 was held among 14 core competences of the Division (90 participants and over 100 experts representing the existing NPPs and subsidiaries). The Division team was represented by 54 participants and 70 experts at AtomSkills 2018 – the 3rd industry-level championship. As a result, the Division employees were awarded 17 medals (7 gold, 4 silver, 6 bronze).

In 2018, 5 participants – employees of the Division, as part of the industry-level team participated in the 1st National Championship of Vocational Skills held in line with the WorldSkills procedures among the experts aged at 50+ and

won two gold medals. As part of the nuclear industry team, 34 employees of the Division participated in WorldSkills Hi-Tech 2018 national championship (12 participants and 21 experts). They won two gold medals.

As a part of the 2nd national championship of IT technologies DigitalSkills, 3 participants and 4 experts of the Division on the team of Rosatom won two gold medals.

404-3

Personnel Remuneration. KPI System and Activities Efficiency Evaluation

The Company's system for operational performance management (OPM) is aimed at attaining the planned performance level of the Company¹.

The share of employees observing the KPI was equal to 12.5% of the headcount (6,850 persons). The share of employees subject to annual evaluation of operating efficiency was 27% (14,894 persons).

The evaluation system used to assess managers' performance is based on the annual evaluation system (which, among other things, is based on key performance indicators achievement)².

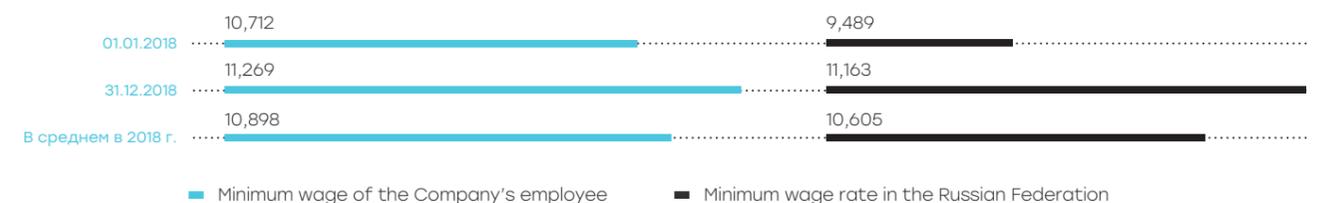
The system of incentives is based on bonuses for achieved KPIs, where each indicator has a weighted value assigned against the total sum of bonuses. The total amount of bonuses is determined on the basis of the annual total of base salaries for each position, adjusted by a specific coefficient; the top limit depends on the position level, and can be as high as 260% if the target KPI level is achieved. Bonuses are only paid upon achievement of KPI threshold values that are also specified in the individual KPI matrix. If achievements significantly excel the target, the bonus can be increased.

202-1

Minimum Amount of Remuneration, Thousand Rubles per Year

Employee Category	Base Pay	KPI Achievement Bonus
2016		
Managers	463.2 up	149.4 up
Specialists	249.9 up	44.3 up
Blue collar workers	115.8 up	10.3 up
2017		
Managers	501.0 up	149.4 up
Specialists	270.3 up	44.3 up
Blue collar workers	125.2 up	10.3 up
2018		
Managers	520.5 up	149.4 up
Specialists	281.3 up	44.3 up
Blue collar workers	130.8 up	10.3 up

Minimum Salary of Rosenergoatom Employees in 2018 versus Minimum Salary in Russian Federation



¹ The Company's KPI system is described in 2017 Annual Report, Pages 146-147.

² Information regarding the KPI use for motivation of the Company's managers and employees is provided in Section 5.1 – Corporate Governance.



Personnel Involvement

The annual study of personnel involvement was performed in January-February 2019. Some 12 thousand respondents participated in the study. The studies showed that in terms of its working environment and team spirit the Company remains in the efficiency zone with the involvement ration of 83%.

According to Aon Hewitt, an international company surveying global involvement, Rosenergoatom performance exceeds the average involvement level of Russian production companies and corresponds to the level of the nation's best employers.

School – University – Division

The Company is interested in attracting the best students and graduates for work at NPPs and other organizations forming part of its management circuit. Professional orientation starts at school: in the cities where NPPs are located Nuclear Classes are created to provide a deeper study of physics, and specialized academic competitions in physics and mathematics are held.

Another Engineering Academic Competition for 500 secondary school children was held in the NPP location areas in 2018. The competition was sponsored by the Company. The prize winners of this competition enjoy considerable advantages when entering higher educational institutions of the Russian Federation. Moreover, the academic competition results give additional points when getting employer-sponsored education in NPP related fields of study.

Over 300 students attend leading technical universities under employer-sponsored contracts with the Company. If such employer-sponsored students are successful in their studies, they receive additional financial support in addition to their study allowance, attend practical training at NPPs, and obtain an employment offer upon graduation from the university.

The Association of Supportive Institutions of Higher Education of Rosatom was created to provide the industry with highly skilled graduates. The Association comprises 17 institutions

of higher education, and out of them, 7 are crucial for the Company: MEPHI National Research Nuclear University, Tomsk Polytechnic Institute, Ivanovo Power Engineering Institute, Ural Federal University, Saint Petersburg Polytechnic University, Voronezh State University (entered the Association in 2018), Moscow Power Engineering Institute.

Coordination agreements are made with key institutions of higher education. Agreements were made with Moscow Power Engineering Institute, MEPHI National Research Nuclear University and Ivanovo Power Engineering Institute in 2018.

Each year the Company participates in professional orientation activities for students of leading technical universities. All branches of the Company participated in traditional Rosatom Career Days in 2018.

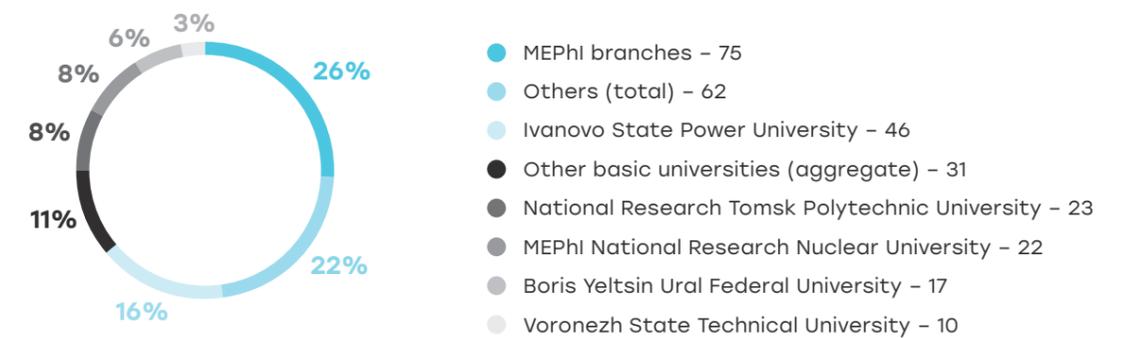
In 2018, the Company's 3rd contest was held for awarding of corporate student scholarships, and university teacher grants based on the results of the academic year of 2017/2018. Following the results, the best teachers (21 persons) and 50 students received the grants (200,000 rubles) and scholarships (100,000 rubles) for the academic year.

The Company provides opportunities for on-the-job training. In 2018, 1,822 students passed on-the-job training at the Company's enterprises.



286 graduates of higher education institutions with an average diploma grade of 4.43 in 2018 were hired by Rosenergoatom

Number of Higher Education Institution Graduates Employed in 2018, %



According to preliminary estimates, education of over 6,000 specialists will additionally be required by 2030 taking into account power units construction abroad.

Top 5 Required Training Areas

Training Areas	Pers.
Nuclear power plants: design, operation and engineering	2 924
Electrical power and electrical engineering	1 759
Thermal power and thermal engineering	1 561
Electronics and automation of physical plants	976
Automation of industrial processes and production facilities	726

Critical Knowledge Preservation among Personnel

The Company has implemented the knowledge management system as part of the respective program of Rosatom State Corporation. One of the knowledge management system elements is a system of preserving critical knowledge of the employees, which is aimed at improving the efficiency of knowledge use and transfer, ensuring intense knowledge circulation, reducing the risk of knowledge loss in case of personnel rotation and retirement, stimulating the processes of new knowledge creation, critical knowledge transfer through the system of vocational training and mentorship.

The critical personnel knowledge preservation activities were implemented at all operational NPPs for the first time ever in 2018. As a part of the critical personnel knowledge preservation activities:

- 53 carriers of critical knowledge were identified and passed the procedures of the loss risk assessment and the critical knowledge extraction, recommendations were given for involvement of carriers in mentorship and internal coaching;
- Work was continued to compile a single base of teaching and learning documents (TLD). The functional module of the ACSTD contained 10,984 teaching and learning documents;
- Knowledge maps were developed for the job positions requiring vocational training at NPP ETDs;
- A project was launched for automation of processes for critical personnel knowledge preservation.

The critical personnel knowledge preservation activities were implemented at all operational NPPs for the first time ever in 2018.

Mentoring

1,306 employees acted as mentors in 2018

The mentoring practice is used by the Company for adaptation of employees for new activities, ensuring succession of the generations of employees and assisting in their competencies devel-

opment. In total, 1,306 employees acted as mentors in 2018.

Every newly hired young specialist and probationer is assigned with a mentor from among highly qualified employees who helps the young specialist during the on-boarding period, transfers the knowledge necessary for the specialist to carry out work, and monitors performance of assigned tasks.

Number of Mentors in 2018, Pers.

For probationers	860
For newly hired young employees	322
For transfer of crucial knowledge and skills	14
For young employees appointed as junior executives	2
For managerial talent pool members (mentoring)	108

4.5. Developing Social Capital and Areas of Presence. Charity

The social capital and the areas of presence are developed in accordance with the Company's strategy and the Unified Industry-Level Social Policy of Rosatom State Corporation with a view to increase the attractiveness of the employer in the labor market and the engagement of employees, the efficiency of social costs, involvement and retention of competent young experts.¹

401-2

Rosenergoatom Social Expenses in 2016-2019, Thousand Rubles

	2016	2017	2018	2019 (Plan)
Costs per employee	77.17	78.07	80.85	80.82
Total costs of social policy implementation	2,731,219	2,645,342	2,742,767	2,812,135
Including key programs:				
Health programs (VHI, accident insurance)	358,408	358,318	359,387	392,748
NGO	120,975	116,553	128,559	169,936
Health resort treatment and wellness	260,780	342,496	422,246	461,650
Retirees support	332,162	351,296	396,556	395,000
Assisting in improvement of housing conditions	264,303	277,887	230,531	275,071
Organization of culture and sports events	562,662	558,150	588,230	628,365

Social Expenses Breakdown by Key Programs in 2018



VHI

In addition to local Compulsory Health Insurance (CHI) programs and state guarantee programs, the Company provides to its employees Voluntary Health Insurance (VHI), and insurance against accidents and diseases. Employees can insure their family members at their own expense at a discounted price. Under the VHI

program, employees and their family members can receive special information, consulting, and medical assistance both at health care institutions of their region, and at the institutions located in Moscow and Saint Petersburg.

¹ Basic provisions of the social policy and trade union relations are disclosed in the Company's 2013 Annual Report (pages 203-206).

201-3

Private Pension Insurance**8,178 employees**

participated in pension co-financing programs in 2018 (7,948 persons in 2017).

The Company provides private pension insurance to employees through industry-based Atomgarant Non-Government Pension Fund under the Regulation on Co-Funding of Private Pension Insurance of Rosenergoatom Employees, and pension agreements executed between the Company and the Fund. Pension obligations are fully covered from the general resources of the Company, and in accordance with the pension scheme, with the assessed value of such obligations totaling 129 mln rubles in 2018 (117 mln rubles in 2017).

Upon retirement of an employee of the Company, the degree of participation in the pension plan is determined on the basis of the length of service in the nuclear power industry – at least 15 years at the time of achieving the retirement age.

	2017	2018
Total number of the Company's retirees receiving non-government pension in Atomgarant Non-Government Pension Fund, pers.	14,369	14,189
Average non-government pension amount, rubles	2,674	2,371
Pension funds paid by Atomgarant NGPF as non-government pensions to retirees in 2018, rubles	301.3	298.6

Pension Contributions Data

Participant Age	Ratio of Pension Contributions (% of Employee's Monthly Salary)	
	Employee	Employer
18–29	0.8	1.6
30–35	1	2
36–39	1.3	2.6
40–44	1.5	3
45–49	1.7	3.4
50+	2	4

Veterans' Movement

Taking care of its veteran employees is an important thrust of the social policy. In 2018, the actual number of retired employees in the Inter-Regional Public Organization of the Company's Veteran Employees (IPOCVE) totaled 18,222 persons (17,811 persons in 2017). From the funds allocated by the Company under charity contracts, IPOCVE provided 77.2 mln rubles as financial aid to retirees in dire straits (85.5 mln rubles in 2017), 85.4 mln rubles for health resorts and medical rehabilitation (72.9 mln rubles in 2017).

The Company spent 23.9 mln rubles for organization of recreational and cultural events (20.3 mln rubles in 2017).

The veterans received patronage assistance.

Counting all expense items, financial aid was provided to retirees in 48,621 cases (42,910 cases in 2017).

103-1	103-2	103-3
203-1	203-2	413-1

Developing Areas of Presence

₽ **>75 bln rubles**
of tax deductions were made
between 2013 and 2018

The Company's investment programs typically include construction of social facilities in the cities of presence. The core infrastructure facilities in the cities of NPPs presence are created during the process of plants construction. Today, the Company faces the objective of balancing the development rates of core production facilities and areas of their presence.

In order to raise the development level in the areas of presence, Rosatom State Corporation makes cooperation agreements with the Russian Federation constituents. The agreements are effective for six years. Under the agreements, tax payments are made by the enterprises as part of the consolidated group of taxpayers. Funds are channeled for improvement of the social and engineering infrastructure, construction of sports facilities, and landscaping in the cities of the Company's presence.

In line with the agreements, additional tax payments to regional budgets in 2018 equaled 26.18 bln rubles (19.64 bln rubles in 2017), out of this amount, 2.11

bln rubles were channeled for municipal entities' events (1.97 bln rubles in 2017).

On the basis of the list of expenses related to the investment project of the Rostov NPP unit No. 4 construction, funds in the amount of 676.8 mln rubles were transferred to the Rostov Oblast budget for designing and reconstruction of the Volgodonsk – Rostov NPP approach road.

The Belaya Vezha health rehabilitation complex of the Rostov NPP was upgraded (investments totaled 300 mln rubles).

The Balakovo NPP health care center Stage 2 was commissioned in Balakovo, Saratov Oblast (total amount of investments exceeds 560 mln rubles).

Following the results of the meetings held by top managers of Rosatom State Corporation with the population in NPP location areas, social and infrastructure support projects were implemented in 2018. The projects worth more than 214 mln rubles were sponsored by Rosenergoatom.

Charity

₽ **650 mln rubles**
were spent on charity in 2018

The Company's charitable activities hinge on the co-funding principle in relations with charity recipients. In addition to the Company's partnership with other enterprises, employees of the NPPs and the Headquarters participate in charitable projects.

Rosenergoatom Expenses for Charity in 2016–2018, Mln Rubles

Areas	2016	2017	2018
Traditional events under the charity policy	273.2	230.8	253.8
Charitable activity in the regions of NPPs (including aid for the pensioners and the poor, children's and sports institutions, etc.)	139	159.1	219.9
Industry-level programs	85.8	115.1	176.3
Total	498.0	505.0	650.0

The Company provides charity in the following areas:

- Supporting socially disadvantaged population groups: orphaned children or persons in dire straits, disabled persons, the Chernobyl disaster liquidators, veterans of war and labor, large families, etc.;
- Restoring and renovating the places related to Saint Sergius the Radonezh and Seraphim of Sarov, building of churches in the cities and towns of presence;
- Support and promotion of sports and a healthy lifestyle, and patriotism;
- Events aimed to improve social and sport infrastructure, and landscaping in the satellite towns of NPPs;
- Support for cultural projects that promote moral values and responsibility.



103-1

103-2

103-3

4.6. Interaction with Stakeholders

The approach to interaction with stakeholders is based on the principles of regular and constructive dialog, partnership, mutually beneficial cooperation, trust and sincerity, public availability and transparency, fulfillment of assumed obligations.

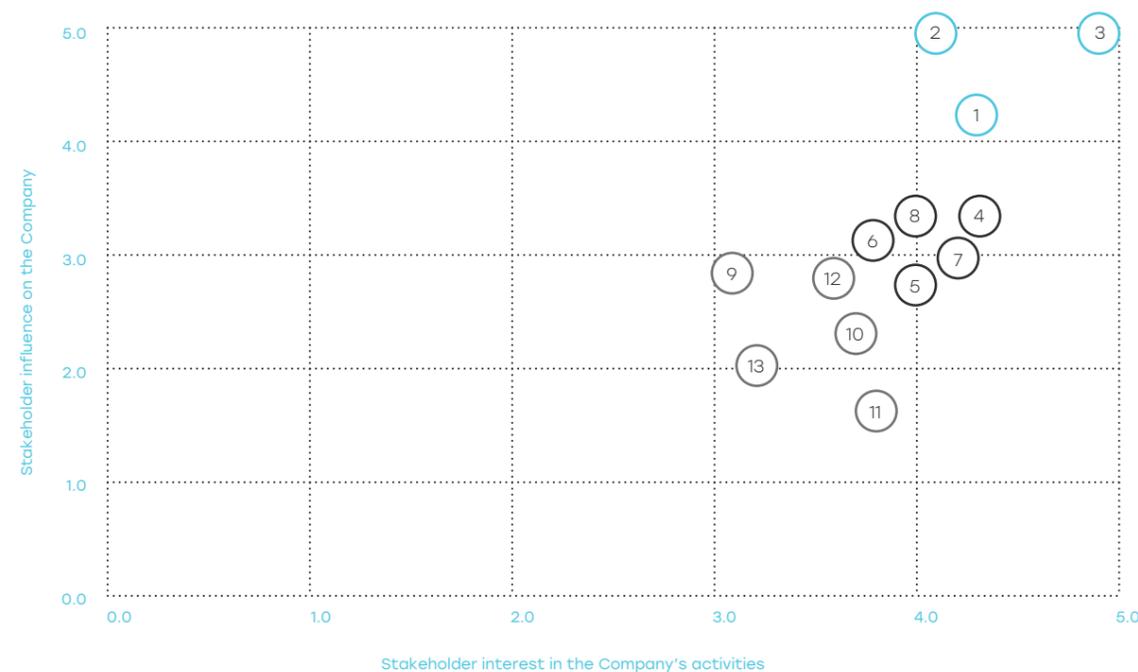
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During the Report compilation, the Company updated the stakeholders' ranking map on the basis of the poll among the managers and lead experts in 2018.

Rosenergoatom Stakeholders' Ranking Map



- 1) Federal authorities, authorities of Russian federal constituents and municipalities
- 2) Supervisory and regulatory authorities
- 3) Stockholders (Atomenergoprom, Rosatom)
- 4) Employees, trade union
- 5) Population, local communities in areas of presence
- 6) Environmental and public organizations
- 7) Business partners and potential investors
- 8) Suppliers, customers
- 9) Business associations
- 10) Educational, scientific and expert communities
- 11) Potential employees, students, schoolchildren
- 12) Mass media
- 13) Analysts, rating agencies

413-1

Public Discussions¹

When planning its activities that can make a considerable impact on the environment and local communities, the Company initiates public discussions.

Six public discussions were held in the areas of the Company's presence in 2018 (over 2,600 participants). Every event of public discussions includes 100 or more activities involving communities, public authorities and mass media, and explaining the planned measures and their safety principles for human and environment.

Fund "ANPPT"

Fund for development of municipal entities "Association of nuclear power plant's territories" (fund "ANPPT") was established in 2013 at the initiative of Rosenergoatom. The founding partners are Rosenergoatom and local authorities of municipal entities where the NPPs are located.

In 2018, the Fund included the Pevek Town municipal entity in the Chukotka Autonomous Okrug on the basis of the application by the town administration head. At present the fund "ANPPT" embraces 15 municipal entities and 12 operational NPP units and those under construction in Russia.

In 2018, a new composition of the Fund Council and auditing commission were approved and a new chairman was elected – Nikolay Nikolayevich Netyaga, head of the Novovoronezh urban district, Voronezh Oblast. Six meetings of the fund "ANPPT" Council were held in 2018.

The Youth Council of the fund "ANPPT" including representatives of all NPP

Interaction with State Authorities

In 2018, 123 visits by representatives of state authorities were held in the Company's areas of presence (over 1,500 persons). On March 27, 2018, a visiting meeting of the Russian Federation State Duma Committee for Energy was held at the Leningrad NPP, and a technical tour was arranged to the Academician Lomonosov floating nuclear power plant.

location areas was created in November 2018 with a view to develop youth initiatives.

The Fund pays special attention to developing international civil diplomacy. The Expert Council of the fund "ANPPT" including representatives of Hungary, Belarus and Abkhazia was created in 2018. Memoranda of twin-city relations were signed between Volgogradsk (Rostov Oblast) and Tamashi (Hungary), Polyarnye Zori (Murmansk Oblast) and Dukovany (Czech Republic).

The 2nd International Contest of Children's Photos – Hugged by Nature, and the environmental camp for the winners were arranged in Hungary in 2018. Participating in the contest were over 1,000 children aged between 14 and 17 from the cities where Russian NPPs and the Hungarian Paks NPP are located. The project won the 3rd prize in the MediaTEK contest in 2018 and the diploma of the 15th contest for V.I. Vernadsky National Environmental Award.

Results of the 6th open contest of social projects of the ANPPT Fund were summarized on February 14, 2018. 52 projects became the winners and were awarded 45 mln rubles. All projects were successfully implemented.

¹ Public discussions are a set of activities forming part of evaluation of environmental impact of prospective economic and other activity held with a view to inform the public about planned activities and its possible impact on the environment, to identify public preferences and consider them for impact assessment, and to protect the rights, liberty, and legitimate interests of citizens within areas targeted for specific business operations of significance.

Liaison with Non-Governmental and Environmental Organizations

The Company is active in partnering with non-governmental environmental organizations that have a real possibility to obtain unbiased information about the state of ecological, radiation, and energy safety of NPPs.

The Company's Stakeholders Commission comprises representatives of various environmental and public organizations and movements, including Nongovernmental Ecological Fund named after V.I. Vernadsky, Bellona Ecology and Law Center, Oka Inter-Regional Environmentalist Movement, Green Cross Inter-Regional Public Environmental Organization.

In 2018, 122 roundtable discussions were held with participation of public and environmental organizations representatives (over 1,500 participants).

Annual reports on environmental safety of all 10 operating NPPs are issued and published on the Company's website (publication of reports for 2018 is scheduled for the second half of 2019), as well as in interactive annual reports of Rosenergoatom. Public presentations of environmental reports are held in all municipal entities and regional centers of NPPs location.

The Company's Communications Strategy was developed in 2018. The Strategy is based on the requirements and recommendations of the IAEA in safety and communications areas. The document is aimed at arranging interaction and ensuring unified understanding of objectives among all employees involved in the Company's communications, and integrating the process of communications into the management model.

Mass Media Relations

The Company's interaction with mass media is guided by the policy of maximum transparency and availability. The information on operation of nuclear plants and radiation environment in the towns of NPP location is available on the Company's official website (www.rosenergoatom.ru). Press releases and information communications are posted there without delays. Real-time information about radiation monitoring of Russian NPPs may be found at: www.russianatom.ru.

In 2018, more than 56 press tours were held at NPP sites (over 700 participants). The corporate website contains above 1,500 press releases and over 30,000 publications regarding the activities of the Company and NPPs.

According to the comprehensive mass media and social networks analysis system Interfax-SCAN, the Company is number six among the top 25 companies involved in heat and electricity production in Russia in terms of Mass

Media coverage in 2018. If compared to 2017, the number of media hits grew and totaled 44,410¹

The Company annually holds the Energetic People creative contest of regional print media in the areas of presence for the best coverage of the nuclear power industry related subjects in regional media. In 2018, the contest results were summarized at the Beloyarsk NPP during the Energetic People festival of regional and corporate print media. The festival was attended by some 100 representatives of print and online media, radio, television and press services of nuclear industry enterprises from Russia and Belarus.

The Company annually holds the Energetic People creative contest of regional print media in the areas of presence for the best coverage of the nuclear power industry related subjects in regional media.



An anti-crisis information campaign

Jointly with Rosatom State Corporation and Rusatom - International Network, Private Enterprise, an anti-crisis information campaign for media support of the Academician Lomonosov floating power unit transportation from Saint Petersburg to Murmansk with a view to change the negative public opinion. Participating in the project were Russian and international mass media, international environmental organizations, which showed absolute safety of the floating power unit. This project won East Europe's largest communications award - Eventiada IPRA Golden World Awards, taking the 1st place in the Best Project Meeting International Standards nomination and the 2nd place in the Best International Project nomination.



Public Opinion Surveys

74.5%
the share of supporters of nuclear power use in Russia

According to the results of social studies performed by Levada-Center, the balance between positive and negative evaluations of the nuclear industry development programs among the Russian population averaged 57% in 2018 (the indicator varied from 49.2 to 62.1% during the recent six years). The share of supporters of nuclear power use in Russia totaled 74.5% (73.9% in 2017). The indicator varied from 66.5 to 75.5% during the recent six years. Thus, the result of 2018 corresponds to a general trend of the recent years and

confirms a persistently high level of support of the nuclear power industry development programs among the Russian population. Preservation of the balance between positive and negative evaluations is forecast at the level of 55-59% in 2019.

Blogosphere and Social Networks

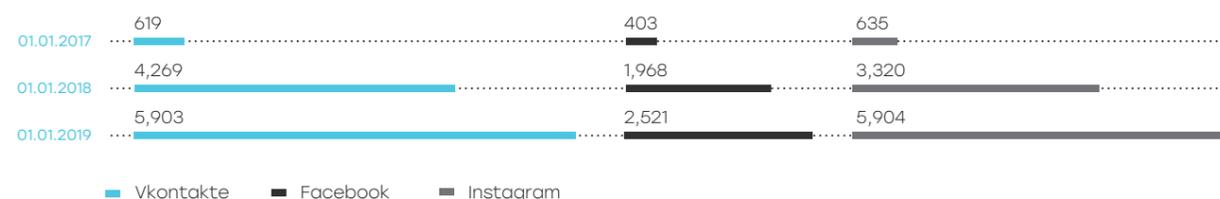
-  vk.com/rearu
-  facebook.com/rosenergoatom.ru/
-  instagram.com/rosenergoatom_ru/
-  youtube.com/c/RosenergoatomOfficial
-  twitter.com/Rosenergoatom

The total number of Rosenergoatom corporate accounts followers in social networks (VKontakte, Facebook, Instagram) in 2018 grew by 1.5 times versus 2017 and exceeded 14,000 persons (9,500 persons as of the end of 2017). The social networks pool used by the Company was extended with Twitter in 2018 for prompt communication of operations at NPP units. Training workshops held for NPPs were

devoted to the subject of the enterprises' activities promoting in social networks with involvement of external SMM management experts.

Among the plans for 2019 are further activities at the level of the Company, branches and subsidiaries, arrangement of the corporate contest among NPPs for the best public in social networks.

Changes in Number of Rosenergoatom Followers in Social Networks over 2016-2018



Special Projects for Relations with General Public and Authorities

Among the prioritized areas are the educational and enlightenment work among population and communities. Exhibitions located in Community Information Centers of NPPs receive from 3 to 5 thousand visitors each year.

Stakeholders Commission

The Stakeholder Commission has been operational in the Company since 2013. The Commission helps streamline the public reporting system and ensures public acceptance of the Company's activities through a pro-active dialog with stakeholders.

In 2018, the Commission members actively participated in discussing the current issues of the Company's development, including the dialogs and public consultations related to public reporting, and other measures for the community, including the International Forum ATOMEXPO 2018 in Sochi.

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Interaction as This Annual Report Was Prepared

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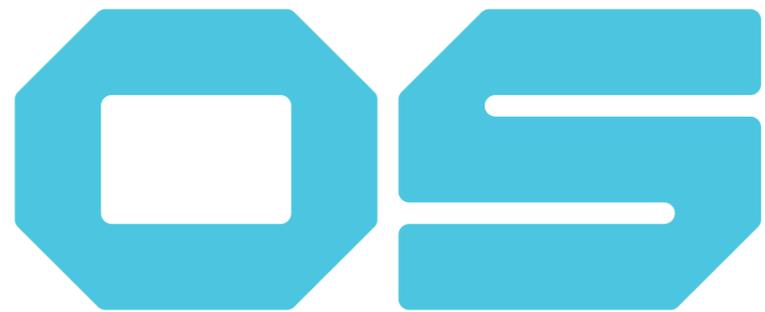
In view of the nature of the Company's activity, the Safe Operation of NPPs and the Corporate Digitalization Program were selected as the priority issues of the Annual Report in 2018. Representatives of key stakeholders of the Company actively participated in dialogs discussing the overall concept, priority issues and the draft of the Annual Report, as well as participated in public affirmation of the Report.

Oblast). The Dialog was devoted to Discussing Prioritized Subjects of 2018 Annual Report. The participants visited the Kalinin NPP and the Kalinin Data Processing Center, asked their questions about disclosure in the annual report of the information related to the results of 2018 and measures ensuring safety of Russian NPPs, and key projects of digital transformation.

Dialog No. 1 was held in November 2018 in the form stakeholders questioning. The Dialog was devoted to Discussing Concept of 2018 Annual Report of Rosenergoatom. The dialog participants received the draft concept of the Company's Annual Report, with comments and suggestions received.

Public consultations regarding the draft 2018 Annual Report were held on April 25, 2019 at VNIIAES (Rosenergoatom subsidiary, Moscow) and were attended by a broad range of stakeholders. The draft Annual Report was presented, feedback and comments were received from stakeholders¹, and an excursion was held to the Virtual NPP.

Dialog No. 2 was held on February 22, 2019 in the form of a visiting meeting at the Kalinin NPP (Udomlya, Tver



Ensuring Efficient Operations

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The Company's corporate governance system is built according to the requirements of the Russian laws, and aimed at ensuring the management efficiency, observing the information transparency and general availability principles, and executing the rights of stockholders and other stakeholders.

102-30
102-33 **5.1. Corporate Governance**

The Company has not approved the Corporate Governance Code. Rosenergoatom applies certain standards of the Corporate Governance Code recommended by letter No. 06-52/2463 dated April 10, 2014 of the Bank of Russia to its daily practice taking into account the specifics of the legal status of Rosatom State Corporation set forth in regulations of the Russian Federation, which provide for unified management of organizations operating in the nuclear power industry. The standards of the Corporate Governance Code are reflected in a number of local regulations providing the stockholder with all possibilities to participate in the corporate governance and familiarization with the information related to the Company's activities.

Among the key documents regulating observance of the Company's stockholders are:

- Rosenergoatom Articles of Association¹;
- Regulation on Rosenergoatom General Meeting of Stockholders²;
- Regulation on Rosenergoatom Board of Directors³.

The Company's internal documents are available at:

rosenergoatom.ru/partners/shareholdersAndInvestors/inner-documents/

The Company's corporate governance system is built according to the requirements of the Russian laws, and aimed at ensuring the management efficiency, observing the information transparency and general availability principles, and executing the rights of stockholders and other stakeholders. The Company sticks to the core principles of corporate governance recommended by the Corporate Governance Code (approved by the Board of Directors of the Bank of Russia on March 21, 2014)⁴.

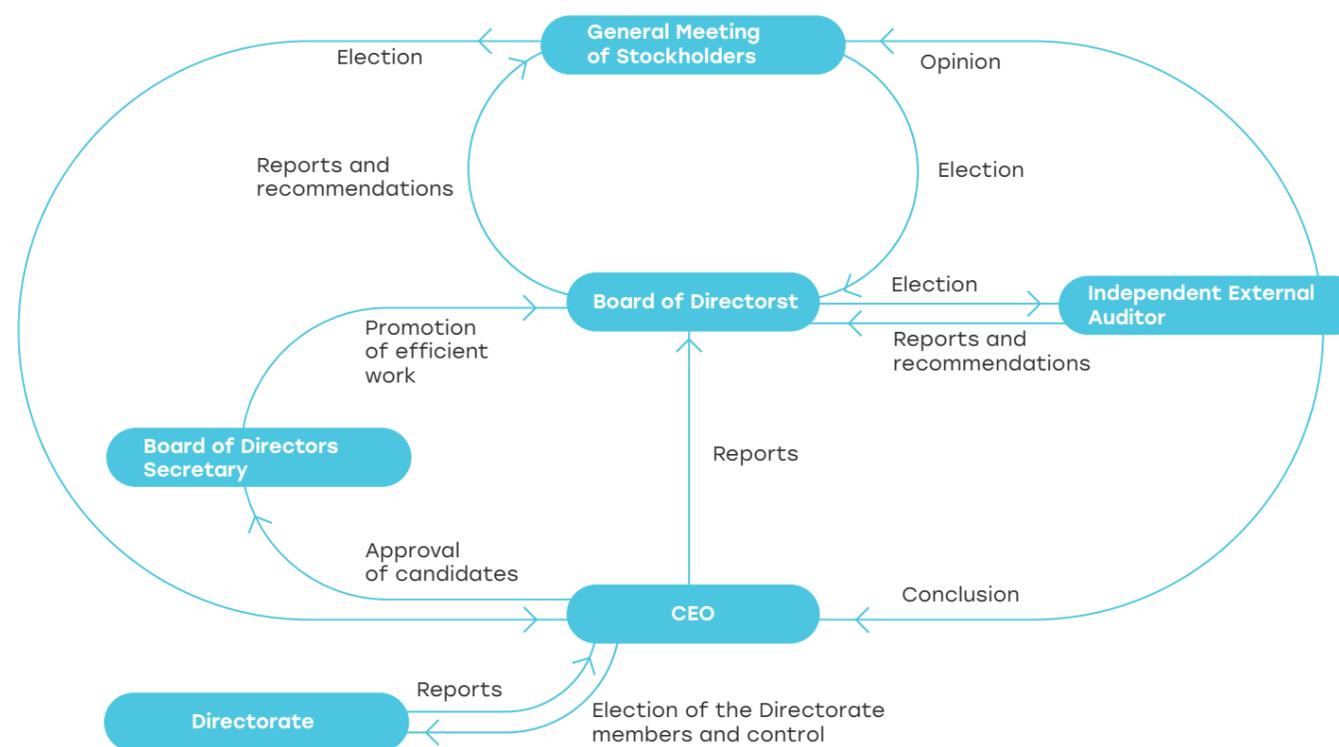
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² rosenergoatom.ru/upload/iblock/db5/db577f161550a196c0e10dd949319cf1.pdf
³ rosenergoatom.ru/upload/iblock/877/8775338f3cbccfaec0d87ff0ad2af61b.pdf
⁴ The information regarding compliance of Rosenergoatom with the principles and recommendations of the Corporate Governance Code approved by the Board of Directors of the Bank of Russia on March 21, 2014, are given in Appendix 19.

Governing Bodies Structure

The governing bodies are structured in accordance with the governance principles that apply in the parent company – Rosatom State Corporation, and predetermine the Company's functioning as the operator of the Power Engineering Division of Rosatom State Corporation, as well as industry-specific best practices.

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Governing Bodies Structure



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General Meeting of Stockholders

The General Meeting of Stockholders is the supreme management body. In its activity the General Meeting of Stockholders is guided by Russian Federation laws, the Articles of Association and the Regulation on Rosenergoatom General Meeting of Stockholders .

In 2018, the general meeting of stockholders considered the following matters:

- Distribution of profit (including dividends payment (announcement), excluding the dividends payment (announcement) for Q1, H1, 9 months of 2017) and losses of Rosenergoatom following the results of 2017.
- Election of the Company's Board of Directors members.

Board of Directors

The Board of Directors is a collegiate governing body in charge of overall management of the Company. It is responsible for development of the strategy, and controls activity of executive bodies ensuring observance of rights and legitimate interests of the Company's stockholders.

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Members of the Board of Directors are elected through a transparent procedure that permits stockholders to obtain information about candidates sufficient to get an idea about their personal and professional qualities.

The activity of the Board of Directors is regulated by applicable legislation

of the Russian Federation, standards of the Company's Articles of Association, and Regulations on the Board of Directors approved in its new revision by resolution of the General Meeting of Stockholders on January 9, 2017 (Minutes No. 20).

The Board of Directors composition remained unchanged throughout 2018. Independent directors were not elected to the Board of Directors. The Company's internal documents neither set the minimum number of independent members on the Board of Directors, nor the independence criteria.

Members of the Board of Directors do not participate in the Company's registered capital, do not hold the Company's common stock, and have

not entered into transactions on acquisition or alienation of the Company's stock.

The Company's Board of Directors has no committees.

Gender composition of the Board remained unchanged: 100% of the members are men. Such a composition is reasoned by the Company's industry-specific features and does not evidence gender inequality.

- 1 rosenergoatom.ru/upload/iblock/738/7385acd24646522f6e8bf95f885bce09.pdf
- 2 rosenergoatom.ru/upload/iblock/db5/db577f161550a196c0e10dd949319cf1.pdf
- 3 rosenergoatom.ru/upload/iblock/877/8775338f3cbccfaec0d87ff0ad2af61b.pdf

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On June 25, 2018, the Company's general meeting of stockholders approved the new composition of the Board of Director*



Alexander Markovich Lokshin

Chairman of the Board of Directors, Rosenergoatom (since 2010); First Deputy CEO for Operations Management, Rosatom State Corporation, Non-Executive Director

Sergey Anatolyevich Adamchik

Member of the Board of Directors, Rosenergoatom (since 2010), Chief Inspector, Rosatom State Corporation, Non-Executive Director

Oleg Stanislavovich Barabanov

Member of the Board of Directors, Rosenergoatom (since 2016), First Deputy CEO, Atomredmetzoloto, Non-Executive Director

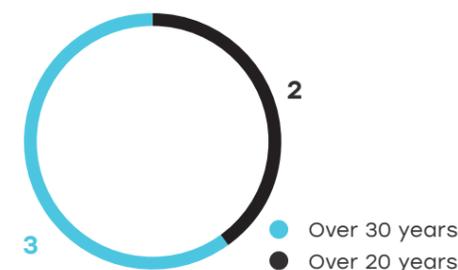
Andrey Yuvenalyevich Petrov

Member of the Board of Directors, Rosenergoatom (since 2016); CEO, Rosenergoatom, Directorate Head, Executive Director

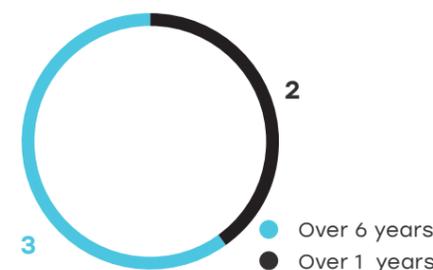
Boris Georgievich Silin

Member of the Board of Directors, Rosenergoatom (since 2010); Advisor to First Deputy CEO for Operations Management, Rosatom State Corporation, Non-Executive Director

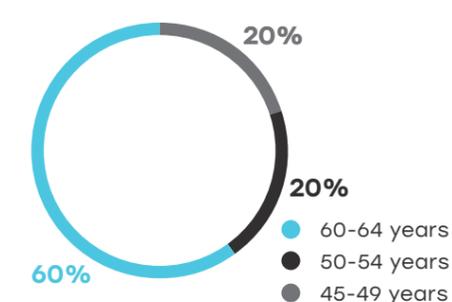
Job Experience of Board Members in Nuclear Industry (As of December 31, 2018)



Age Structure of Board of Directors (As of December 31, 2018)

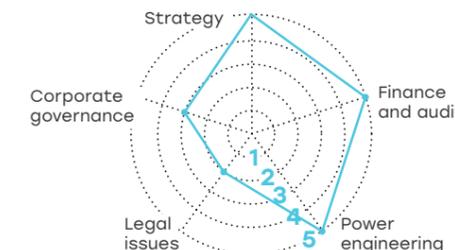


Duration of Members' Work on Board of Directors (As of December 31, 2018)



Key Professional Competences of Board Members*

● Number of the Board members having respective competence



* Key competences are shaped on the basis of the data regarding the education and experience of the Board members, including the analysis of jobs and specific features of the organizations, and they are not a full list of competencies featured by the Board members.

* CVs of the Company's Board of Directors members are provided in Appendix 17.

Board of Directors Chairman

The Chairman of the Board of Directors organizes the activity of the Board and performs other functions stipulated by the Regulation on Board of Directors. The Board members elect the Board of Directors Chairman from among themselves by a majority of votes. The Company's CEO can not be the Board of Directors Chairman.

Alexander Markovich Lokshin¹ was Chairman of the Board of Directors in the reporting period.

The Board of Directors held 84 meetings and considered 90 matters in 2018. The Board of Directors meetings attendance by the Board members was equal to 100%.

Report on Activities of Board of Directors

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One of the most important functions of the Board of Directors is general governance of the Company.

The area of competence of the Company's Board of Directors includes determination of priority lines of business (in accordance with the Federal Law No. 208-FZ dated December 26, 1995 on Joint-Stock Companies and the Company's Articles of Association).

In 2018, as a part of its current activity, the Board of Directors determined the main parameters of business in the approved budget, planned indicators of financial and economic activity, and target performance indicators of the Company's activity for 2018, main reference points for activity in the long-term, and approved key performance indicators.

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Performance of the Board of Directors was not evaluated in 2018.

Number of Issues Tackled by Board of Directors



¹ The CV of Alexander Lokshin, Chairman of the Company's Board of Directors is provided in Appendix 11.

CEO

The CEO is a sole executive body, **Andrey Yuvenalyevich Petrov**² was elected CEO of Rosenergoatom on October 7, 2015.

Directorate

Directorate is an advisory collegiate body of Rosenergoatom, headed by CEO. The Directorate activities are governed by the Russian Federation laws, the Company's Articles of Association, organizational and administrative documents as related to the Directorate activities, and the Regulation on Directorate. The Directorate competence includes consideration of the issues related to performance of target benchmarks of the Company's activities.

Five meeting of the Directorate in praesentia were held in 2018. Two meetings considered the Company's main production objectives, key events and target benchmarks, existing power units operation safety issues, strategic development and new power units construction, preparation and arrangement of the IAEA corporate OSART mission, and the issues of HR and social policy.

There were changes in the Directorate compositions in 2018³.

Most Important Resolutions by Board of Directors in 2018

- Strategic objectives were approved in relation to Rosenergoatom activities safety and the measures of their achievement
- In order to avoid the conflict of interests, an approval was granted to close 13 interested party transactions in accordance with the Company's Articles of Association
- In order to control the transactions with real estate, approval was granted by the Board of Directors to close 33 transactions
- Approval was granted for Rosenergoatom participation in Energoatominvest by means of making an additional contribution to the registered capital in the form of movable and immovable property at the market value of 294,416,453 rubles
- A transaction was approved for acquisition of additional stocks in Atomtechenergo for the amount of 8,340,000 rubles
- Approval was granted for Rosenergoatom participation in AtomTeploElectroSet by means of making an additional contribution to the registered capital in the amount of 449,468,646 rubles and 128,900,000 rubles
- A transaction was approved for acquisition of additional stocks in Atomtrans for the amount of 41.970.000 rubles
- Following the results of 2017, the annual report and annual accounting statements were approved, and recommendations were given on profit distribution and dividends payment

² The CV of Andrey Petrov, CEO of Rosenergoatom is provided in Appendix 11.

³ Information regarding the Directorate is provided in the Company's 2017 Annual Report in Section 4.1 – Corporate Governance: rosenergoatom.ru/shareholders/raskrytie-informatsii/godovye-otchetiy/

Aggregate Remuneration of Top Managers

591.4 mln rubles is the total remuneration paid in 2018 to key management personnel: executives (CEO and his Deputies) and other officers vested with authority and responsibility for planning, directing, and controlling activities of the Company.

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Remuneration of Governing Bodies Members

₽ 591.4 mln rubles is the total remuneration paid in 2018 to key management personnel

As regulated in Clause 14.12 of the Company's Articles of Association, if so decided by the General Meeting of Stockholders, members of the Company's Board of Directors, while in office, may be entitled to remuneration, and reimbursement of costs related to their functions as Board Members. The amounts of such remunerations shall be established by resolution of the General Meeting of Stockholders.

In 2015–2018 no remuneration was paid to the Company's Board Members.

The CEO remuneration is regulated by the employment contract, and payable after its amount approval by the Board of Directors. The variable part of remuneration depends on achieved key performance indicators (KPI). Key performance indicators are established for the Company as a whole, and included in the indicator matrix of the CEO, and subsequently broken down and transferred to managers at all levels.

₽ 793,122,539,874 common stocks with a nominal value of one (1) ruble each

Equity Capital¹

No amendments were made to the Company's Articles of Association in 2018 regarding the increase of the registered capital. As of December 31, 2018, the Company's registered capital totaled 793,122,539,874 rubles. The registered capital is divided into 793,122,539,874 common stocks with a nominal value of one (1) ruble each.

As of December 31, 2018, the number of circulating stock totaled 1,043,122,539,874 pieces, including:

- 815,841,558,874 placed (paid up) stocks comprising the Company's registered capital, including 793,122,539,874 authorized capital stocks registered with the Federal Tax Service, and 22,719,019,000 stocks placed (paid up) in 2017 in favor of Rosatom State Corporation

in line with the resolution on the Company's additional stock issue dated December 29, 2016.

- 213,675,136,200 stocks issued (unpaid) as part of the Company's additional stock issue in line with the resolution on the Company's additional stock issue dated December 29, 2016.

The resolution on additional stock issue was approved by the Board of Directors (Minutes No. 285 dated December 7, 2016), and registered with the Bank of Russia on December 30, 2016 under state registration number 1-01-55417-E-007D. The number of additionally issued stocks is 250,000,000,000 with a nominal value of 1 ruble, totaling 250,000,000,000 rubles. The additionally issued stock shall be placed no later than September 3, 2019.

Information about Major Transactions and Interested Party Transactions

In 2018, the Company did not make major transactions requiring approval by the authorized governing body of a joint-stock company in line with the Federal Law on Joint-Stock Companies.

In accordance with Article 3.10 of the Company's Articles of Association, provisions of Chapter 11 of the Federal Law on Joint-Stock Companies are not applicable.

Article 14.2.35 of the Company's Articles of Association defines the conditions that differ from the Federal Law on

Joint-Stock Companies related to approval of interested party transactions.

In order to avoid the conflict of interests, an approval was granted by the Board of Directors to close 13 interested party transactions in 2018 in accordance with the Company's Articles of Association.

¹ Information regarding the Company's stockholders is provided in Section 1.1 – General Information.



Report on Dividends Paid

The Company's General Meeting of Stockholders dated June 25, 2018 (Minutes No. 26) approved the resolution to omit declaring and paying out dividends on the Company's common stock following the results of 2017, and no decision was made to pay out dividends following the results of the first quarter, the first half and 9 months of the reporting year.

The basic principles of dividends calculation, the procedure of making

decisions on the Company's payout (announcement) timeframes are defined by the unified industry-level guidelines (UILG) for distribution of net profit of business entities of Rosatom State Corporation and Atomenergoprom, which were approved and enacted by the Company's order No. 9/437-P dated April 13, 2018 and developed in accordance with the applicable Russian Federation laws and local regulatory acts of Rosatom State Corporation and Atomenergoprom.

Basic Principles and Priority of Net Profit Distribution

The principle of supporting business activities of the Company and the Corporation

A part of the Company's net profit in the reporting period is channeled for financial and business activities of the Company and the Corporation, as well as the industry development measures implementation

The principle of balancing the funding sources of the subsidiaries' investment activities

A part of a subsidiary's net profit in the reporting period is channeled for funding of the subsidiary's projects portfolio, including implementation of the projects co-funded from the federal budget, the diversification projects, other government-set objectives

The principle of combining the management interests of subsidiaries and the Corporation/Company/

The results of management activities of subsidiaries in case of a positive economic effect in the reporting period are taken into consideration upon distribution of the subsidiary's net profit

Priorities of the subsidiaries' net profit channeling

Priorities in shaping the provisions are stipulated by the Russian Federation laws and the subsidiary's articles of association, investment activities; keeping of a part of the subsidiary's net profit at the disposal of the subsidiary in case of a positive effect of the activities efficiency improvement (undistributed profit); payment (announcement) of dividends for the purpose of maintaining financial and economic activities of the Company and the Corporation in implementing the industry development measures

Transparency principle

A transparent and predictable way of the dividends calculation

Corporate Governance System Improvement Measures in 2018

Introduction of Electronic Voting System at General Meetings of Stockholders

As a part of Rosatom State Corporation pilot project for introduction of an electronic voting system at general meetings of stockholders in industry-level organizations, Rosenergoatom being a stockholder of the Power Engineering Division organizations initiated the launch of the Electronic Voting System at the general meetings of stockholders of CONCERN TITAN-2 at the website of R.O.S.T. Registrar. A new revision of the articles of association of the Division organization was approved in order to provide such possibility, the respective power of attorneys for the Company's representatives were prepared.

Electronic voting at the general meetings of stockholders provides a possibility of remotely participating in general meetings without the use of services of nominal holders or authorized representatives, viewing the meeting videoconferences, saving time and travel costs, observing the Corporate Governance Code recommendations.

Stockholders gain access to a personal cabinet in any place of the world, which allows familiarizing with the meeting materials, receiving notices of the beginning of voting, registration and other stages of the meeting, remotely tracing the process of the meeting, avoiding mistakes in filling up the voting forms owing to automated checkup, receiving relevant information on the voting form status and ordering its soft copy certified by a qualified electronic signature of the Registrar's authorized representative.

In 2018, with a view to prevent violations and improve the processes of corporate approval of transactions, a review of the Company's branches was performed to check their compliance with the procedures of transactions requiring approval by the Board of Directors, including the interested party transactions of the Company's employees authorized for making any transactions on behalf of the Company.



Creating Industry-Level Center of Competencies for Digital Transformation of Nuclear Industry

Inter RAO Group, Rosatom State Corporation, Russian UES Operator and Rosseti will create an Association for Digital Development of Power Industry – Digital Energy. The Association will become an industry-level center of competencies for digital transformation of the industry. The respective decision was approved at the meeting chaired by Alexey Texler, First Deputy of the Russian Federation Energy Minister. The Digital Energy Association is created with a view to unite the efforts of government authorities and the industry-level business community, scientific research and educational organizations of the power industry, as well as other participants of the digital transformation in order to shape a consolidated position in digital development of the industry. In addition, it is assumed that laboratories are created as part of the Association for studying and approbation of new digital technologies, equipment and software, complex and platform-based solutions for the power industry digitalization projects, and further commissioning in Russia and abroad. The Company acts as one of the founding members of the Association.



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5.2. Risk Management

The Company's Risk Management System (RMS) functions at all levels of management and is involved in all processes in a natural way with a view to support implementation of long-term and mid-term plans and achievement of the strategic targets of activities.

Actively supported by top management, the RMS is developed and up-scaled ensuring timely detection, evaluation and efficient management of risks in all areas of the Company's activities. Operation of the Company's RMS is carried out in line with the Regulation on Power Engineering Division Risk Management System of Rosatom State Corporation and meets all legal and industry-specific requirements and rules.

Due to specifics of activity, the Company as the operating organization pays utmost attention to the risks of nuclear, radiation, technical and fire safety, and physical protection of NPPs. Therefore, all issues related to current operation and further development of the RMS are tackled with due regard to mandatory observation of all applicable standards for all kinds of safety, the requirements of the safety management system being an integral part of the Company's general governance system.

Risks of Strategy Implementation. Top management pays utmost attention to monitoring of such risks. The monitoring is performed on a regular basis and includes the quantitative assessment of deviations and the analysis of reasons and key influencing factors. According to the available estimates, the strategy implementation risks remained quite low 2018 as in the previous periods. Meanwhile, key strategic indicators, including production, financial and economic ones were achieved, strategic

plans and measures were accomplished in 2018.

Climate risks are also considered as important due to possible influence on the Company's production activities and resulting financial indicators.

Adverse climate conditions for NPPs operation are quite rare, however, they are observed in some areas of presence.

These risks are primarily managed when selecting the NPP construction site and during construction operations through the design solutions that have been approved several times and proven in various climate conditions allowing for uninterrupted and failsafe operation of NPP units in a broad range of possible adverse natural factors and impacts. Secondly, organizational and administrative measures are used to compile schedules of repair campaigns in summer months potentially most unfavorable for NPPs operation as regards to temperature modes. Thirdly, a lot of measures implemented in 2018 and previous years with a view to ensure safe operation of power plants simultaneously guarantee protection from various man-made, technogenic and natural factors, thus reducing the probability and mitigating potential consequences of climate risks.

It is fair to say that despite quite a low controllability of potential abnormal natural impacts, the measures taken to limit their impact in the reporting year demonstrated efficiency and sufficiency. Being committed to the UN Sustainable Development Goals, the Company pays special attention to climate change risks. Production of heat and power by NPPs does not make any adverse impact on the environment in the NPP location areas and subse-

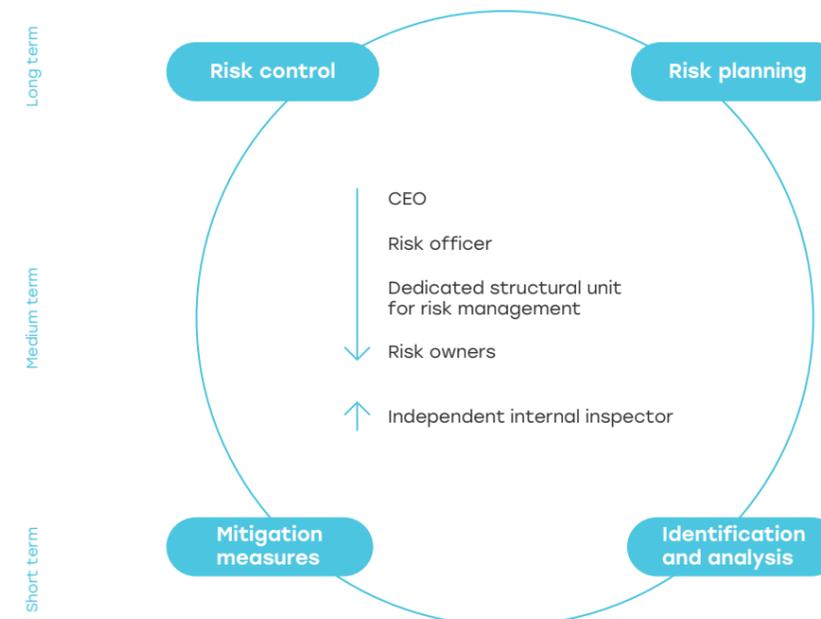
quently does not lead to temperature and other climate changes. Meanwhile, the nuclear generation is one of the few ways of power production that does not lead to CO and CO₂ emissions, thus ensuring preservation of the natural environmental balance.

All measures taken by the Company (development of the NPP fleet, upgrading, service life extension, etc.) enable further development of nuclear generation, minimize the adverse man-made impact on the environment, preserve the globe for future generations.

The risks associated with climate change did not affect the Company's activities in 2018, as in the previous years, and they are therefore not among the key risks for the Company. In addition to thorough monitoring, this risk is primarily managed through development and improvement of the risk management procedures in all of the Company's processes at present.

The Company continues paying this class of risks utmost attention and anticipates an adequate reaction to any adverse climate factors.

System of Risk Management Competence Distribution among Management and Control Bodies



Basic Principles of Risk Management System

- Mandatory accounting for the necessity of compliance with the applicable standards of all kinds of safety, and ensuring of uninterrupted functioning and streamlining of the safety management system being an integral part of the overall management system of Rosenergoatom.
- Inclusion of risk management procedures (including identification and assessment) into all major processes of production, financial, organizational planning (strategic planning, business planning, investment planning, budgeting)
- Comprehensive assessment of risks is carried out with consideration of mutual influence of all risks emerging in various fields of the Company's activities.

Major Results of 2018 and Prospects for 2019

Similarly, to the previous years, insurance is one of the management methods for certain types of risks and it is successfully applied in practice.

In 2018, as in the recent years, the Company did not admit implementation of any significant risks with negative consequences.

In 2018, large-scale efforts were taken to develop and improve the RMS in the Company and its comprehensive integration with all major processes of the operating company.

All regulatory and guiding documents were updated on schedule. Annual assessment of risks was carried out, along with evaluation of cumulative influence on major production, financial and economic indicators. Scheduled tracking of the risk management measures was performed.

Work continued to include the risk management procedures into every process, align their application mechanisms, perform in-depth analysis of obtained results, further steps were scheduled and plans were developed for 2019, as well for further improvement of operating efficiency of risks management in every sector and in each specific process.

Key Risks Structure

- Safety risks
- Coordination and development planning risks
- External environment risks
- Operational risks
- Supporting processes related risks

1.4 bln kWh
increase in the power output of NPPs in 2018 versus 2017

Information on Key Risks Management by Rosenergoatom

The risk of reduction in generation volumes due to equipment downtime or its unpreparedness for loads

The main factor of increasing the power output of NPPs in 2018 versus 2017 (1.4 bln kWh deviation) was the commissioning of new power units (Rostov NPP unit No. 4, Novovoronezh NPP-2 unit No. 1, Leningrad NPP-2 unit No. 1).

The main risk factors of lower power output are upsets and failures in equipment operation leading to unscheduled load reliefs, stops and unscheduled repairs due to technical conditions of a power unit. All cases of upsets and failures in equipment operation are investigated pursuant to the established procedure. The investigation results are used to develop corrective and preventive measures aimed at eliminating root causes of violations and preventing their repetition, including development of industry-specific corrective measures for prevention of such violations at other NPPs.

Risk of Changes in Prices for NPP Generated Electricity and Capacity

In 2018, among the key influencing factors, as in the previous years, were: the amount power consumption in the first pricing zone, natural gas price indexation (primary fuel for heat generation in the first pricing zone), competition among generating companies.

The influence of the said factors on electricity and capacity prices did not considerably change in 2018 if compared to 2017.

The Company's Power Supply Service takes measures to agree repair timeframes for network equipment with FGC UES and SO UES. As a result of negotiations, in individual cases it is possible to shift the repair timeframes for network equipment over to the period of NPP units repair, which reduces the risks of price reduction and the risks of NPP power output limitation. Meanwhile, it should be noted that despite the day-ahead market price reduction during the increase of the price-accepting supply by NPPs, on average the Company's revenues from electricity sales increases with an increase in the NPP output.

In general, the day-ahead market electricity and capacity price resulting from competitive capacity offtake is a factor beyond control, therefore in the absence of deregulated bilateral contracts the Company actively works on mitigation of the consequences of the above mentioned negative factors influence on the Company's activities during discussion and amendment of the WECM rules. One of the mitigation mechanisms for the risks related to volatility of deregulated electricity and capacity prices is the capacity price component stipulated by the WECM rules and aimed at funding safe operation of NPPs. The factors for day-ahead market price changes are not foreseen in the near future.

Thus, the electricity price is likely to remain at the present level in the medium term, with due regard to the natural gas price indexation. The capacity prices will grow in line with the competitive capacity offtake and annual indexation.



Risks That May Considerably Influence Rosenergoatom Goals Achievement

1. Risk of Decrease in Electricity and Capacity Production Volume



Risk factors:
Violations, equipment failures resulting in full or partial unloading of the power unit, and NPP unpreparedness to meet production commitments.

Risk level:
Risk level reduced. Introduction and application of the RPS for streamlining of production activities allowed for full elimination of the adverse factors impact in 2018.

Risk management:
All cases of upsets and failures in equipment operation were investigated pursuant to the established procedure. Corrective and preventive measures were developed. They are aimed at removal of the root causes of upsets and prevention of their repetition.



2. Opportunity Risk of Unfavorable/Favorable Changes in Market Prices



Risk factors:

- Price environment changes in the electricity and capacity market (due to reduced electricity consumption, emergence of more economically viable generation in the market, fluctuation of prices for fossil fuel)
- Full or partial absence of demand for potential capabilities of NPPs due to specific requirements of the system operator for the energy system operation mode.

Risk level:
The risk level is moderate, the risk was partially observed as the system operator limitations in 2018.

Risk management:
The risk depends exclusively on external factors. Risk hedging with the use of financial instruments does not seem possible due to low market liquidity. For the purpose of risk reduction, energy distribution service providers are taking efforts to agree repair times for network equipment with FGC UES and SO EUS.



Risk of Counterparty's Failure to Timely Discharge Its Obligations in Full

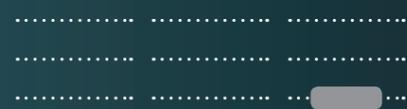


Risk factors:
Deterioration of financial and economic stability and payment discipline among counteragents

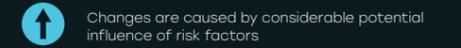
Risk level:
Moderate

Risk management:

- Reviewing claims related to WECM non-payers;
- Settling the debts of existing WECM players in an out-of-court manner;
- Returning a portion of WECM receivables in accordance with the results of tenders organized by the Russian Federation Energy Ministry to replace the suppliers of last resort;
- Applying the system of financial guarantees on the wholesale market.



4. Risk of Growing Costs and Extending Terms of NPPs Construction in Russia

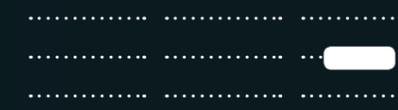


Risk factors:

- Violation of obligations by sub-contractors in relation to work schedules and quality
- Violation of obligations by suppliers in relation to the equipment supplies schedule and quality.

Risk level:
The risk level was high throughout 2018 due to high probability of construction time and cost impacts on the Company's financial indicators

Risk management:
For the purpose of risk management, the system of management is under improvement for all stages of NPPs construction, starting from pre-design preparations and ending with power unit commissioning. Requirements for organization of the assembly and construction work monitoring system were developed and introduced at NPP construction sites. The requirements ensure a unified procedure at all sites for collection and analysis of data and information on assembly and construction work quality.



5. Opportunity Risk of Transformation to Digital Company



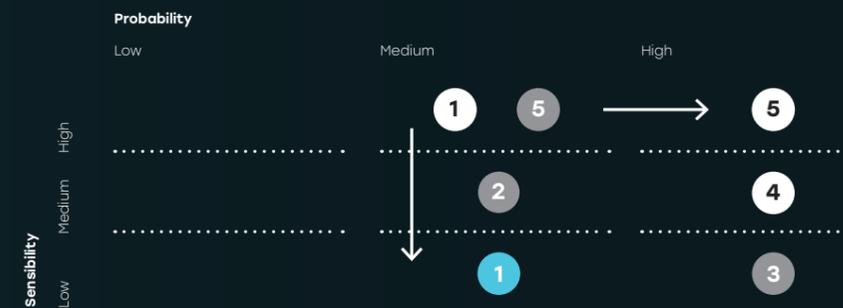
Risk factors:
Alteration of the Company's business models for strengthening the existing or creation of new competitive advantages through introduction of such technologies as cyber-physical devices, automation and robotization of production processes, internet of things, artificial intellect, big data processing, distributed ledger technologies

Risk level:
The growth in the opportunity risk in 2018 was caused by development of the digital energy and economy in Russia.

Risk management:
In addition to the Strategy for Development of Information Technologies in Power Engineering Division approved in 2017, the Digitalization Program of Power Engineering Division for 2018-2022 was approved. The Digitalization Program of Power Engineering Division for 2018-2022 defines the main digitalization areas for the organization, including the major development thrusts: digital energy, digital NPP, digital products



Considerable Risks Behavior Matrix



Risks Behavior in 2018:

- ↑ Increase
- ↓ Decrease
- ↑ ↓ No considerable changes

5.3. Internal Control and Auditing

The Company's internal control system is built on the basis of the Internal Control Policy of Rosatom State Corporation and Its Organizations, and it is an integral part of all processes of the integrated management system¹.

The Action Plan for Streamlining Internal Control and Operating NPPs and in Rosenergoatom Subsidiaries was updated in 2018. directors of subsidiaries assumed personal responsibility for efficient arrangement of the internal control system and its implementation.

The Company is implementing a control mechanism for stakeholders involved in purchasing activities through the

Arbitration Committees. Response time and decision delivery time were optimized, and the number of reasonable complaints filed with the Arbitration Committee was reduced in the reporting period due to increased quality of purchasing procedures.

¹ Detailed information regarding the principles and components of the internal control system is provided in Section 4.3 – Internal Control and Audit of the Company's 2017 Annual Report: rosenergoatom.ru/shareholders/raskrytie-informatsii/godovye-otchety/.

Specialized Internal Control Body

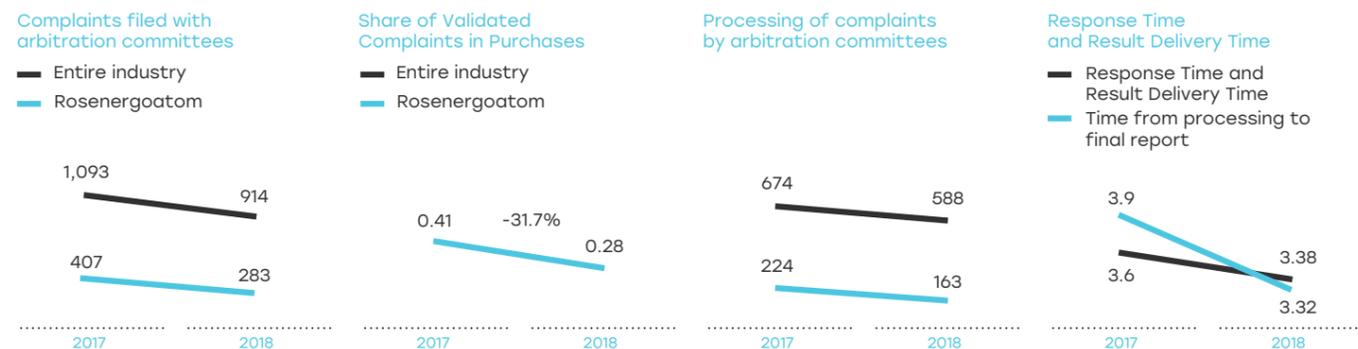
The Specialized Internal Control Body (SICB, 49 full time employees) was created in the Company in order to perform independent assessment of corporate governance, risks management and internal control.

The structural unit is headed by the Director for Internal Control and Audit – Inspector General, who is immediately subordinate to the Company's CEO. Functional management of the structural unit activities is performed by the director for internal control and audit – inspector general of Rosatom State Corporation.

Main Activity Areas of SICB

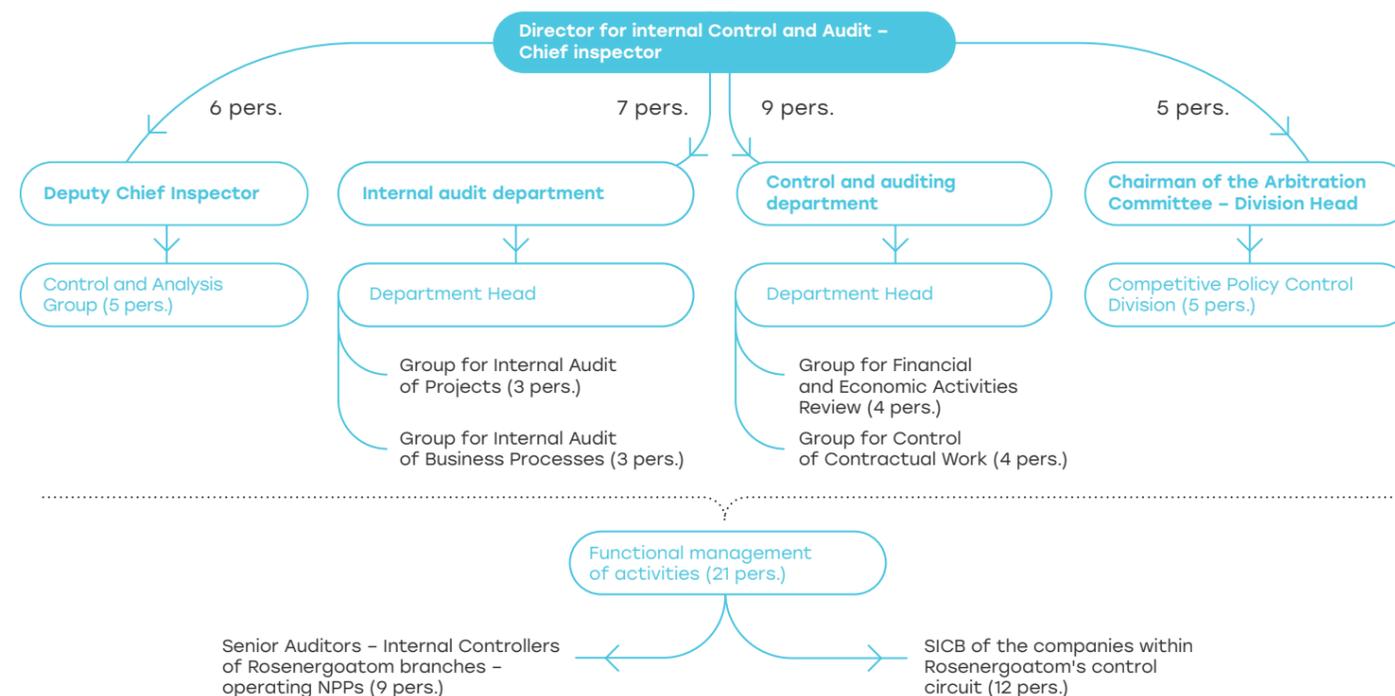
- Independent assessment of reliability and efficiency of the internal control system, corporate governance processes, risk management, financial and economic activity management processes.
- Internal consultations in relation to aspects of economic activity targeted at providing assistance and streamlining of the corporate governance processes, risk management and control processes.

Arbitration Committees Operating Mechanisms Optimization in 2018



Internal control and auditing in Rosenergoatom are integrated into the management system, and targeted at minimizing operational risks and enhancing reasonable attainability of the organization's strategic goals, while unconditionally observing the safety requirements, legal standards and international agreements.

Specialized internal control body of Rosenergoatom (49 pers.)



100%
The SICB Plan of Control Action was 100% completed in 2018

The SICB Plan of Control Action was 100% completed in 2018.

- 30 control measures were held (independent assessment);
- 728 corrective measures were developed and are implemented, out of them 427 are on the watch list.

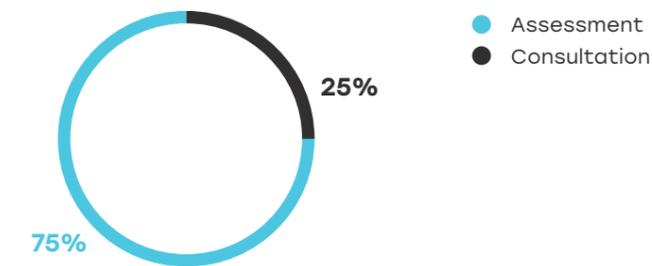
Safety Assurance and Improvement Program for Internal Control and Internal Audit Process

In 2018, the program was targeted at ensuring compliance of internal audit with the International Professional Practices Framework and it was 100% completed.

Distribution of Independent Assessment by Areas in 2018

		Assessment Examples
Processes related to capital expenses (CAPEX)	22%	Independent assessment of new power units construction under the Company's investment program was performed
Processes related to operating (current) expenses (OPEX)	78%	Independent assessment of NPPs decommissioning projects and expenses allocation to repair and operational needs was performed.

Structural Unit Worktime Distribution by Major Areas



Number of Planned and Implemented SICB Measures under Quality Assurance and Improvement Program in 2017-2018



A passport of the Internal Control and Internal Audit process of the integrated management system was developed and approved.

Among the innovations allowing for optimization of the Internal Control and Audit process was compilation of the Careful Internal Audit concept and approbation of the Individual Variation Flow tool of the RPS and possibilities of its replication, which considerably reduced the time between the identification of variations as part of control activities and the decision making (corrective measures) – up to 7 times.

Moreover, control activities efficiency was improved due to enhancement of the IT system supporting the SICB activities related to the reporting process follow-up monitoring, as well as mastering of the automated audit methods application skills with the use of SAP ERP.

The main areas of internal control and audit development for the long term are defined in the Concept for Internal Control Development in Rosatom State Corporation and Its Organizations, for the medium term – in the Quality Assurance and Improvement Program for Internal Control and Internal Audit Process of Rosenergoatom for 2019, which was developed with due consideration of the recommendations given by the Institute of Internal Auditors Association.

7,9 points
Professionalism of SICB employees was graded 7.9 out of 10

SICB Operations Compliance with International Professional Practices Framework for Internal Audit and Anticipations of Top Management as Evaluated by IIA Association

Specialized Internal Control Body

- ✓ Independent
- ✓ Fair
- ✓ Professional and constantly develops its professionalism
- ✓ Prudent
- ✓ Directly interacts with top management
- ✓ Constantly improves the internal audit quality

Meets the Ethics Standards and Code

- 95 standards

Satisfies expectations and needs of top management

- SICB role and functions are clearly understandable to the management
- Professionalism of SICB employees was graded 7.9 out of 10

External Audit

Every year, the Company performs external audit – assessment of reporting by an independent auditor. Financial and Accounting Advisors (FAA) was selected for accomplishment of mandatory auditing of the annual accounting (financial) statements in 2018.

₽ 16,626,200 rubles
The remuneration of the auditor

Selection of the external auditor was performed on the level of Rosatom State Corporation as part of general centralization of accounting and taxation processes, budget planning, internal control of financial reporting, and risk management. FAA auditors studied the annual financial statements prepared for 2018 in accordance with the RAS by several enterprises of

Rosatom State Corporation, including the Company. The remuneration of the auditor totaled 16,626,200 rubles (with VAT). Results of the audit are provided in the Auditor's Report (Appendix 15).

102-16	102-17	102-25
103-1	103-2	103-3
	205-1	205-2

5.4. Combating Corruption

The Company had developed and accepted the following documents as guidelines applicable to all of the Company's employees irrespective of their job positions:

- Unified Industry-Level Anti-Corruption Policy of Rosatom State Corporation and its Organizations. The Policy sets out the basic principles, guidelines and tools for combating corruption;
- Ethics Code defining the standards and rules of ethical conduct;
- Anti-Corruption Plan for 2018-2020 containing the list of prioritized

measures aimed at implementing the National Anti-Corruption Plan for 2018–2020;

- Unified Industry-Level Guidelines for Arrangement of Upskilling for the persons involved in combating corruption.

Guidelines were issued for regulation of the procedure of taking measures aimed at detection and elimination of causes and conditions for the conflicts of interest, reporting by employees of the cases of their induction to corruptive actions, notification of the facts of receiving gifts and business hospitality.

Data collection and its delivery to Rosatom State Corporation were arranged in relation to the property-related income and liabilities of the employees who take job positions associated with corruption risks, as well as their close relatives.

205-3

No anti-corruption offences leading to considerable violation of rights and legitimate interests of the Company and its organizations were detected in the reporting period.

Number of Employees Trained in Anti-Corruption Policies and Procedures

NPP/Program Name	Combating Corruption and Other Crimes in Industry-Level Organizations	Economic Safety, Assets Protection and Combating Corruption in Rosatom State Corporation
Kursk NPP	0	1
Leningrad NPP	0	1
Novovoronezh NPP	92	0
Rostov NPP	0	1
Smolensk NPP	0	1

Measures were taken to manage over 60 cases related to potential conflicts of interests, thus considerably reducing the risks of corruption and other crimes by the Company’s employees

Corruption risks were assessed resulting in approval of the following documents:

- List of business processes subject to highest probability of corruption offences and job positions subject to corruption risks;
- Corruption risks matrix;
- Register of the Company’s local regulations aimed at corruption risks elimination and minimization.

Moreover, the following aspects were updated in 2018:

- The list of the Company’s employees in charge for the coordination of anti-corruption activities and the measures preventing corruption and other crimes;
- The Unified Industry-Level Procedure for Hot Line Messages Processing in Rosatom State Corporation and Its Organizations,
- Regulation on Commission for Conflicts of Interest and Its Composition.

Sub-sections devoted to the issues of combating corruption on the official website and the internal information portal of the Company contain relevant information and materials related to this subject.

Following the results of the monitoring of compliance with anti-corruption legislation held in 2018, it was determined that:

- Local anti-corruption regulations issued by the Company complied with the requirements regulations and industry-level documents;
- All of the Company’s employees observed most of the requirements of anti-corruption standards and procedures.

No anti-corruption offences leading to considerable violation of rights and legitimate interests of the Company and its organizations were detected in the reporting period.

Out of 36 main business processes run by the Company, 15 (40%) were considered as most prone to corruption, 13 corruption risk owners were identified featuring potential corruption risks among top managers of the Company’s Headquarters (65% of the total number of top managers)

5.5. Property Management

Restructuring of non-core assets (through their sales) resulted in the income of 212 mln rubles in 2018.

- The Company owned 6,775 items of immovable property (buildings, structures, rooms, water transport facilities) with the balance (remaining) value of 496.9 bln rubles.

The Company implements the measures targeted at reducing the property management costs and tax expenses through the increase in the efficiency of the property use, detection and restructuring of non-core assets, reduction of the number of non-demanded facilities under construction.

Restructuring of non-core assets through their sale allows cost saving on their maintenance and tax payments, receiving revenues that may be channeled for development of production processes, creation of new businesses and jobs.

The Company performs a full cycle of property management from acceptance to retirement, including land plots.

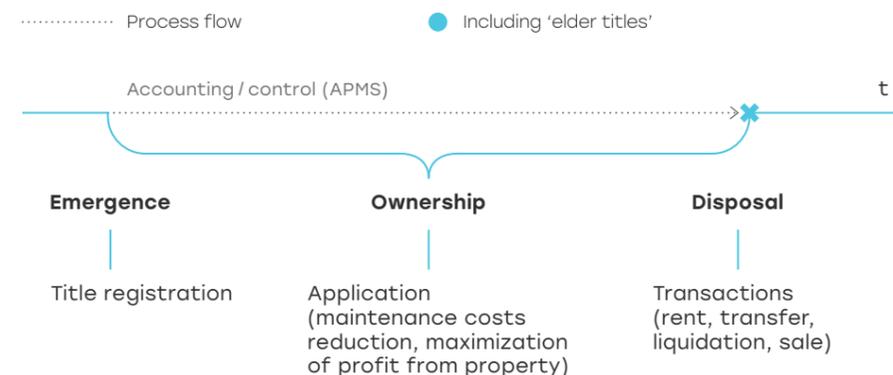
As of December 31, 2018:

- The Company performed the actual land use (as the owner / on the basis of other rights) of 719 land plots with the total area of 13,611 ha. The total cadastral value of the owned land plots exceeded 5.2 bln rubles, the Company’s land tax payments totaled some 78 mln rubles per year.

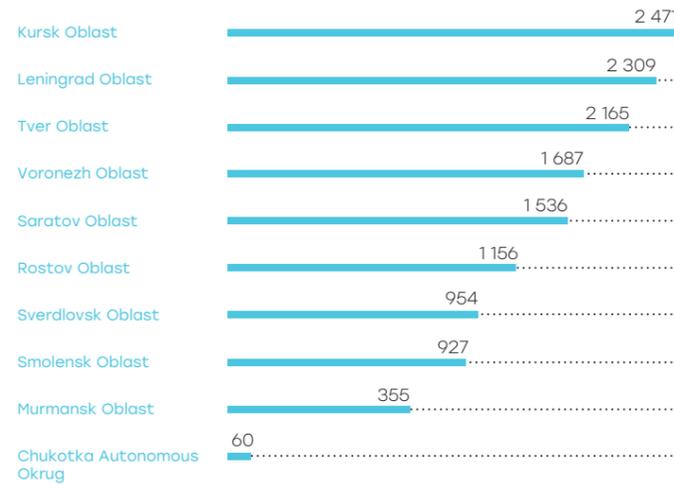
₹ 496.9 bln rubles

The Company owned 6,775 items of immovable property (buildings, structures, rooms, water transport facilities) with the balance (remaining) value of 496.9 bln rubles

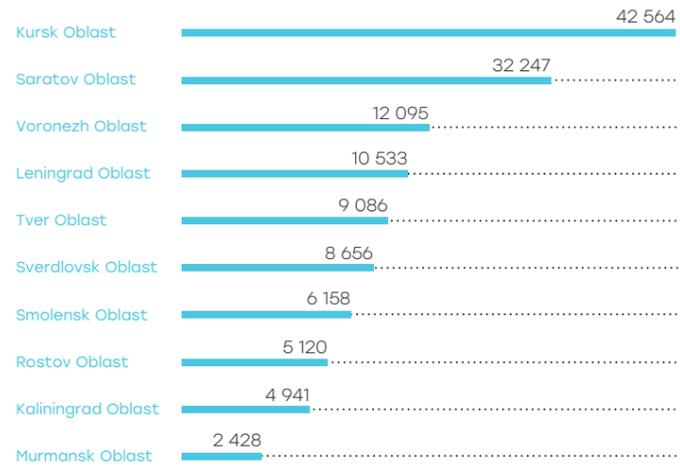
Property Management Cycle



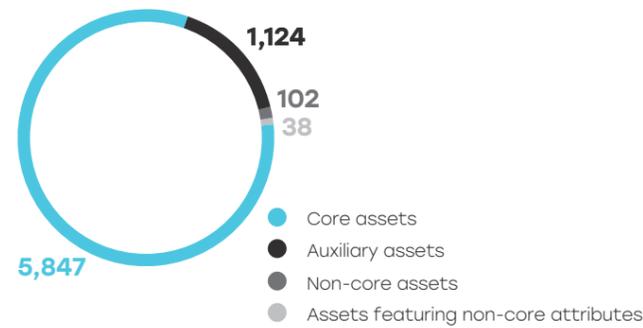
Top 10 Regions with Largest Area of Property (Thousand m²)



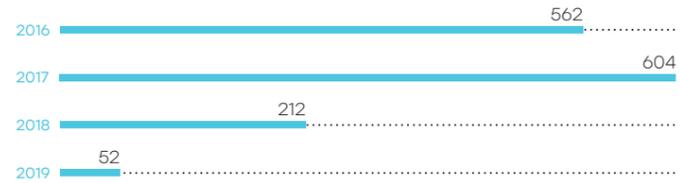
Top 10 Regions with Largest Area of Land Plots (Thousand m²)



Asset Structure, Pcs



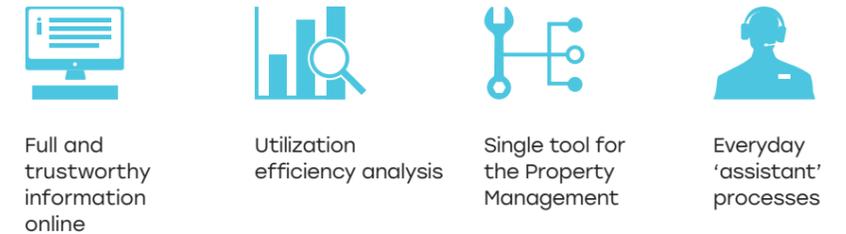
Cash Flow, Mln Rubles



*Beneficially owned property (buildings, structures, rooms, vessels, land plots) as of December 31, 2018.

Among the tools of efficient property management influencing the managerial decision making process speed is the Automated Property Management System (APMS) allowing to retrieve information regarding any property in an online mode irrespective of the property location.

Automated Property Management System (APMS)



103-1

103-2

103-3

5.6. Purchase Management

₽ **9,480**

Rosenergoatom and its branches held 9,480 purchasing procedures amounting to 445.7 bln rubles in 2018

₽ **6.1 bln rubles**

(8.5%) – savings as a result of competitive purchasing procedures

Being superior to any other requirements, safety assurance plays a key role in the purchases and procurement management system of the Company and nuclear power plants.

Procurement of goods, work, services for the Company's needs is carried out in compliance with the applicable regulations and requirements for ensuring secure and failsafe operation of nuclear plants and other nuclear facilities in the Russian Federation, including the IAEA reference documents.

Purchases are made with due regard to:

- The Company's specific legal status of the Operating Organization in line with the Russian Federation President Decree No. 1055 dated September 7, 1992 and Chapter 7 of the Federal Law No. 170-FZ dated November 21, 1995;
- A specific legal status of Rosatom State Corporation as the Authorized Management Body for Nuclear Energy Use entrusted to perform state management of nuclear energy on behalf of the Russian Federation

in accordance with Chapter 4 of the Federal Law No. 170-FZ dated November 21, 1995, the Federal Law No. 317-FZ dated December 1, 2007, as well as the regulations related to nuclear energy use.

The Company ensures supplies of the resources required and sufficient for performing the functions of an operating organization, and selects the organizations performing work and providing services for NPPs.

Regulatory Documents Governing Rosenergoatom Purchases

- 1 Federal Law No. 223-FZ dated July 18, 2011 on Purchasing of Products, Work, and Services by Specific Corporate Entities;
- 2 Federal Law No. 135-FZ dated July 26, 2006 on Protection of Competition defining the organizational and legal framework for protection of competition in the Russian Federation, including prevention and restraint of monopolistic activities and unfair competition;
- 3 Unified Industry-Level Purchasing Standard (Purchasing Regulation) of Rosatom State Corporation approved by the resolution of the supervisory board of Rosatom State Corporation No. 37 dated February 7, 2012 as amended (hereinafter – the Standard);
- 4 Unified industry-level procedure for planning, preparation to procurement processes, reporting at its expense for the needs of Rosatom and the State Corporation's organizations, including typical forms of the terms of reference (Order of Rosatom State Corporation No. 1/284-P dated March 30, 2015, Rosenergoatom Order No. 9/304-P dated March 17, 2016 as amended by Rosenergoatom Order No. 9/661-P dated June 4, 2018);
- 5 Other federal- and industry-level statutory acts, regulations of Rosatom State Corporation and the Company as related to purchases, procurement, quality and adjacent areas.

Procurement and Purchases Management Process Passport



₽

1,334

category strategies of purchases of materials, resources, equipment, work and services amounting to 37.1 bln rubles were approved

₽

2.76 bln rubles

(16%) – savings as a result of purchasing strategies implementation

₽

71%

is the cumulative annual value of the contracts made by the Company with small and medium size businesses¹ in 2018.

The Procurement and Purchases Management process passport was approved and enacted as part of the Company's Integrated Management System (IMS).

Measures are taken in the following areas in order to cut down the production prime cost and the processes duration:

- Reduction of processes duration as part of the industry-level Purchasing Activities Management function;
- Decrease in expenses for the function due to automation and standardization of processes;
- Ranging, unification and standardization of purchases;
- Reduction of prime cost in core business areas.

Information on goods, work, services to be purchased is published in the unified information system: www.zakupki.gov.ru, and on the official website for purchasing in the nuclear sector: www.zakupki.rosatom.ru; thus a wide range of bidders may join the purchasing procedures, and a competitive environment is created.

204-1

86% was the share of the contracting agents from the local suppliers as a result of purchasing procedures in 2018, where local suppliers are suppliers of goods, work and services located in the location areas of the Company and its branches

¹ Pursuant to the Government Resolution No. 1352 dated December 11, 2017 on peculiarities of small and medium businesses participation in purchases of goods, work, services by specific types of legal entities.

Performance and Efficiency Indicators in Procurement and Purchases Management Process Passport

- Meeting the customers' demand for ordered materials, resources, equipment, work and services (meeting the customers' demand in a timely manner) – the Company's safety assurance indicator
- Timeframes for preparation, approval and execution of the annual purchases plan (timeliness of planning and execution)
- Timeliness of purchasing procedures execution
- Level of raw materials and feedstock inventory (reduction in surplus/non-demanded inventory)
- Accomplishment of the reporting year milestones
- Performance of corrective and preventive measures developed on the basis of the audits and analysis of the process with discussion of safety and quality issues in the reporting period



5.7. Quality Assurance

Quality Policy Implementation

Quality Policy

The Company's quality system, being a basic sub-system of the integrated management system, hinges on the ISO 9000 series standards, federal standards and rules NP-090-11 – Requirements for Quality Assurance Programs for Nuclear Facilities, the IAEA General Safety Rules (GSR) Part 2 – Leadership and Management for Safety.

At all life cycle stages of the nuclear industry facilities the Company defines its quality assurance policy on the basis of the main goals of its activity – cost-efficient generation and reliably supply of electricity and heat to consumers while assuring the safety priority.

All activities regarding the Company's quality system development scheduled for 2018 by administrative orders of Rosenergoatom were performed in full.

The following measures were taken for development of the integrated management system (IMS):

- The IAEA corporate OSART mission for Corporate Governance review was successfully passed. The IAEA experts confirmed availability of the IMS in the Company and its compliance with the requirements of GSR Part 2 – Leadership and Management for Safety. General Safety Requirements;
- The Company's regulatory documents and standards were developed, updated and enacted to develop the quality system in accordance with GOST R ISO 9001-2015 requirements, ensure the quality of products supplied to the NPPs;
- The schedule and program of internal audits in the Headquarters and branches of the Company were completed in relation to compliance with GOST R ISO 9001-2015, NP-090-11, and the IAEA General Safety Requirements (GSR Part 2);
- Jointly with the Company's Inspectorate, a comprehensive internal review (audit) of the purchases and procurement management system was checked in structural units;
- The Statement of Quality Assurance Policy was updated taking into account of the IMS operational in the Company and development of new areas;
- A single process model of the IMS was introduced, process passports were developed;
- A list of the IMS processes was approved, a typical list of process was compiled for NPPs;
- A system for the operating efficiency monitoring was introduced for the purposes of safety with the use of ARIS software;



- Centralized training of the Novovoronezh, Kola, Rostov and Bilibino NPPs employees in the QMS buildup and documentation was completed, as well as internal auditing of the QMS was performed on the basis of ISO 9001:2015 (GOST R ISO 9001-2015).
- Preliminary external audits of the quality assurance system were performed for checkup of its compliance with GOST R ISO 9001-2015 by TÜV Rheinland's certification body in the Company's Technology Branch Office and at the Novovoronezh, Kola, Rostov NPPs as part of review of the Company's quality assurance system compliance with the requirements of ISO 9001:2015 (GOST R ISO 9001-2015).
- The area of the Company's certification for compliance with ISO 9001:2015 (GOST R ISO 9001-2015) was expanded in relation to production management and electricity supplies.

In the area of checkup of equipment acceptance control timeframes: the functional KPI of Rosatom State Corporation – Observation of Acceptance Control Timeframes at NPP Construction Sites – was 94.3% achieved (with the target value of 90%).

In the area of checkups of compliance with regulatory documentation requirements:

- In accordance with the Schedule and Program for NPP Reviews, the Beloyarsk, Bilibino, Smolensk, Leningrad and Kursk NPPs were reviewed for compliance with the requirements of NP-090-11, GOST R ISO 9001-2015, GSR Part 2 for organization of equipment

acceptance control at the Company's NPPs

- 16 quality assurance inspections of equipment manufacturing plants were held;
- Two audits of data integrity were held (as part of purchasing procedures).
- 16 production facilities of equipment manufacturing enterprises supplying equipment to the Company's NPPs were certified (including 4 production facilities – expanding the range of certified products).

In the area of national standards development:

- Draft standards GOST R – Assessment of Products Compliance through Testing. Procedure of Arrangement; GOST R – Development and Commencement of Production of Reactor Cores and Their Spare Parts. Assessment of Compliance in Form of Testing. Procedure of Arrangement were developed in 2018 and passed public hearings.
- GOST R 50.06.01-2017 – Assessment of Products Compliance in Form of Acceptance Testing. Procedure of Arrangement, GOST R 50.07.01-2017 – Assessment of Compliance in Form of Resolution of Imported Products Application at Nuclear Energy Facilities. Procedure of Decision Making were included into the federal standards and rules related to nuclear energy use – NP-071-18 (registered by the Ministry of Justice, enacted on March 18, 2018), which makes them binding. Inclusion into the Unified List of Standardization Documents is not required for the standardization documents included in the list of the Russian Federation laws and regulations.

