

**75 YEARS  
OF NUCLEAR  
INDUSTRY**

AHEAD  
OF THE TIMES



**PERFORMANCE  
OF THE ENGINEERING  
DIVISION  
IN 2019**



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ASE

ROSATOM

# PERFORMANCE OF THE ENGINEERING DIVISION IN 2019

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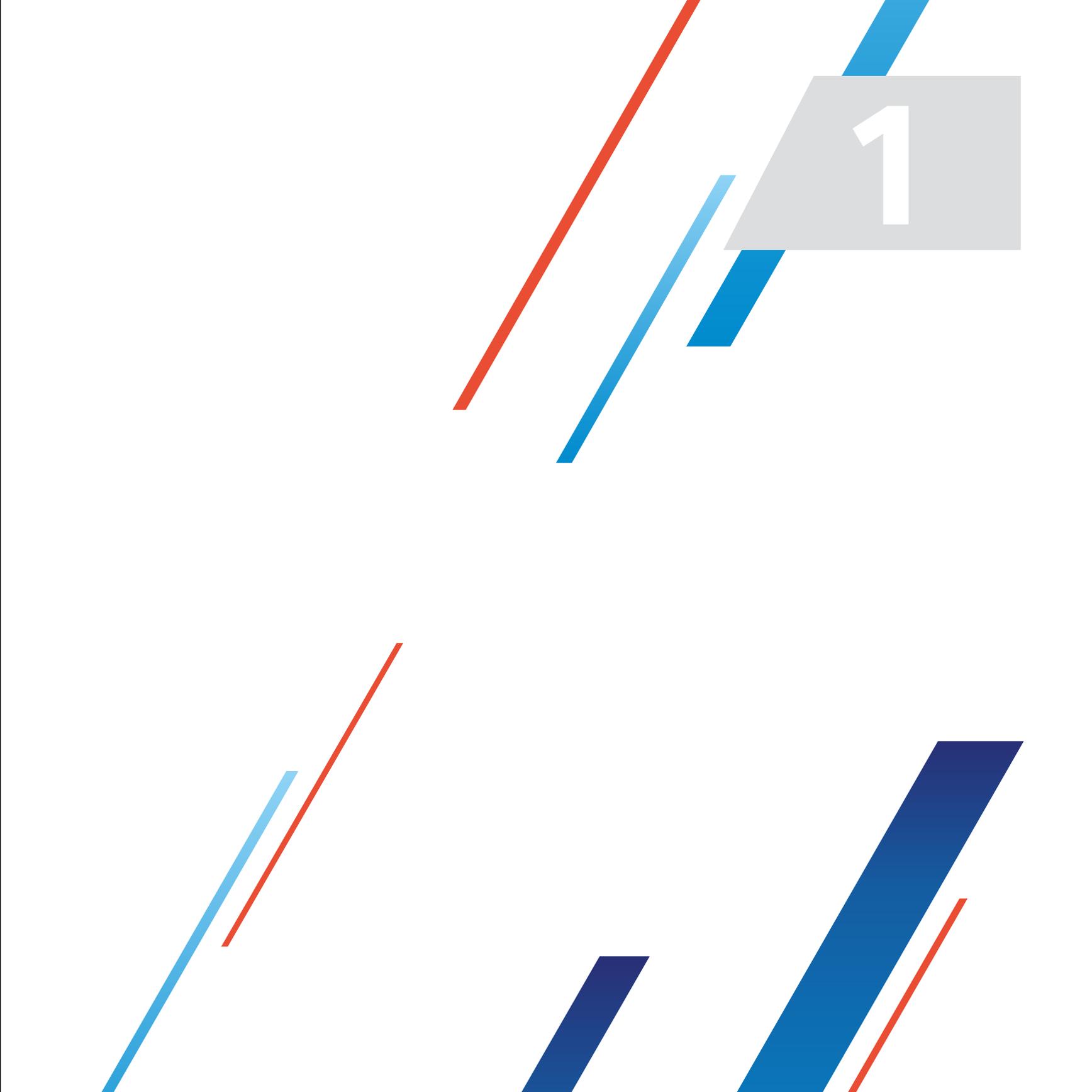
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# 1. MESSAGE FROM THE HEAD OF THE DIVISION

A landmark event in 2019 was the signing of general contracts for the construction of power units No. 7 and 8 of Tianwan NPP and power units No. 3 and 4 of Xudabao NPP in China, which will be equipped with Russian VVER-1200 reactors.

**ALEXANDER LOKSHIN**  
Head of the Engineering Division,  
President of JSC ASE EC, the Division's Holding Company



1

Dear colleagues and partners!

In 2019, the team of the Engineering Division once again demonstrated the ability to accomplish ambitious tasks facing us.

The key highlight of the year was the commencement of commercial operation of power unit No. 2 of Novovoronezh NPP-2 30 days ahead of schedule. Novovoronezh NPP-2 is now a fully operational two-unit nuclear power plant equipped with generation III+ reactors. Its design is ready for replication at overseas sites.

Active construction work is underway at Kursk NPP-2, Russia's first nuclear power plant with a state-of-the-art Russian design, VVER-TOI. In 2019, all scheduled construction milestones, including two government assignments, were completed on time and to a high standard.

We also continue to implement a number of large-scale engineering projects abroad. Last year, pre-commissioning was completed at power unit No. 1 of the Belarusian NPP, ROSATOM's first overseas turnkey project in recent history.

The construction of two power units of Rooppur NPP in Bangladesh is proceeding rapidly. The work completed in the reporting year included the concreting of foundation slabs for turbine halls, moving the reactor support truss into final position at power unit No. 1 right on schedule, and the installation of the core catcher at power unit No. 2.

The engineering design of Paks II NPP was accepted by the Owner.

A landmark event in 2019 was the signing of general contracts for the construction of power units No. 7 and 8 of Tianwan NPP and power units No. 3 and 4 of Xudabao NPP in China, which will be equipped with Russian VVER-1200 reactors.

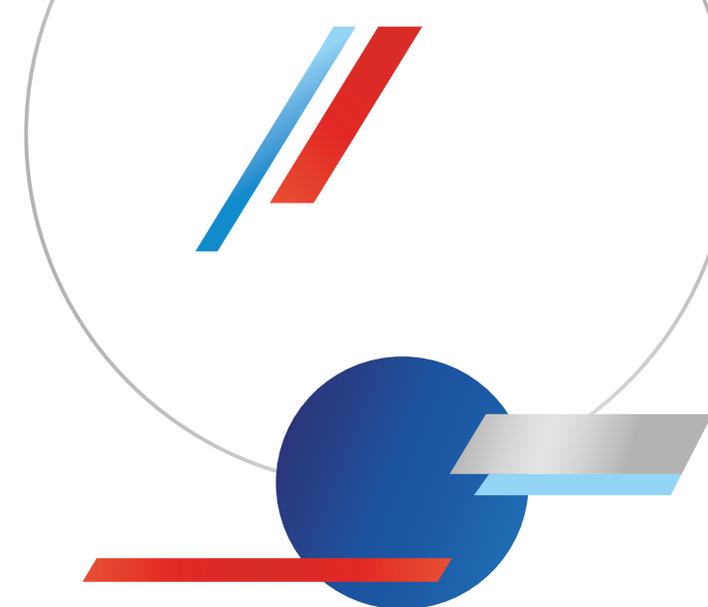
The Division's key priorities traditionally include improving the efficiency of construction and design quality. The reporting year witnessed large-scale changes in the Division and a redesign of all our key business areas. In 2019, the target organizational model of the Engineering Division was approved. Its important element is the Joint Design Institute established through the merger of three design organizations. It is worth mentioning that by integrating our design capabilities under a single management, we will be able to improve design quality by enhancing management efficiency and making sure that the efforts of our best design teams are focused on our prioritized tasks.

Other organizational changes made during the year included significantly expanding the scope of powers and responsibilities of project managers and enhancing NPP project teams.

Digital transformation is another important area of internal changes. Digital solutions developed by our specialists on the basis of the Multi-D multi-functional platform have always been and still remain one of the key tools for the optimization of design and construction processes. In 2019, we made significant progress in improving the efficiency of communication between the head office and construction sites abroad.

As always, the Engineering Division attaches great importance to sustainable development and is committed to maintaining high standards in the field of environmental protection, occupational safety and health and industrial safety.

Today, ahead of the 75<sup>th</sup> anniversary of the nuclear industry, the engineering business is still one of the key areas of ROSATOM's business. Strong performance at the key con-

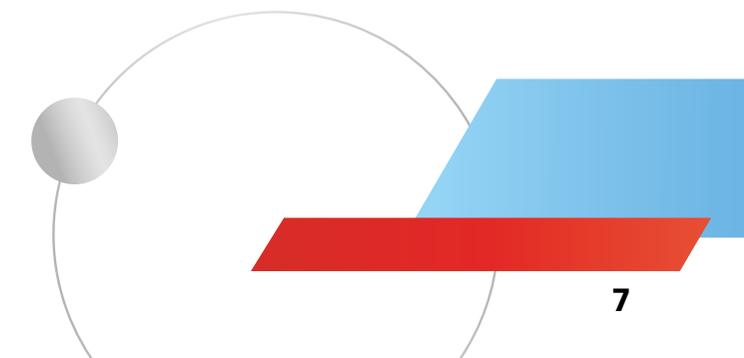


**Alexander Lokshin**

Head of the Engineering Division,  
President of JSC ASE EC, the Division's Holding Company

struction sites and new international agreements once again prove that our foreign partners have confidence in Russian nuclear technologies. We must live up to their expectations.

I am sure that the course that we have chosen and the fundamental principles underlying our operations, such as proper fulfilment of our obligations, a customer-centric approach, transparency and an open and honest dialogue with our partners, will enable us to respond to new market challenges, demonstrate a strong economic performance and enhance the prestige of the Russian nuclear industry globally.



## 2. OVERVIEW OF THE ENGINEERING DIVISION



## 2.1. ROLE OF THE ENGINEERING DIVISION IN THE STRUCTURE OF THE NUCLEAR INDUSTRY

The Engineering Division<sup>1</sup> of State Atomic Energy Corporation Rosatom (ROSATOM) headed by JSC ASE EC possesses extensive capabilities for managing the construction of complex engineering facilities. Currently, the Engineering Division specializes primarily in the implementation of large NPP construction projects on the Russian and international markets.

The Engineering Division consolidates the engineering and design capabilities of the nuclear industry. It comprises three design institutes: JSC ASE EC (formerly JSC NIAEP, Nizhny Novgorod), JSC Atomenergoproekt (Moscow) and JSC ATOMPROEKT (Saint Petersburg), as well as JSC ASE (Nizhny Novgorod). In 2019, the Strategic Council of ROSATOM approved the target organizational model of the Engineering Division\*.

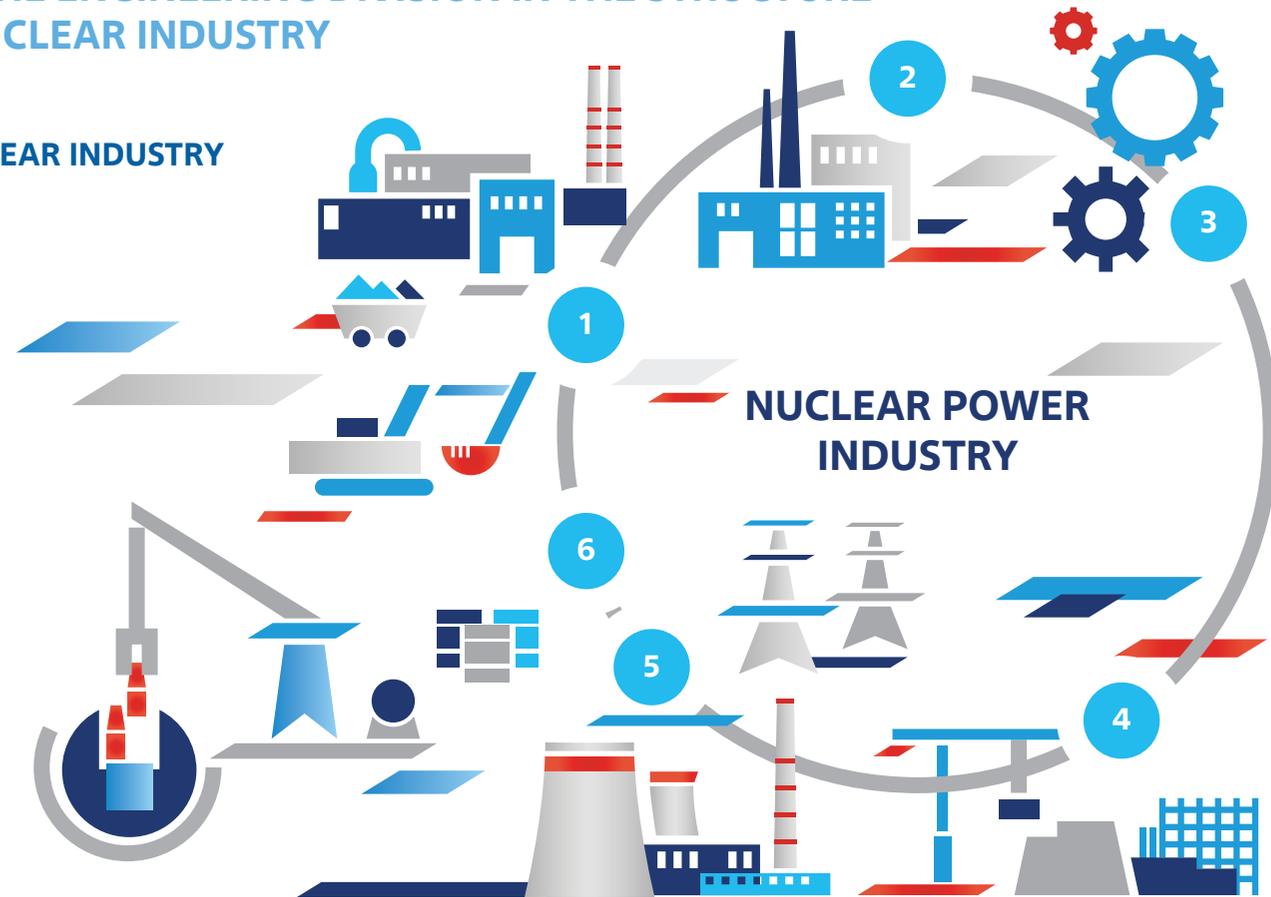
One of ROSATOM's strategic goals is to increase its share on international markets. Accordingly, the strategic goal of the Engineering Division is to remain a leader on the global market in terms of the number of power units under construction. A vital prerequisite for achieving this goal is strict compliance with contract terms and conditions. The top business priority for the Engineering Division is to meet the NPP construction time and cost requirements for both contracted and future projects.

<sup>1</sup> The names ROSATOM's Engineering Division, the Engineering Division and the Division are used as synonyms.

\* For more details, see Chapter 3, subsection 'Outcomes of transformation of the Engineering Division'.

## ROLE OF THE ENGINEERING DIVISION IN THE STRUCTURE OF THE NUCLEAR INDUSTRY

### STRUCTURE OF THE NUCLEAR INDUSTRY



- 1 MINING DIVISION**
  - Geological exploration
  - Uranium mining
  - Ore processing
- 2 FUEL DIVISION**
  - Conversion
  - Enrichment
  - Fuel fabrication
- 3 MECHANICAL ENGINEERING DIVISION**
  - Equipment design
  - Equipment manufacture
  - Equipment supply
  - Installation and pre-commissioning
  - Maintenance and upgrades
- 4 ENGINEERING DIVISION**
  - Design and engineering
  - NPP construction
- 5 POWER ENGINEERING DIVISION**
  - Power generation at NPPs
  - NPP servicing
- 6 BACK END**
  - SNF management
  - Decommissioning
  - RAW management



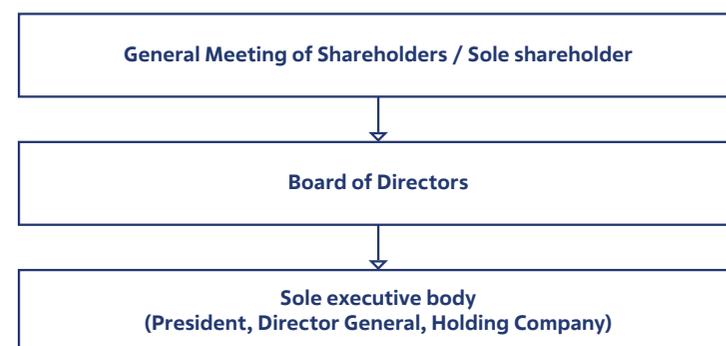
- 7 R&D**
- 8 DEVELOPING THE NORTHERN SEA ROUTE**
- 9 WIND POWER**
- 10 NUCLEAR MEDICINE**
- 11 ADVANCED MATERIALS AND TECHNOLOGIES**
- 12 DIGITAL PRODUCTS**
- 13 INFRASTRUCTURE SOLUTIONS**
- 14 ADDITIVE MANUFACTURING AND ENERGY STORAGE SYSTEMS**
- 15 PROCESS CONTROL SYSTEMS AND ELECTRICAL ENGINEERING**
- 16 ENVIRONMENTAL SOLUTIONS**

## 2.2. CORPORATE GOVERNANCE SYSTEM

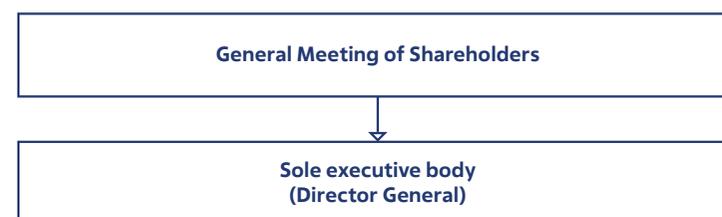
The corporate governance system of the Engineering Division is based on the applicable legislation currently in force in the Russian Federation and the Division's countries of operation, uniform industry-wide guidelines of ROSATOM and local regulations adopted in the furtherance of these guidelines. The companies of the Division are committed to complying with the best Russian and international corporate governance practices and standards.

In terms of their legal form, the companies forming ROSATOM's Engineering Division are joint-stock companies and limited liability companies.

Most of the key joint-stock companies that are part of the Engineering Division (JSC ASE EC, JSC ASE, JSC Atomenergoproekt, JSC ATOMPROEKT, JSC NIKIMT-Atomstroy and PJSC Energospetsmontazh) have a three-tier corporate governance system:



The limited liability company that is part of the Engineering Division (LLC Trest RosSEM) had a two-tier governance system as at December 31, 2019:



In 2019, the composition of the Board of Directors changed under resolutions of the General Meeting of Shareholders.

### As at January 1, 2019, the Board of Directors of JSC ASE EC comprised the following members<sup>2</sup>:

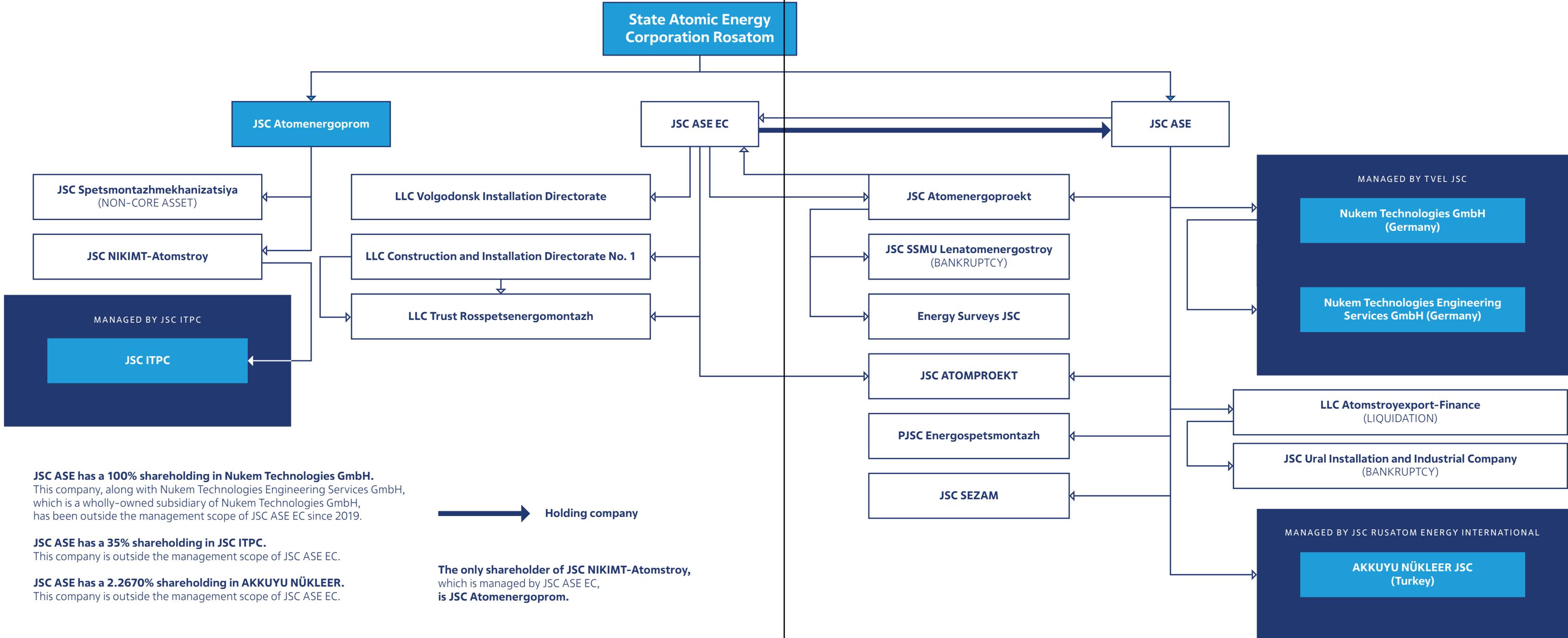
1. Alexander Vlasov
2. Dmitry Baydarov
3. Dmitry Paramonov
4. Valery Limarenko
5. Ivan Borisov

<sup>2</sup> Elected by the General Meeting of Shareholder on June 26, 2018 (Minutes of the Meeting No. 23).

### UNDER THE RESOLUTION OF THE EXTRAORDINARY GENERAL MEETING OF SHAREHOLDERS DATED FEBRUARY 13, 2019 (MINUTES OF THE MEETING NO. 26), THE FOLLOWING PERSONS WERE ELECTED MEMBERS OF THE BOARD OF DIRECTORS:

Alexander Vlasov	Boris Arseev	Dmitry Baydarov	Beslan Bargandzhiya	Dmitry Paramonov
<b>Chairman of the Board of Directors</b> Deputy Director of the International Business Department, Head of Global Development and Strategic Partnerships at ROSATOM	Deputy Director of the Corporate Development and International Business Unit, Director of the International Business Department of ROSATOM	Deputy Director of the Corporate Development and International Business Unit, Head of the Office of Support for New Businesses of ROSATOM	Deputy Director General, Director for Legal, Corporate and Property Affairs of JSC Rosenergoatom	Programme Director, Head of the Project Office for NPP Product Development of ROSATOM
Date and place of birth				
February 15, 1985, Moscow	September 22, 1971, Sverdlovsk	September 11, 1966, Penza-19, Penza Region	November 26, 1959, Sukhumi, Republic of Abkhazia	August 3, 1968, Moscow

**DIAGRAM OF THE CORPORATE GOVERNANCE STRUCTURE OF ROSATOM'S ENGINEERING DIVISION AS AT DECEMBER 31, 2019**



**JSC ASE has a 100% shareholding in Nukem Technologies GmbH.**  
 This company, along with Nukem Technologies Engineering Services GmbH, which is a wholly-owned subsidiary of Nukem Technologies GmbH, has been outside the management scope of JSC ASE EC since 2019.

**JSC ASE has a 35% shareholding in JSC ITPC.**  
 This company is outside the management scope of JSC ASE EC.

**JSC ASE has a 2.2670% shareholding in AKKUYU NÜKLEER.**  
 This company is outside the management scope of JSC ASE EC.

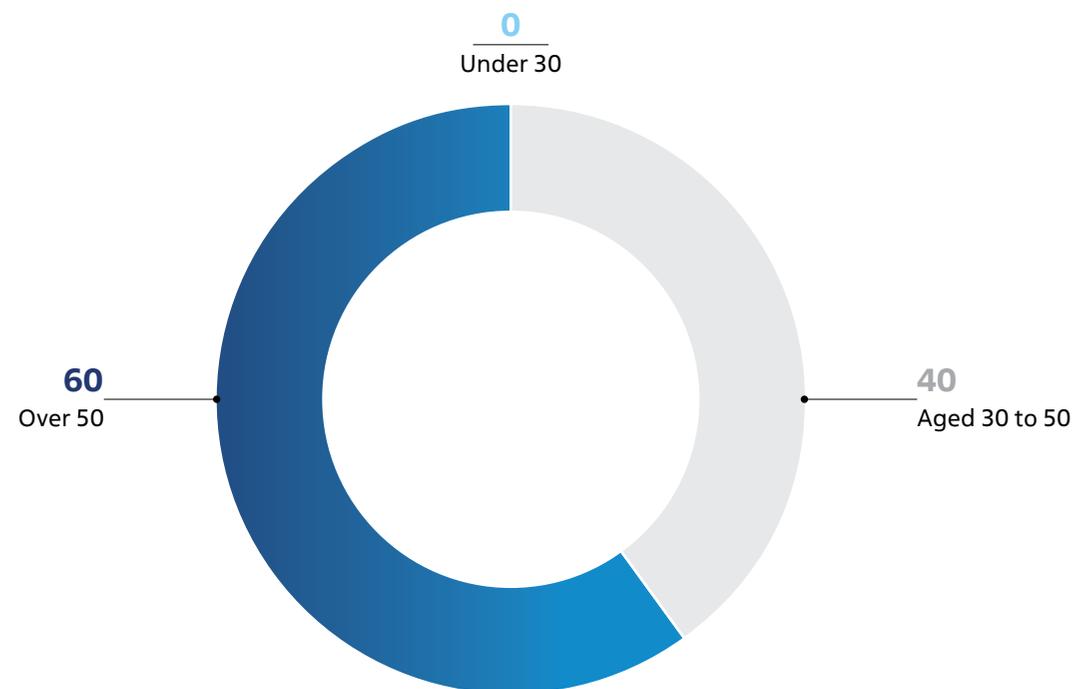
**→ Holding company**

**The only shareholder of JSC NIKIMT-Atomstroy, which is managed by JSC ASE EC, is JSC Atomenergoprom.**

Under the resolution of the Annual General Meeting of Shareholders dated June 30, 2019 (Minutes of the Meeting No. 29), no changes were made to the membership of the Board of Directors of JSC ASE EC; it remained unchanged as at December 31, 2019.

Certain provisions of the Corporate Governance Code recommended by Letter No. 06-52/2463 of the Bank of Russia dated April 10, 2014 are applied by the joint-stock companies of the Division taking into account the special characteristics of ROSATOM's legal status stipulated in the laws and regulations of the Russian Federation that ensure the unity of management in the nuclear industry and are incorporated in a number of local regulations.

**MEMBERS OF JSC ASE EC BOARD OF DIRECTORS IN 2019, WITH A BREAKDOWN BY AGE, %**



**THE COMPANIES OF ROSATOM'S ENGINEERING DIVISION ARE MEMBERS OF THE FOLLOWING ORGANIZATIONS:**

- The Association of Organizations of the Construction Complex of the Nuclear Industry (ACCNI);
- The International Project Management Association;
- The International Federation of Consulting Engineers (FIDIC);
- The National Association of Construction Engineering Consultants (NACEC);
- BuildingSMART Russia;
- Self-Regulating Organization Association of the Building Organizations in the Nuclear Branch SOYUZATOMSTROY;
- Self-Regulating Organization Association of the Engineering-Prospecting Organizations in the Nuclear Branch SOYUZATOMGEO;
- Self-Regulating Organization Association of the Designing Organizations in the Nuclear Branch SOYUZATOMPROEKT;
- The Russian Union of Employers in the Nuclear Industry, Power and Science.

## 2.3. SCOPE OF BUSINESS

The Engineering Division is the largest player on the global large NPP construction market. Currently, the Engineering Division ranks first globally in terms of the number of NPPs simultaneously under construction abroad and in terms of the portfolio of orders for NPP construction. The core business areas of the Division include:

- Design and construction of large NPPs in Russia and abroad;
- Digital technologies for managing complex engineering facilities based on the Multi-D platform.

Historically, the roots of all design institutes in the nuclear industry can be traced back to the All-Union State Design Institute Teploelektroproekt, which was established in Moscow in 1924 in order to implement the ambitious GOELRO Plan for the electrification of the country.

These institutes have designed NPPs in Russia and abroad, from the first ones to state-of-the-art generation III+ power units equipped with fast neutron reactors, as well as research reactors globally.

Projects implemented by the Nizhny Novgorod Design Institute include the Armenian NPP, whose earthquake-resistant reactor unit withstood the severe Spitak earthquake. Work on the Armenian NPP laid the foundation for the first Russian seismic engineering standards for NPPs.

### HISTORICAL OVERVIEW OF NUCLEAR ENGINEERING IN RUSSIA

#### 1954

The world's first nuclear power plant, Obninsk NPP designed by the Leningrad Design Institute, was put into operation.

#### 1966

The first NPP built by the USSR abroad, in Rheinsberg (German Democratic Republic), was put into operation.

#### 2001

Start-up of power unit No. 1 of Rostov NPP, the first power unit to be built after the reform period.

#### 2006

Adoption of the Federal Target Programme 'Development of the Nuclear Power and Industry in Russia for the Period from 2007 through 2010 and in the Long Term until 2015', which gave impetus to large-scale construction of state-of-the-art NPPs in Russia.

#### 2007

Commissioning of the first two power units of Tianwan NPP (China) equipped with VVER-1000 reactors. A distinguishing feature of the project is the requirement to ensure the NPP safety during beyond-design-basis accidents, including accidents with severe core damage, in compliance with the IAEA requirements.

#### 2010

Power unit No. 2 of Rostov NPP was put into commercial operation. It is the first NPP power unit put into commercial operation after the establishment of ROSATOM and approval of the Federal Target Programme 'Development of the Nuclear Power and Industry' and the first power unit built by JSC NIAEP as an engineering company.

#### 2013

Power unit No. 1 of Kudankulam NPP (India) reached the minimum controllable power level. This is the first NPP whose design incorporates passive heat removal systems, which has become a breakthrough in enhancing NPP safety.

#### 2015

Power unit No. 3 of Rostov NPP was put into commercial operation.

#### 2016

Power start-up of power unit No. 1 of Novovoronezh NPP-2, the world's first generation III+ power unit built under the Russian AES-2006 design with a VVER-1200 reactor unit, which incorporates all the post-Fukushima safety requirements.

#### 2017

First criticality was achieved at power unit No. 1 of Leningrad NPP-2, a new generation III+ unit which became a reference for ROSATOM's international projects worldwide.

#### 2018

Power units No. 3 and 4 of Tianwan NPP were put into commercial operation. Power unit No. 4 of Rostov NPP was put into commercial operation.

#### 2019

Generation III+ power unit No. 2 of Novovoronezh NPP-2 was put into operation.

## 2.4. BUSINESS GEOGRAPHY

The Engineering Division operates in Russia, Europe, the Middle East and North Africa, as well as in the Asia-Pacific. It is a leader on the global market for large NPP construction.

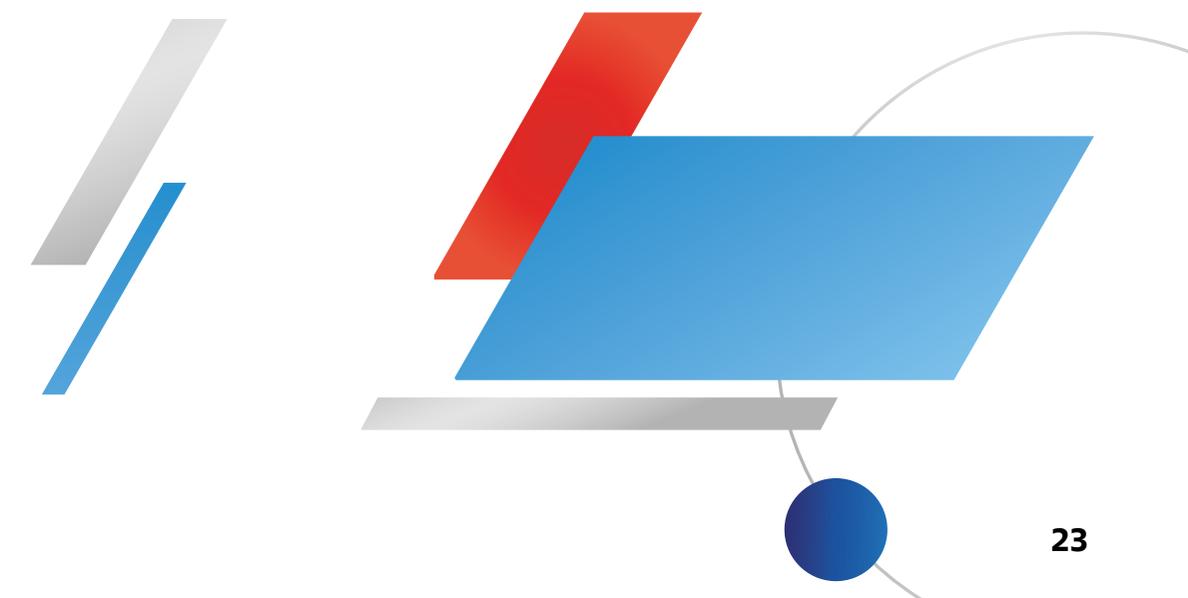
### OVERVIEW OF THE MAIN OVERSEAS PROJECTS IN THE ENGINEERING DIVISION'S PORTFOLIO

Name and location	Reactor	Main properties
Belarusian NPP, Republic of Belarus	VVER-1200	<ul style="list-style-type: none"> <li>■ The first NPP in the Republic of Belarus</li> <li>■ The largest joint project implemented by Russia and Belarus</li> <li>■ After commissioning, the NPP will cover up to 25% of electricity demand in Belarus</li> </ul>
Hanhikivi 1 NPP, Finland	VVER-1200	<ul style="list-style-type: none"> <li>■ The installed capacity will cover up to 10% of electricity demand of Finland by the end of the 2020s</li> <li>■ Being implemented under the BOO<sup>3</sup> model</li> </ul>
Akkuyu NPP, Turkey	VVER-1200	<ul style="list-style-type: none"> <li>■ The world's first NPP project implemented under the BOO model<sup>4</sup></li> <li>■ The first NPP in Turkey</li> </ul>
Paks II NPP, Hungary	VVER-1200	<ul style="list-style-type: none"> <li>■ Strict safety requirements aligned with EUR and WENRA standards</li> </ul>

<sup>3</sup> Build – Own – Operate. The Hanhikivi 1 NPP project is being implemented by JSC Rusatom Energy International.

<sup>4</sup> Build – Own – Operate. The Akkuyu NPP project is being implemented by JSC Rusatom Energy International.

Name and location	Reactor	Main properties
El Dabaa NPP, Egypt	VVER-1200	<ul style="list-style-type: none"> <li>■ The first NPP in Egypt</li> <li>■ The largest Russian-Egyptian project since the construction of the Aswan Dam</li> </ul>
Kudankulam NPP, India	VVER-1000	<ul style="list-style-type: none"> <li>■ High level of local content</li> <li>■ The southernmost VVER power units in the world</li> </ul>
Rooppur NPP, Bangladesh	VVER-1200	<ul style="list-style-type: none"> <li>■ The first NPP in Bangladesh</li> <li>■ The key energy project</li> <li>■ The NPP will cover 10% of the country's electricity demand</li> </ul>
Tianwan NPP, China	VVER-1000 VVER-1200	<ul style="list-style-type: none"> <li>■ One of the largest Russian-Chinese high-technology projects</li> </ul>
Xudabao NPP, China	VVER-1200	<ul style="list-style-type: none"> <li>■ A project aimed at expanding cooperation in the nuclear industry</li> </ul>



## 2.5. ADOPTION OF AND COMPLIANCE WITH QUALITY MANAGEMENT SYSTEMS AND STANDARDS

JSC ASE has in place an integrated management system (IMS), which includes quality management, environmental management, and occupational safety and health management systems.

In 2019, the UK Branch of a certification body BUREAU VERITAS Certification Holding SAS performed the first compliance audit of the operating IMSs of JSC ASE EC and JSC ASE to verify their compliance with the ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 standards. Following the successful completion of the audit, the validity of the following certificates of compliance was confirmed:

- ISO 9001:2015: No. RU229233Q-U/1, version 1 dated May 22, 2018 (valid until May 21, 2021);
- ISO 14001:2015: No. RU229233E-U/1, version 1 dated May 22, 2018 (valid until May 21, 2021);
- OHSAS 18001:2007: No. RU229233H-U/1, version 1 dated May 22, 2018 (valid until May 21, 2021).

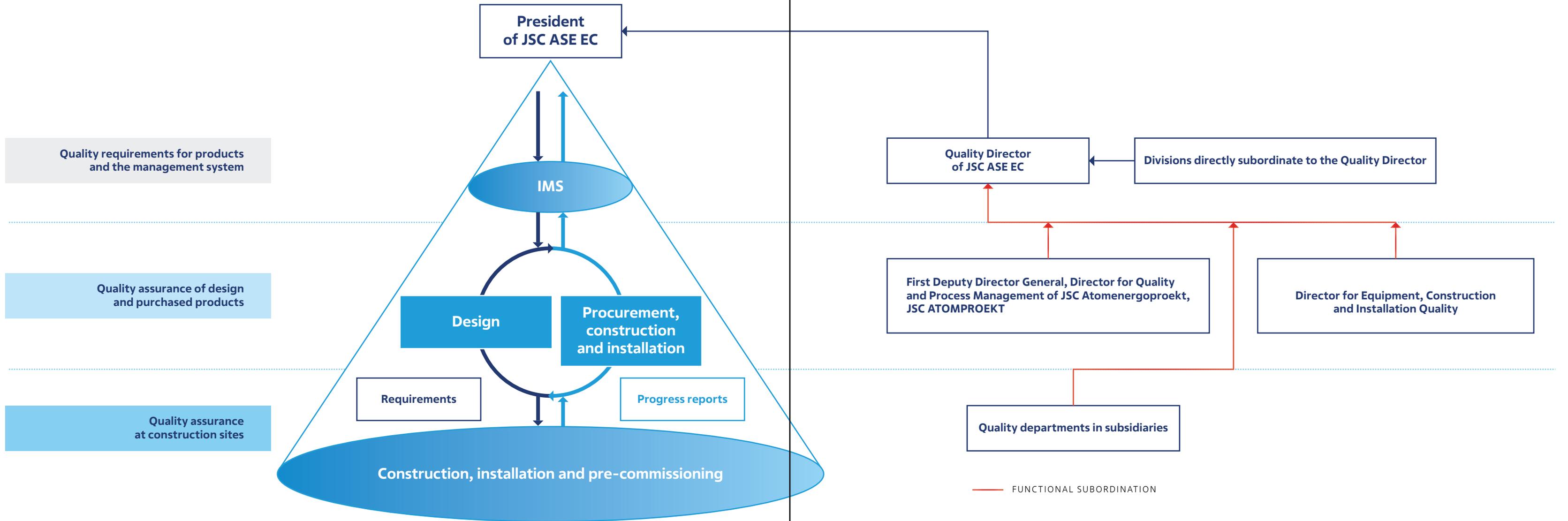
## CERTIFICATES OF COMPLIANCE OF COMPANIES IN THE ENGINEERING DIVISION WITH QUALITY AND ENVIRONMENTAL SAFETY STANDARDS

Companies	ISO 14001:2015	ISO 9001:2015	OHSAS 18001:2007	ISO / IEC 27001:2013	ISO 45001:2018
JSC ASE EC	+	+	+	+	
JSC ASE	+	+	+		
JSC ATOMPROEKT	+	+	+		
JSC Atomenergoproekt		+			
JSC NIKIMT-Atomstroy	+	+	+		
PJSC Energospetsmontazh	+	+	+		
LLC Trest RosSEM	+	+			+

In 2020, JSC ASE EC and JSC ASE plan to undergo the certification of the occupational safety and health management system to the ISO 45001:2018 international standard.

As part of the Division's transformation initiative and the establishment of an integrated management system, JSC ASE EC, JSC ASE, JSC Atomenergoproekt and JSC ATOMPROEKT have made a decision to centralize their quality management functions. In November 2019, a plan for the integration of management systems was approved, and JSC ASE EC Director for Quality Sergey Guschin was appointed as management representative responsible for the integrated management system in JSC ASE EC, JSC ASE, JSC Atomenergoproekt and JSC ATOMPROEKT.

**CENTRALIZATION OF QUALITY MANAGEMENT FUNCTIONS**



### **3. KEY RESULTS AND PERFORMANCE INDICATORS OF THE DIVISION**



## 3.1. KEY RESULTS

Indicator	2017	2018	2019
Consolidated revenue, RUB billion	175.2	201.9	231.1
Average headcount, persons	14,450	19,191	26,713 <sup>5</sup>
Taxes and deductions accrued/paid, RUB billion	8.56/6.24	14.63/15.43	20.81/8.84
Number of events rated at level 2 and higher on the international INES scale	0	0	0
Number of new jobs created	3,678	6,852	5,535

<sup>5</sup> The scope of consolidation for the calculation of the indicator includes JSC ASE EC, JSC ASE, JSC Atomenergoproekt, JSC ATOMPROEKT, JSC NIKIMT-Atomstroy, LLC Trest RosSEM, PJSC Energospetsmontazh, JSC SEZAM, LLC Construction and Installation Directorate No. 1, LLC VDMU, Nukem Technologies GmbH and Nukem Technologies Engineering Services GmbH. External part-time employees and employees working under civil law contracts were not included in the calculation of the indicator.

Consolidated revenue grew by 14.5% year on year as the Kursk NPP-2, Rooppur NPP and Belarusian NPP projects entered the active stage of implementation.

The growth of the average headcount and the number of new jobs was mainly caused by an expansion of the scope of work performed by the Division at the Kursk NPP-2 and Belarusian NPP construction sites.

## 3.2. OUTCOMES OF TRANSFORMATION OF THE ENGINEERING DIVISION

Transformation of the Engineering Division continued in 2019, covering all core areas of its business.

**The key goal of the transformation initiative, which was launched in 2018, is to ensure that the Division is ready to fulfil orders for NPP construction in full and on schedule, and to make the Division more competitive on the international market.**

### KEY AREAS OF TRANSFORMATION OF THE ENGINEERING DIVISION



## KEY OUTCOMES OF TRANSFORMATION OF THE ENGINEERING DIVISION IN 2019

Focus area	Key outcomes
Organizational development	<ul style="list-style-type: none"> <li>The first stage of implementation of the Division's target organizational model was completed.</li> <li>The management structure and the process model of the Joint Design Institute were developed.</li> <li>A decision-making system was introduced.</li> <li>Approaches to process modelling and regulation were revised.</li> </ul>
Project management and NPP construction	<ul style="list-style-type: none"> <li>The scope of project managers' powers and resources was expanded.</li> <li>The scope of responsibility and the powers of project managers were defined for the entire project life cycle.</li> <li>Approaches to the development of the organizational structure of projects were revised.</li> <li>The key members of project teams underwent training in the operation of the corporate project management system.</li> </ul>
Design	<ul style="list-style-type: none"> <li>The design system was integrated with the procurement system.</li> <li>The second stage of development of standardized technical specifications for equipment was completed.</li> <li>A standardized task structure was developed and approved; standards for front-end engineering design were introduced for the Joint Design Institute.</li> <li>Solutions for the implementation of a single technical policy were produced<sup>6</sup>.</li> </ul>

<sup>6</sup> This involved the development of the following solutions: an integrated electronic archive, an integrated database of research and technical documentation, and an integrated database of standard design solutions.

Focus area	Key outcomes
Construction	<ul style="list-style-type: none"> <li>A comprehensive time and cost management system, TCM NC<sup>7</sup>, is being implemented.</li> <li>Automation of project budget planning and control was launched;</li> <li>A plan was approved to establish the Divisional Competence Centre for rapid concreting and reinforcing.</li> <li>Twelve best available technologies for the construction of Rooppur NPP, El Dabaa NPP and Kursk NPP-2 were adopted.</li> </ul>
Personnel and motivation	<ul style="list-style-type: none"> <li>A team KPI, the duration and cost of NPP construction in Russia and abroad, was introduced across the Division.</li> <li>The first stage of social infrastructure development for the personnel working at the Rooppur NPP construction site was completed.</li> <li>An open competition, Time to Build, was held, with 200 applicants and 12 winners, including experts from other industries. The winners were recruited by the Division.</li> <li>An advanced training programme was launched for project managers of NPPs under construction in Russia and abroad.</li> <li>The first cohort of graduates who had completed the joint master's degree programme of ASE and the Higher Engineering School of NRNU MEPhI were recruited.</li> <li>The Division won a silver medal in the Building Information Modelling (BIM) category in the WorldSkills Kazan 2020 international competition.</li> </ul>

More details on digital transformation are provided in Chapter 6 'Digital Technologies and Products'.

<sup>7</sup> Total Cost Management Nuclear Construction.

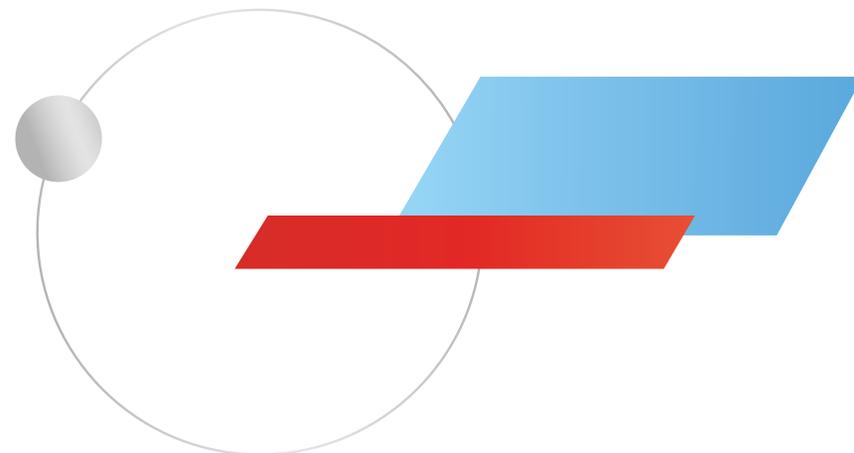
In 2019, the Strategic Council of ROSATOM approved the target organizational model of the Engineering Division and the plan for its implementation.

According to the target organizational model, the Engineering Division will comprise the holding company (combining JSC ASE EC and JSC ASE), the Joint Design Institute and the construction and installation unit comprising civil engineering and thermal installation companies.

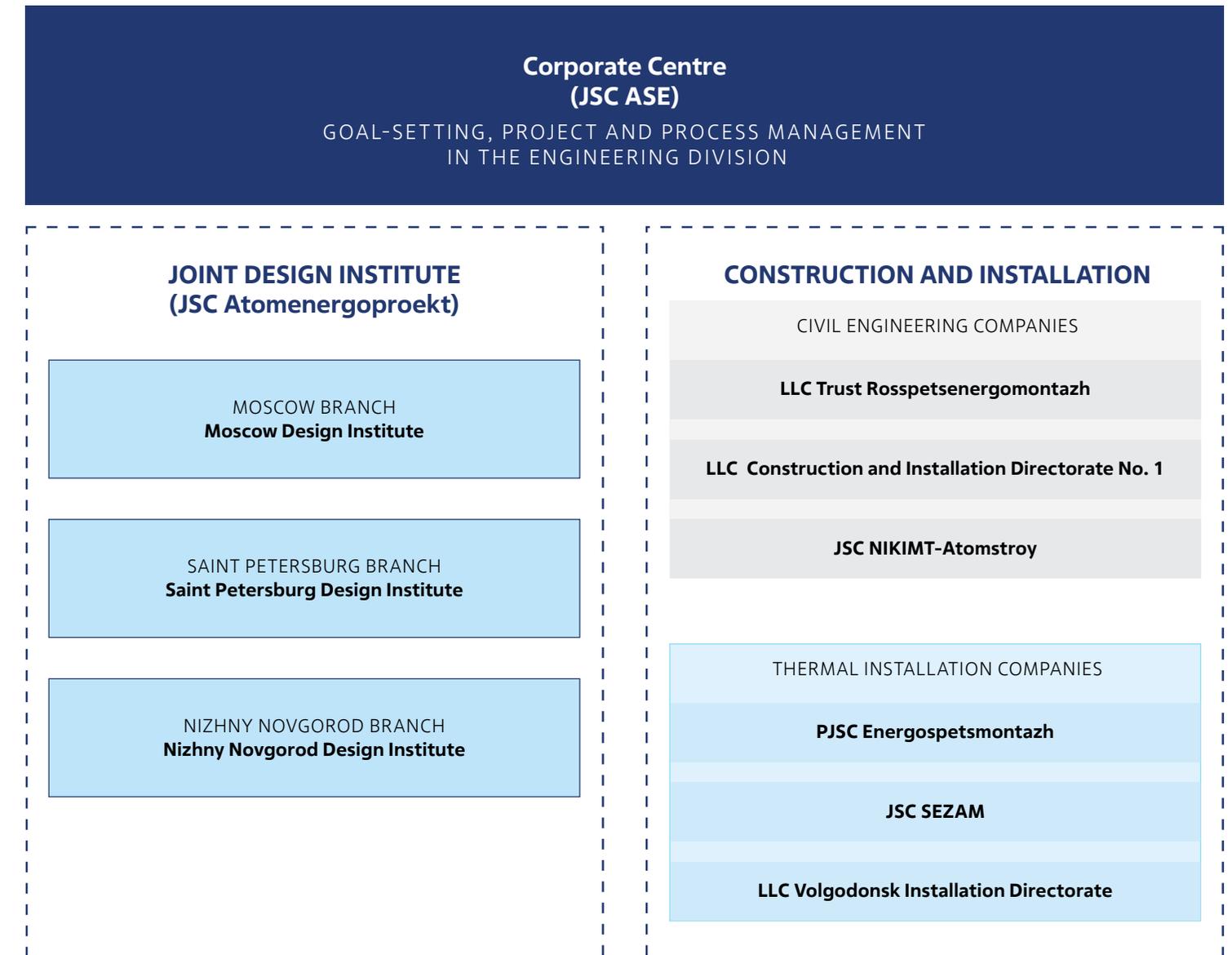
**In 2019, the main focus was on the spin-off of the Joint Design Institute. The powers of JSC ASE EC as the sole executive body of JSC Atomenergoproekt and JSC ATOMPROEKT were terminated; Ruben Topchiyan was appointed Director General of JSC Atomenergoproekt and JSC ATOMPROEKT.**

**Two branches of JSC Atomenergoproekt were created in Nizhny Novgorod and in Moscow.**

The main obligation and challenge for the Engineering Division is to build NPPs on schedule and on budget. A redesign of the project management structure and system as part of the transformation will enable the Division to make a flexible offer tailored to the individual needs of each NPP Customer.



## TARGET ORGANIZATIONAL MODEL OF THE ENGINEERING DIVISION



### 3.3. NPP CONSTRUCTION COST MANAGEMENT

An effective time and cost management system is of crucial importance for ROSATOM, given that its portfolio of orders is worth billions of US dollars. Accordingly, a project office for the introduction of the TCM NC (Total Cost Management Nuclear Construction) framework and optimization of construction management processes was established in the Engineering Division in 2019.

**The goal of the TCM NC programme is to streamline NPP construction project management processes, develop the competences of JSC ASE EC employees and speed up the implementation of IT solutions that will enable the Division to manage NPP construction time and cost more efficiently.**

A programme for the introduction of the Industry-Wide Integrated Cost and Time Management System for the Construction of Nuclear Facilities (TCM NC) was launched in 2017.

#### THE MAIN FOCUS AREAS OF IMPLEMENTATION OF THE TCM NC FRAMEWORK INCLUDE:

- Developing and approving methodological guidelines;
- Organizational changes, personnel engagement and training;
- Pilot operation of the information system.

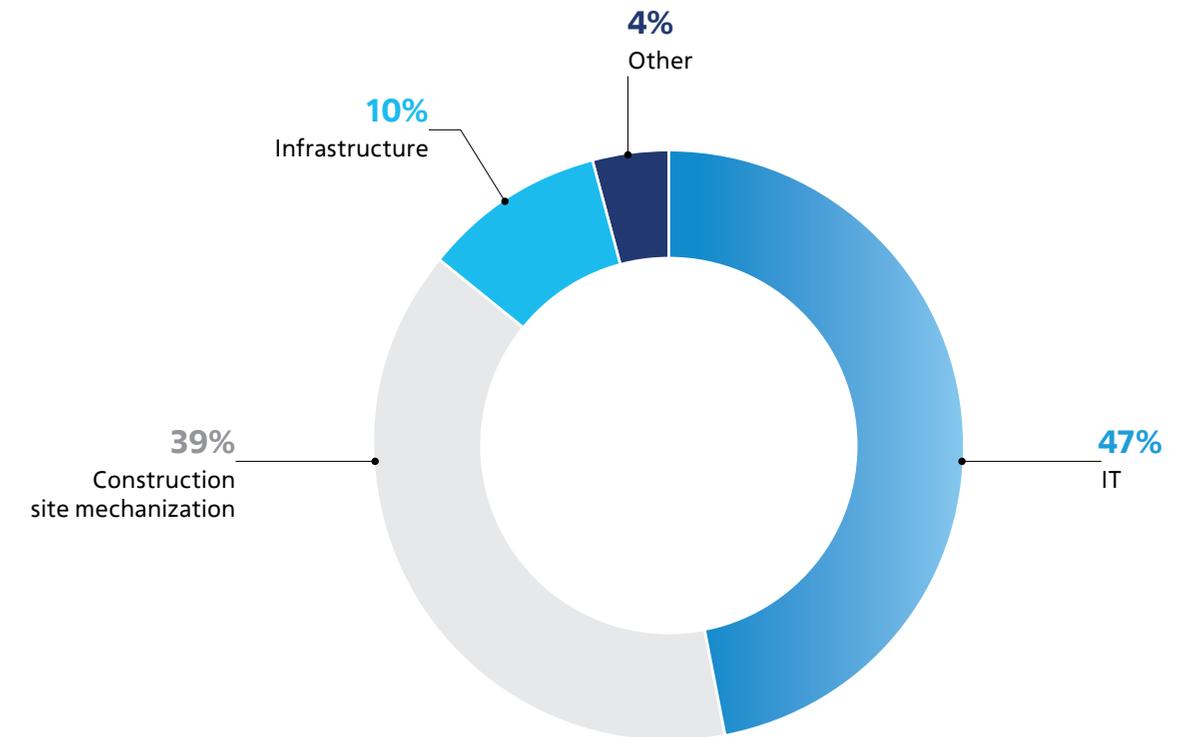
### 3.4. INVESTMENT ACTIVITIES

The investment portfolio of the Engineering Division is designed to support NPP design and construction as part of ROSATOM's investment and construction projects.

projects involve upgrading electronic and computer equipment used at key assets and providing process automation tools and software. Infrastructure investments enable the Division to upgrade its fixed assets and ensure the required level of safety.

As part of its investment projects aimed at equipping construction sites, the Division gives priority to meeting operational needs to enable timely execution of contracts for the construction of NPPs and other facilities as part of ROSATOM's investment and construction projects. IT

#### INVESTMENT PORTFOLIO OF THE ENGINEERING DIVISION IN 2020



# 4. KEY EVENTS IN 2019



## KEY EVENTS IN 2019

Operational milestones	
NPP	Results in 2019
<b>Russian Federation</b>	

### Kursk NPP-2

- All construction activities scheduled for 2019 were completed on time and to the required standard. These included: concreting of the second layer of the internal containment vessel of power unit No. 1, installation of the thrust truss and the internal containment vessel of power unit No. 2, moving the core catcher of power unit No. 1 into final position, and the commencement of concreting of the foundation slab of the reactor building of power unit No. 2.

### Novovoronezh NPP-2

- Power unit No. 2 of Novovoronezh NPP-2 was put into commercial operation ahead of schedule. This is a generation III+ power plant with improved technical and economic characteristics.

#### START-UP OF POWER UNIT NO. 2 OF NOVOVORONEZH NPP-2

**On October 31, 2019, power unit No. 2 of Novovoronezh NPP-2 was commissioned 30 days ahead of schedule. This is a major landmark for the Russian nuclear power industry.**

**Novovoronezh NPP-2 became the first nuclear power plant built in the former Soviet Union, the first in a series of generation III+ NPPs built in Russia, and the first NPP using fundamentally new technical and managerial solutions.**

**To date, projects to build Russian-design generation III+ power units have been initiated in Bangladesh, the Republic of Belarus, Finland, Hungary and a number of other countries.**

### Leningrad NPP-2

- Detailed design documentation was issued to enable the start of equipment testing and trials and hydraulic tests of the reactor's primary coolant circuit as part of commissioning of power unit No. 2.

Operational milestones	
NPP	Results in 2019
<b>Asia</b>	
<b>Rooppur NPP, Bangladesh</b>	<ul style="list-style-type: none"> <li>Concreting of the foundation slabs of the turbine hall of power units No. 1 and No. 2 was completed.</li> <li>Concreting of the cylindrical part of the first layer of the internal containment vessel at power unit No. 1 was completed.</li> <li>The core catcher was moved into final position at power unit No. 2, and the cantilever truss was installed.</li> </ul>
<b>Kudankulam NPP, India</b>	<ul style="list-style-type: none"> <li>Detailed design documentation and equipment were provided for power units No. 3 and 4.</li> <li>The core catcher and the cantilever truss were installed at power unit No. 3.</li> </ul>
<b>Tianwan NPP, China</b>	<ul style="list-style-type: none"> <li>A general contract for the construction of power units No. 7 and 8 was signed.</li> </ul>
<b>Xudabao NPP, China</b>	<ul style="list-style-type: none"> <li>An engineering design contract was signed for power units No. 3 and 4.</li> <li>A general contract for the construction of power units No. 3 and 4 was signed.</li> </ul>
<b>Europe</b>	
<b>Paks II NPP, Hungary</b>	<ul style="list-style-type: none"> <li>The engineering design of the future NPP was developed and approved by the Owner.</li> <li>The construction of the first construction and installation facilities was commenced.</li> <li>Contracts were signed for the supply of the main APCS components.</li> <li>A contract was signed for the manufacture and supply of the core catcher.</li> </ul>

## Operational milestones

NPP	Results in 2019
<b>Europe</b>	
<b>Belarusian NPP, Republic of Belarus</b>	<ul style="list-style-type: none"> <li>Auxiliary power supply was provided at power unit No. 1 of the Belarusian NPP. Pre-commissioning was completed at power unit No. 1. Specialists started the implementation of the commissioning programme for power unit No. 1. The equipment airlock was installed at power unit No. 2; installation of the main equipment was completed.</li> </ul>
<b>Hanhikivi 1 NPP, Finland</b>	<ul style="list-style-type: none"> <li>The preparation of the required licensing documentation and preparatory work at the site were underway. A contract was signed for the supply of the main APCS components<sup>8</sup>.</li> </ul>
<b>Middle East and North Africa</b>	
<b>El Dabaa NPP, Egypt</b>	<ul style="list-style-type: none"> <li>The Egyptian Nuclear and Radiological Regulatory Authority issued a permit approving the selection of the construction site for the NPP.</li> <li>Engineering surveys were completed at the site of the future NPP; preparatory work involving local contractors was started at the site.</li> </ul>
<b>Akkuyu NPP, Turkey</b>	<ul style="list-style-type: none"> <li>Concreting of the foundation slab of the reactor building of power unit No. 1 was completed; the core catcher was delivered to the site; site grading was completed ahead of schedule.</li> <li>A construction licence was obtained for power unit No. 2.</li> <li>A package of licensing documents was submitted to the Turkish Atomic Energy Authority for power unit No. 3.</li> <li>The Republic of Turkey Transmission Grid Connection Agreement was signed<sup>9</sup>.</li> </ul>

<sup>8</sup> This project is being implemented by JSC Rusatom Energy International.

<sup>9</sup> This project is being implemented by JSC Rusatom Energy International.

## Events in the field of sustainable development

Personnel	
<b>Attractive Employer 2019</b>	<ul style="list-style-type: none"> <li>The Division was given the title 'Attractive Employer 2019' by the Superjob.ru recruitment portal (for the seventh time between 2012 and 2019).</li> </ul>
<b>45<sup>th</sup> WorldSkills Professional Skills Competition</b>	<ul style="list-style-type: none"> <li>One gold and three silver medals.</li> <li>A representative of the Division also acted as a coordinator and authorized technical specialist of the Competition in IT Network Systems Administration.</li> </ul>
<b>Fourth Industry-Wide Professional Skills Competition AtomSkills 2019</b>	<ul style="list-style-type: none"> <li>Two silver and three bronze medals across five competences.</li> <li>Representatives of the Division also acted as coordinators and authorized experts of the Competition in nine competences.</li> </ul>
<b>WorldSkills Hi-Tech National Competition</b>	<ul style="list-style-type: none"> <li>Two gold medals, one first, one second and two third places.</li> <li>Representatives of the Division also acted as coordinators and authorized experts of the Competition in three competences: Engineering, Budgeting, and Non-Destructive Testing.</li> </ul>
<b>Sixth industry-wide competition 'ROSATOM's Person of the Year'</b>	<ul style="list-style-type: none"> <li>First places in three corporate and special categories.</li> <li>Prizes in five corporate and special categories.</li> <li>The best employees were also selected in four divisional categories.</li> </ul>
<b>Seventh Competition 'The Best Expert in the Nuclear Construction Industry 2019'</b>	<ul style="list-style-type: none"> <li>Eight gold, nine silver and twelve bronze medals.</li> </ul>
<b>SAP Quality Awards 2019</b>	<ul style="list-style-type: none"> <li>Silver award in the 2019 SAP Quality Awards competition in the Business Transformation category.</li> </ul>

Events in the field of sustainable development

Personnel

Leadership Energy industry-wide ranking

- The first 12 positions in the ranking of young specialists who participated in the programme from 2017 through 2019.
- The first 12 positions and 14<sup>th</sup> to 19<sup>th</sup> positions in the ranking of young specialists participating in the programme from 2018 through 2020.

Industry-wide competition of improvement suggestions and projects for the development of the ROSATOM Production System

- Two first prizes.

Events in the field of sustainable development

Non-operational events

■ JSC ASE EC continues to successfully introduce the project management practice; it is the first Russian company issued with an international certificate of compliance with the criteria for competence class 4 in the field of project, programme and portfolio management under the IPMA Delta model and a multiple winner of international events in this field.

The IPMA Organizational Competence Baseline (OCB) standard is the first standard defining the requirements for a company's competence in project management.

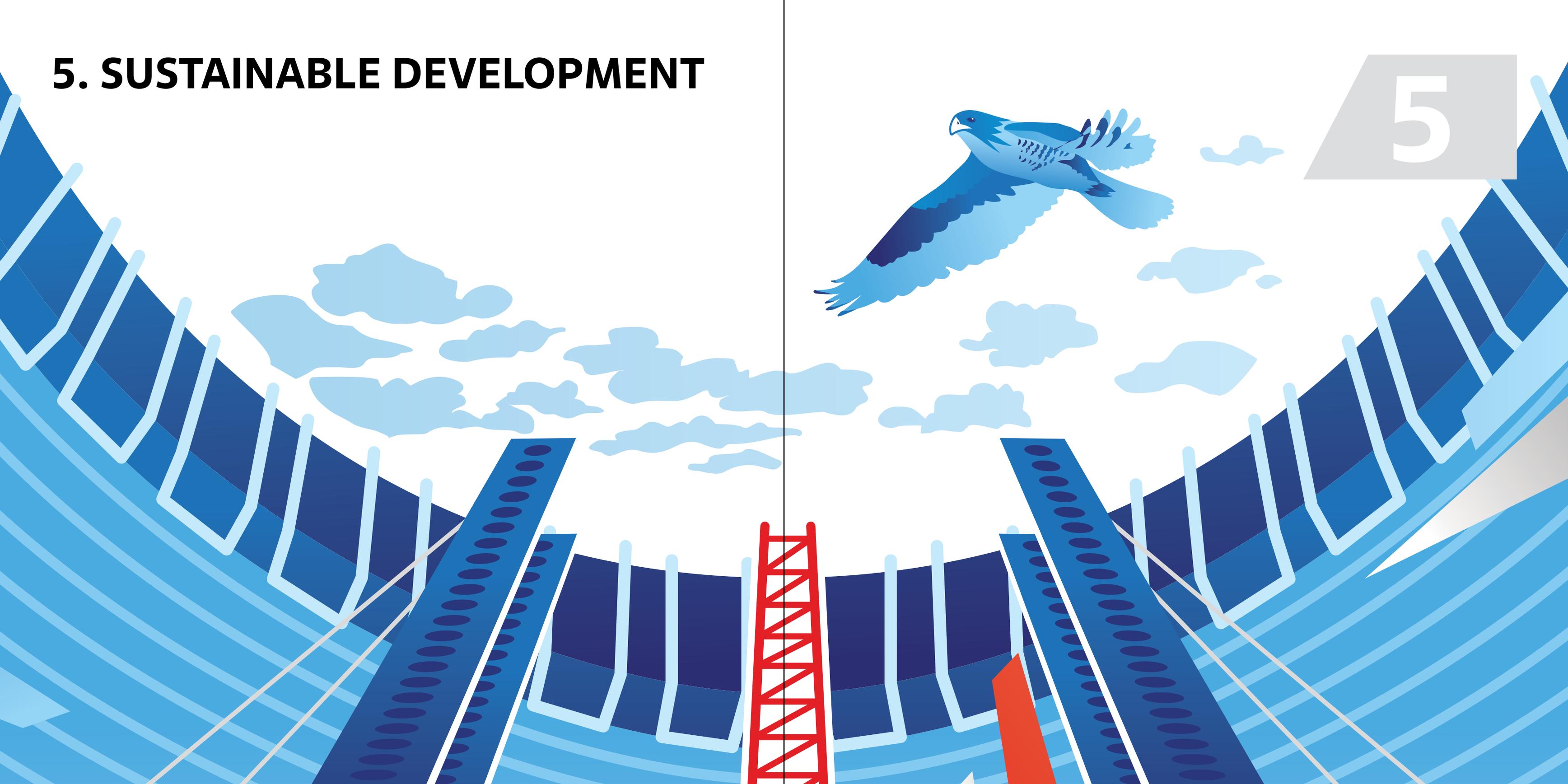
Events in the field of sustainable development

Public reporting

■ 22<sup>nd</sup> competition of annual reports held by the Moscow Exchange and RCB Media Group: victory in the Best Sustainability Disclosure in the Annual Report category.

# 5. SUSTAINABLE DEVELOPMENT

5



The Engineering Division defines sustainable business development as an activity that is not only beneficial from the economic and environmental perspective but also promotes the social interests of society and governments. Given its unique role as a designer and builder of NPP power units, the Division is required to ensure the safety and reliability of nuclear facilities in all countries where it operates.

## CONTRIBUTION OF THE ENGINEERING DIVISION TO THE ACHIEVEMENT OF THE UN SUSTAINABLE DEVELOPMENT GOALS

UN Sustainable Development Goals	Contribution of the Division's operations
	<p><b>Design and construction of large NPPs</b></p> <p>Power start-up and commissioning of NPP power units make a significant contribution to providing the regions and their residents with safe and competitive electricity supply.</p>
	<p><b>Economic development of the regions of operation</b></p> <p>The Division provides stable salaries and good working conditions for its employees and creates new jobs.</p>
	<p><b>Economic development of the regions of operation</b></p> <p>The Engineering Division is committed to developing the regions where NPPs are being built and takes steps to support them.</p>
	<p><b>Efficient natural resource management (energy efficiency)</b></p> <p>The Division's operations are underpinned by efficient natural resource management and energy efficiency.</p>
	<p><b>Environmental and industrial safety at construction sites</b></p> <p>Nuclear power plants are characterized by one of the lowest levels of carbon emissions. The design of NPPs with VVER reactors helps to ensure that they emit no carbon dioxide into the atmosphere, while the emissions of other pollutants are very low. The main objective of NPP design and construction by the Engineering Division is the safe NPP operation.</p>
	<p><b>Partnership for sustainable development</b></p> <p>ROSATOM's Engineering Division fosters relations on the global, regional and local level and promotes partnership with the governments, businesses and society in the regions of operation.</p>

## KEY PERFORMANCE INDICATORS OF THE ENGINEERING DIVISION IN THE FIELD OF SUSTAINABLE DEVELOPMENT

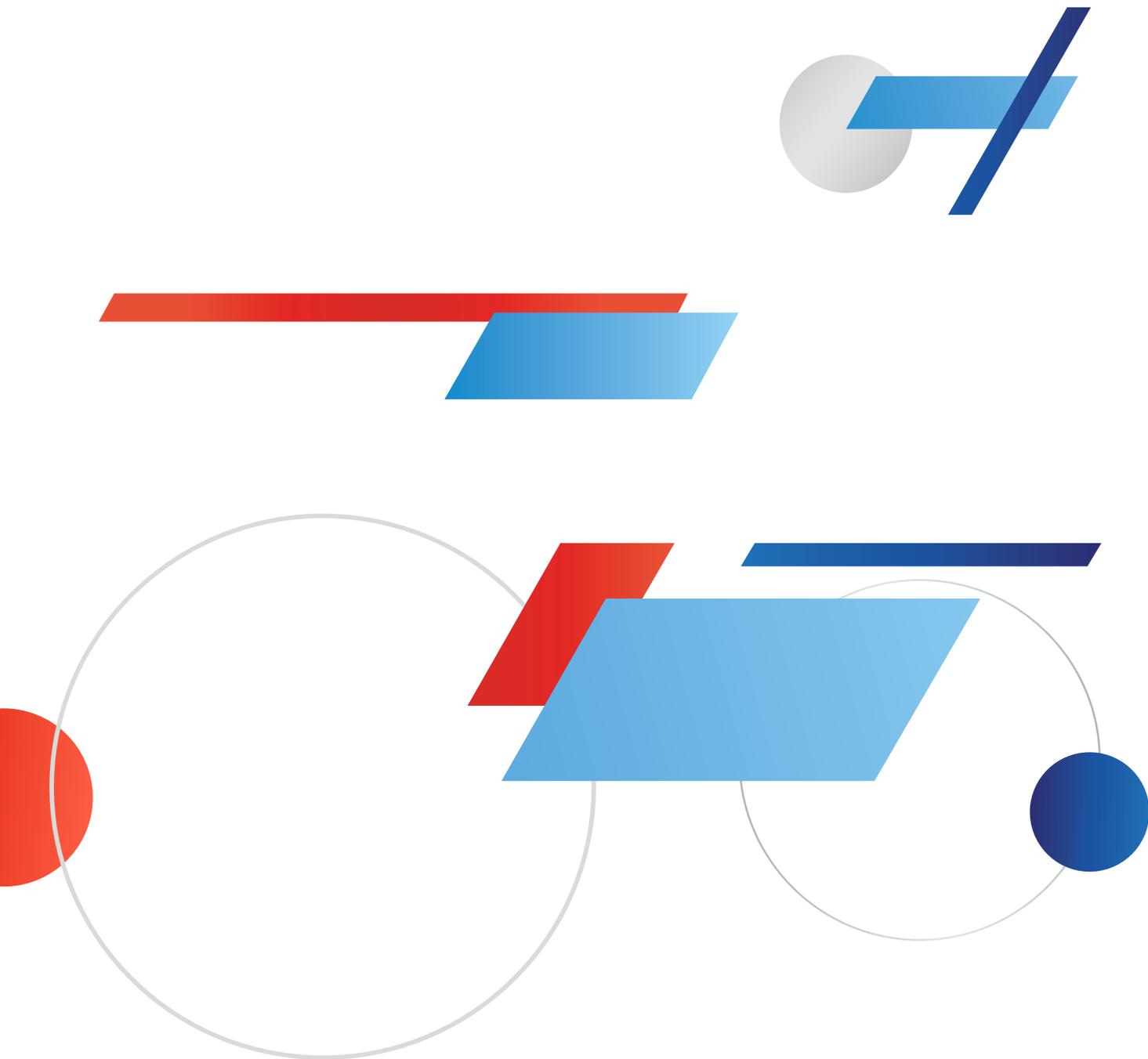
Indicator	2017	2018	2019
Occupational health and safety costs, RUB billion	0.3	0.5	0.4
LTIFR	0.06	0.05	0.06
Number of employees who underwent training, persons	10,557	12,434	15,670
Charity expenses, RUB billion	0.27	0.51	0.57
Number of accidents and fires	0	0	0
Number of events rated at level 2 or higher on the INES scale	0	0	0
Reduction in heat consumption <sup>10</sup>	-36.7%	+4.6%	-8.1%
Reduction in pollutant emissions	-13%	-66.4%	-21.6%
Expenditure on environmental measures, RUB million	17.65	20.14	29.60

<sup>10</sup> For all companies forming part of the Engineering Division which have concluded a direct contract with the service provider.



# 6. DIGITAL TECHNOLOGIES AND PRODUCTS





## 6.1. DIGITIZATION

Digitization is one of the focus areas and an important transformation tool of the Engineering Division. Digital transformation involves redesigning the company's business model by applying digital technologies in order to achieve a multiple increase in sales or improve business performance. It involves leveraging the existing opportunities to radically transform business processes and make them more efficient. The efforts of the Engineering Division in this area are focused primarily on transforming design and capital construction processes.

**The Engineering Division is responsible for implementing the NPP Construction Process Digitization programme forming part of ROSATOM's Uniform Digital Strategy.**

To implement NPP construction projects in Russia and abroad, the Division applies its own project management methodology enabling it to efficiently manage key aspects of construction projects, such as the budget, the schedule and quality. This methodology provides the basis for the Multi-D platform, which is a package of flexible tools and ready functional modules for creating, supporting and developing software to enable end-to-end management of construction of complex engineering facilities.

**Multi-D is a line of products based on a single platform and designed to support end-to-end management of construction of complex engineering facilities.**

The Multi-D system makes it possible to provide comprehensive information support for a project at all stages of its implementation. The technology relies on a holistic approach to NPP construction project management. It involves creating a 3D model integrating all stages, from design to operation, in a single database.

A high-quality information model of an NPP is essentially a standard requirement stipulated in contracts for NPP construction. This model provides the basis for a digital twin of an NPP during its entire life cycle, including its operation, upgrades and decommissioning. The information model incorporates several decades' worth of data; it includes over 10 million elements and NPP components and a wide range of other information.

The Multi-D system is continuously improved and upgraded by the team that has developed it in order to align it with the global best practices and the import substitution policy.

Effective use of information is a prerequisite for the Division's continued leadership on the global market.

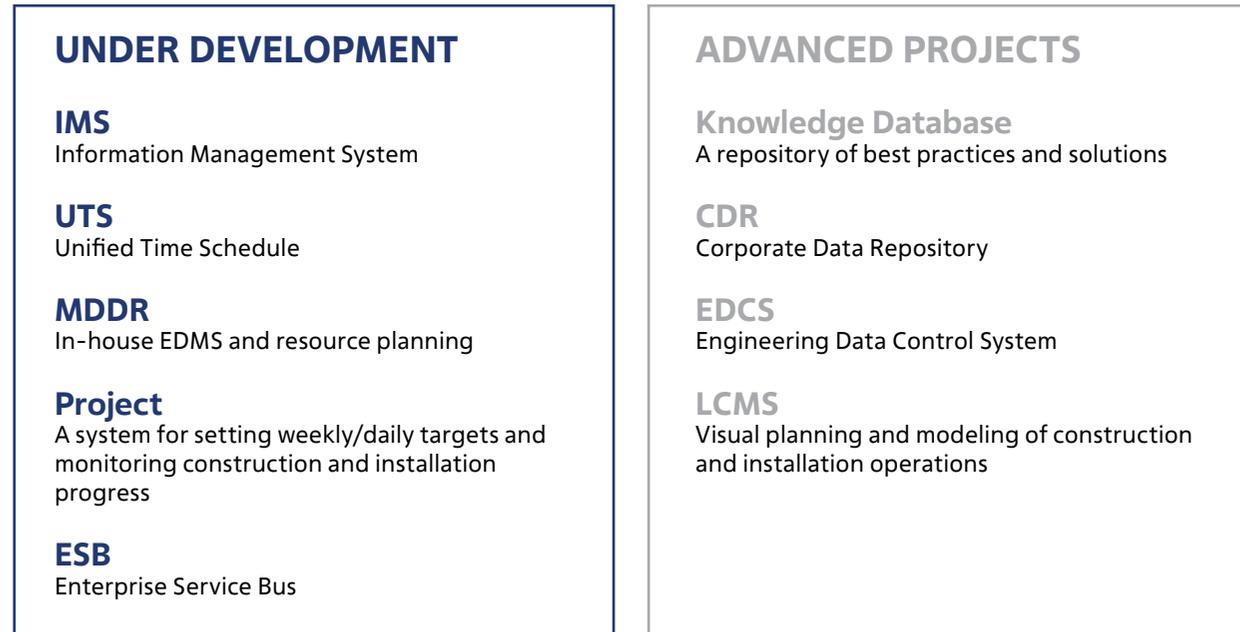
Digital transformation requires the application of both new technology and traditional IT approaches. That is why the IT function of the Engineering Division plays a central role in digitization and in shaping the company's digital architecture.

**IT TOOLS AND TECHNOLOGIES ARE INTRODUCED AND APPLIED AT ALL STAGES OF THE NPP LIFE CYCLE. THE DIVISION IS DEVELOPING THE FOLLOWING ADVANCED PROJECTS:**

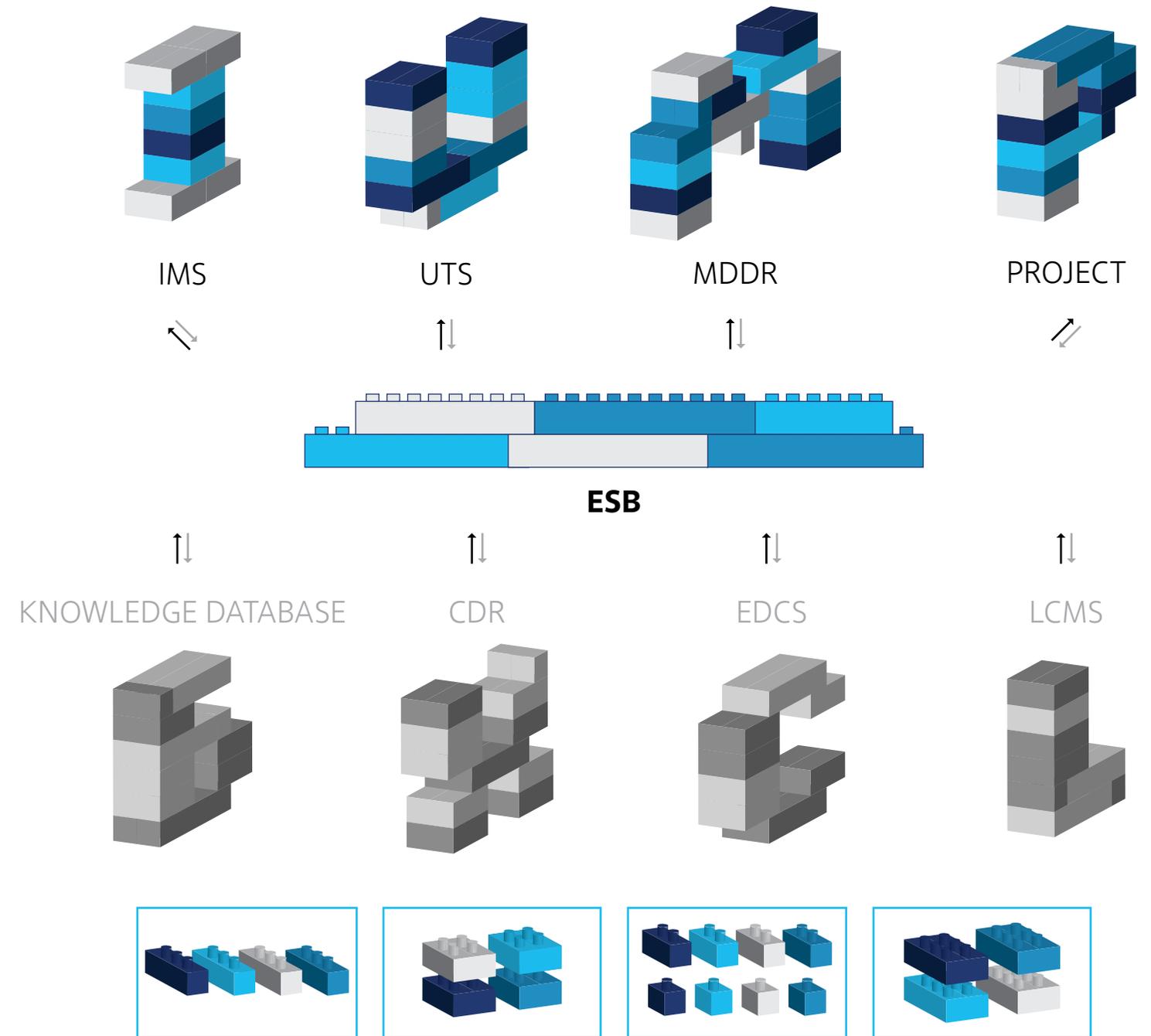
- The Knowledge Database (a repository of best practices and solutions);
- The CDR (corporate data repository);
- Remote monitoring of the NPP construction process using unmanned aerial vehicles;
- Monitoring of earthworks using unmanned aerial vehicles.

**BASIC ARCHITECTURE OF THE MULTI-D SOFTWARE PLATFORM**

**MULTI-D PLATFORM**



**MULTI-D PRODUCTS**



## 6.2. OUTCOMES OF KEY DIGITIZATION AND MULTI-D DEVELOPMENT PROJECTS IN 2019

1. Various configurations of the Multi-D platform were implemented and were successfully operated as part of NPP construction projects in Russia (Kursk NPP-2), Egypt (El Dabaa NPP), Hungary (Paks II NPP), India (Kudankulam NPP) and Bangladesh (Rooppur NPP).

2. A large-scale upgrade and modernization of computer equipment was completed.

3. Management of standard IT services was organized. A corporate IT standard was introduced to formalize all IT processes. To systematize and speed up all processes related to the procurement of IT equipment and IT services, a uniform procurement standard was developed.

4. Systematic steps were taken across the Division to manage the quality of IT services. The IT customer service was established to support incident management and IT service quality control. The timeliness and quality of processing of requests submitted to the IT Management System is monitored in order to improve the quality of IT services and the level of user satisfaction.

5. Proprietary processes were introduced in the company. Cross-functional teams of developers with a clear distribution of roles and responsibilities were established. A procedure was established for the management and implementation of projects involving in-house development of software and information systems. All existing Multi-D systems and tools are being integrated with each other to fully automate data transfer from one system to another.

6. An industry-wide NPP Construction Process Digitization programme was launched. The programme involves systematizing approaches to the digitization of the Division's business processes, including designing the first version of the target IT architecture of the Division, which will make it possible to avoid 'patchwork' automation. Tools for the

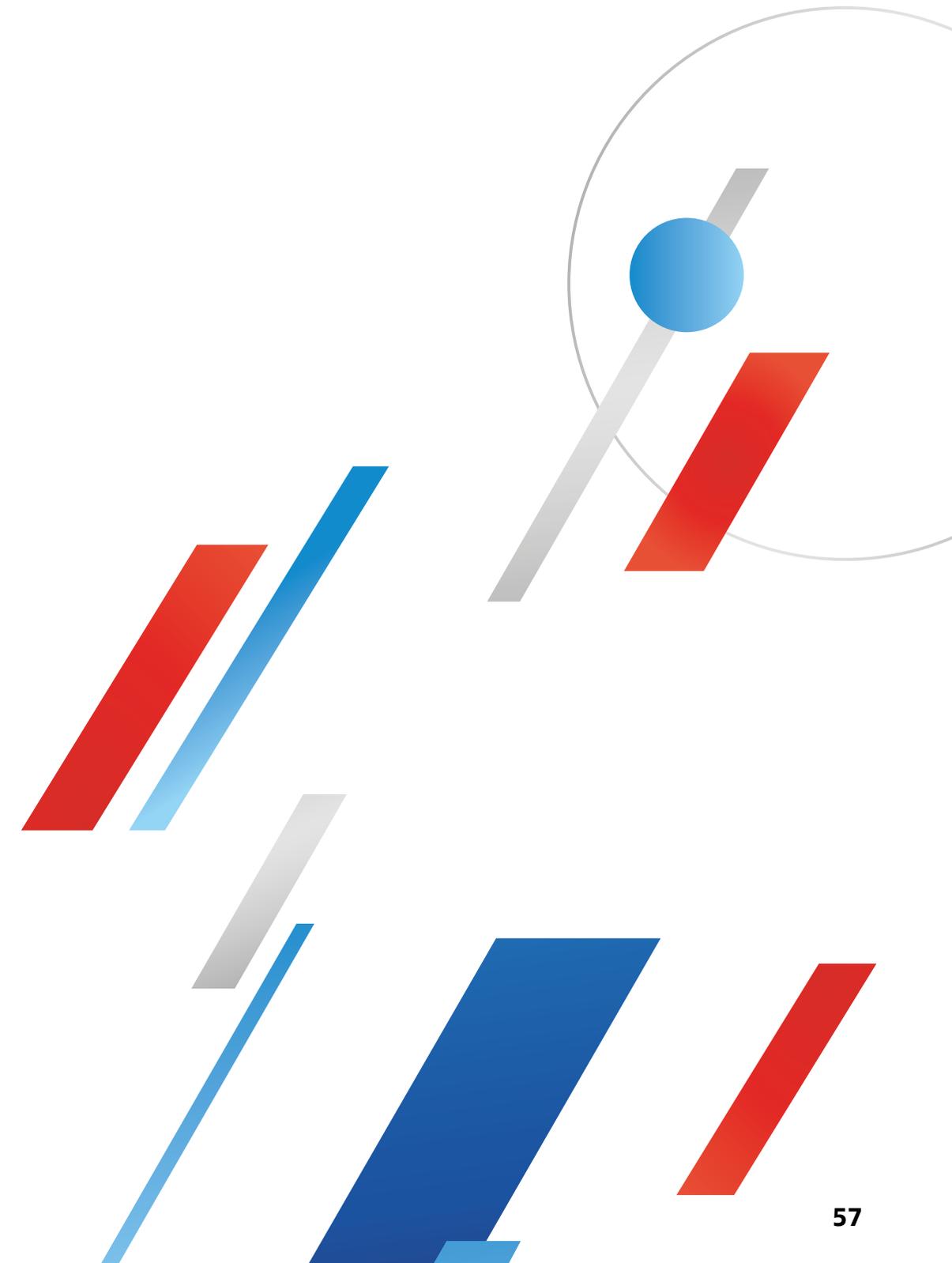
management of IT architecture were put into operation; a Committee on IT Solution Architecture of the Engineering Division was established; a methodology for managing the Division's IT architecture is being developed.

7. In October 2019, a process review and an audit of information systems were initiated in JSC ASE EC. The purpose of the review is to identify bottlenecks and double data entry during the application of information systems. Following the completion of the review, a work plan for the modification of the current architecture will be developed.

### PLANS FOR 2020

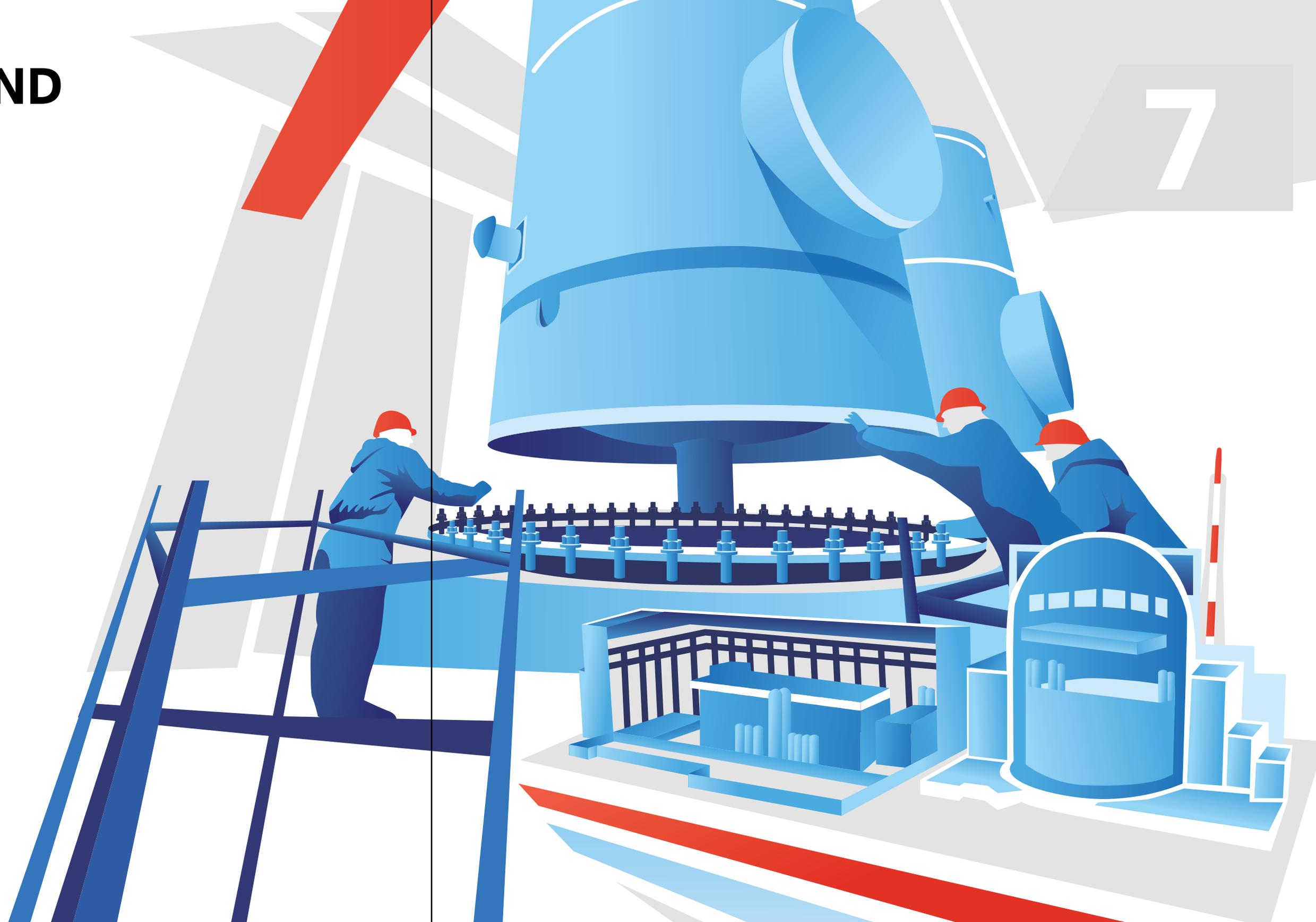
The Division plans to further develop in-house IT solutions, optimize processes and assign the responsibility for the management of IT functions in the Division, continue to upgrade equipment, redesign the internal portal, corporate services, accounting systems, procurement systems and other organizational processes.

As a result, the Division will be able to progress from addressing local problems to developing transparent information exchange within the Division and the industry, and with external customers.



# 7. INNOVATION AND DEVELOPMENT OF SCIENCE

7



As part of engineering analysis and optimization of design solutions, in 2019, the Division worked on the Paks II NPP project and the El Dabaa NPP project, carried out a number of R&D initiatives, including VVER-S, VVER-SKD and improvement of design solutions based on conventional VVER technology, developed a methodology and performed an audit of software used by the Joint Design Institute.

The key trend in the Division's patent policy is an expansion of the scope of patenting of identified protectable solutions in the form of inventions and utility models, and an increase in the number of international patents related to the implementation of overseas NPP construction projects. In 2019, 119 national and regional applications for inventions were submitted in more than 30 countries.

## RESULTS OF PATENTING AND REGISTRATION OF INTELLECTUAL PROPERTY ITEMS

Applications in Russia	2017	2018	2019
Patent applications submitted in Russia for inventions and utility models	21	26	16
Submitted applications for state registration of computer software and databases	12	7	2
International applications			
Submitted national and regional applications (30+ countries)	106	112	120
International applications submitted under the PCT (Patent Cooperation Treaty) procedure	10	6	1
Documents of title obtained by the Division			
Russian patents for inventions and utility models	5	15	24
Certificates for computer software and databases	26	12	2
Foreign patents, including decisions to issue patents	-	11	15

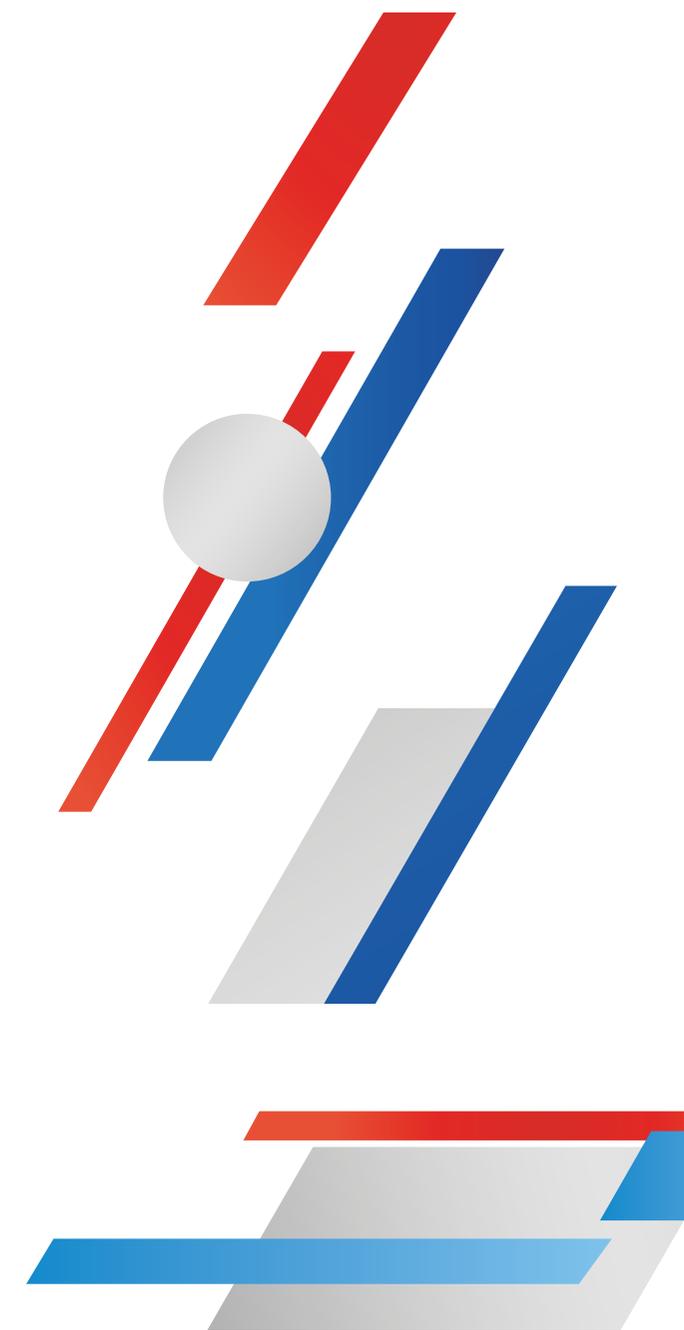
Between 2019 and 2022, the Division expects to obtain over 250 patents in foreign countries.

In 2019, the Engineering Division launched a project to develop a series of national standards for the location, survey and design of facilities that use nuclear energy for peaceful purposes. 45 proposals were submitted for the revision of existing and development of new standardization documents.

JSC ASE EC has established the Unified Scientific and Technical Research Council, a collective advisory body tasked with developing a single R&D policy of JSC ASE EC and supporting its implementation. This is an open platform for discussions involving the scientific and technical community in the enterprises of the Engineering Division, ROSATOM, third-party specialized organizations and regulators supervising nuclear and radiation safety. In 2019, the Council discussed the following topics:

- Resource management in NPP projects with VVER reactors;
- Standardization of design approaches;
- Use of equipment and technologies;
- Ensuring reliability during the performance of international contracts by ROSATOM.

In 2020, the Division plans to initiate projects to develop and update national standards for a compliance assessment system in the field of nuclear energy use, and to align Russian standards and rules with the IAEA, EUR and WENRA standards, the US NRC Regulatory Guides and ASME Codes.



# 8. DEVELOPING THE HUMAN CAPITAL



## 8.1. KEY PERSONNEL CHARACTERISTICS

The HR policy of the Engineering Division is aimed at fully unlocking talent, which is consistent with the strategic vision of ROSATOM.

The norms and rules of business communication in the Division are defined in the Code of Ethics and Professional Conduct for Employees. The Code explains the values and the principles of ethical behaviour which govern the relations between employees in the team and business partners. The Code serves as a tool for preventing potential violations and conflicts.

### TOTAL HEADCOUNT<sup>11</sup> IN THE ENGINEERING DIVISION IN 2019 WITH A BREAKDOWN BY GENDER AND AGE

Employee categories	TOTAL		Share of employees aged under 35	Under 30				Employee categories	30 to 50 years old			Over 50		
	target	actual		m	f	total			m	f	total	m	f	total
Executives	<b>2,250</b>	<b>2,399</b>	24.6%	161	22	<b>183</b>		Executives	1,168	373	<b>1,541</b>	483	192	<b>675</b>
Specialists	<b>11,521</b>	<b>11,408</b>	46.8%	1,482	1,311	<b>2,793</b>		Specialists	3,128	3,476	<b>6,604</b>	872	1,139	<b>2,011</b>
Other white-collar workers	<b>119</b>	<b>123</b>	44.7%	8	36	<b>44</b>		Other white-collar workers	0	45	<b>45</b>	2	32	<b>34</b>
Blue-collar workers	<b>10,474</b>	<b>12,686</b>	45.3%	3,230	104	<b>3,334</b>		Blue-collar workers	7,073	356	<b>7,429</b>	1,703	220	<b>1,923</b>
<b>Total</b>	<b>24,364</b>	<b>26,616</b>	<b>44.1%</b>	<b>4,881</b>	<b>1,473</b>	<b>6,354</b>		<b>Total</b>	<b>11,369</b>	<b>4,250</b>	<b>15,619</b>	<b>3,060</b>	<b>1,583</b>	<b>4,643</b>

<sup>11</sup> The total headcount means the number of employees on the payroll (with the Division as their main place of employment) at year end (excluding external part-time employees and employees under civil law contracts).

## PERSONNEL COMPOSITION

In 2019, the Engineering Division had a total of 26,616 employees. The Division continues to hire young specialists aged under 35: in 2019, they accounted for 44.1% of the total headcount in the Division (44.0% in 2018, 41% in 2017), and in some of the Division's enterprises, the share of young specialists reached 51%.

The Engineering Division actively recruits new employees. In 2019, the Joint Design Institute and the directorates of NPPs under construction hired 2,436 people to fill the vacancies offered by the holding company. Special emphasis is placed on internal promotion of employees. All employees appointed to the top 1,000 positions in 2019 were chosen from among candidates who had undergone training under talent pool development programmes.



**TOTAL HEADCOUNT IN THE ENGINEERING DIVISION IN 2019 WITH A BREAKDOWN BY TYPE OF EMPLOYMENT AND EMPLOYMENT CONTRACT**

Employee categories	Type of employment				Employment contract		Employee categories	Employment contract		Permanent/temporary			
	Full-time		Part-time		Fixed-term			Unlimited		Permanent employees		Temporary employees (under civil law contracts)	
	m	f	m	f	m	f		m	f	m	f	m	f
Executives	1,805	561	7	26	579	93	Executives	1,233	494	1,812	587	0	0
Specialists	5,371	5,234	111	692	1,310	1,214	Specialists	4,172	4,712	5,482	5,926	0	0
Other white-collar workers	10	107	0	6	3	33	Other white-collar workers	7	80	10	113	0	0
Blue-collar workers	11,983	646	23	34	8,550	369	Blue-collar workers	3,456	311	12,006	680	0	0
Other <sup>12</sup>	0	0	0	0	0	0	Other <sup>12</sup>	0	0	0	0	12	10
<b>Total</b>	<b>19,169</b>	<b>6,548</b>	<b>141</b>	<b>758</b>	<b>10,442</b>	<b>1,709</b>	<b>Total</b>	<b>8,868</b>	<b>5,597</b>	<b>19,310</b>	<b>7,306</b>	<b>12</b>	<b>10</b>

<sup>12</sup> The Other category includes employees working under civil law contracts.

## 8.2. OCCUPATIONAL SAFETY

The Engineering Division manages the construction of complex engineering facilities, which is characterized by special operating conditions and hazards, such as differences in elevation, operation of construction machinery, energized systems and equipment. Accordingly, the Division follows a systematic and responsible approach to occupational safety. The occupational safety and health management system covers employees both in the Division and in its subsidiaries and affiliates, as well as contractors and subcontractors.

The occupational safety and health management system in JSC ASE EC complies with the recommendations of the OHSAS 18001:2007 international standard.

At construction sites, occupational safety specialists develop Contractor Management Procedures governing the functioning of the occupational safety and health management system at the NPP construction site and establishing safety rules to be followed by employees. Contractors are responsible for ensuring the safety of their employees and construction sites in accordance with the concluded contracts.

Expenditure on occupational safety measures in the Engineering Division in 2019 totalled RUB 0.4 billion.

In 2019, 8,538 employees of the Engineering Division (managers, occupational safety and fire safety specialists) completed compulsory industry-wide and additional training programmes, with the number of employees provided with training almost doubling year on year.

In 2019, there were six accidents in the Engineering Division<sup>13</sup> (five of which resulted in severe injuries) and three accidents in contractor organizations (including one fatal accident). All the accidents were investigated; their causes were identified, and appropriate measures were taken.

Due to preventive measures taken to ensure occupational safety, in 2019, the Lost Time Injury Frequency Rate (LTIFR) stood at 0.06 (with the target for the Engineering Division, including its affiliates and subsidiaries, set at 0.32).

At the beginning of 2020, the Engineering Division adopted a Safety Culture Policy and appointed a management representative for safety culture and a safety culture coordinator. The provisions of the Policy are aligned with the safety culture requirements set out in IAEA GSR Part 2, GS-G-3.1 and GS-G-3.5.

The Engineering Division is developing a Safety Culture Standard to be applied in all its enterprises.

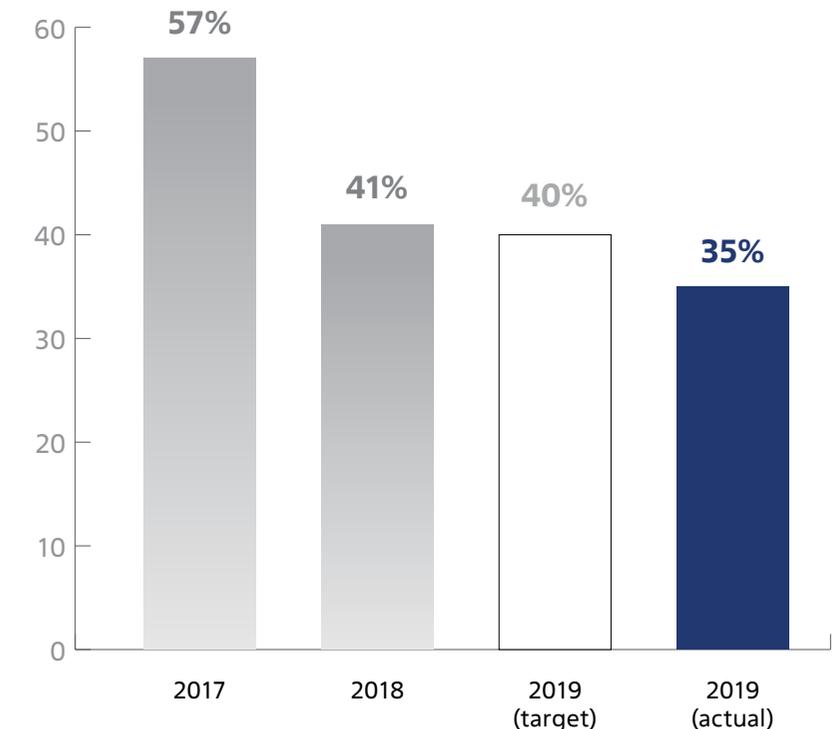
<sup>13</sup> The report provides information on all workplace accidents which occurred in the enterprises of the Engineering Division and contractor organizations in all NPP construction projects.

## 8.3. SOCIAL POLICY

The Division's social policy is aligned with the principles of the Uniform Industry-Wide Social Policy. Special emphasis is placed on social support, financial and non-financial incentives aimed at motivating employees to achieve results.

Collective agreements cover 35% of employees of the Division. A year-on-year decrease was due to an increase in the number of employees in subsidiaries which have not concluded collective agreements.

### SHARE OF EMPLOYEES OF THE ENGINEERING DIVISION COVERED BY COLLECTIVE AGREEMENTS



Social benefits provided by the Engineering Division include health insurance. Voluntary health insurance is arranged for all permanent employees, except for employees in subsidiaries, where decisions are made on a case-by-case basis taking into account the company's financial and economic performance.

In 2019, over 11,000 employees of companies in the Engineering Division were provided with voluntary health insurance; 17,000 employees were provided with insurance against accidents and diseases. The relevant expenses in 2019 totalled RUB 223 million.

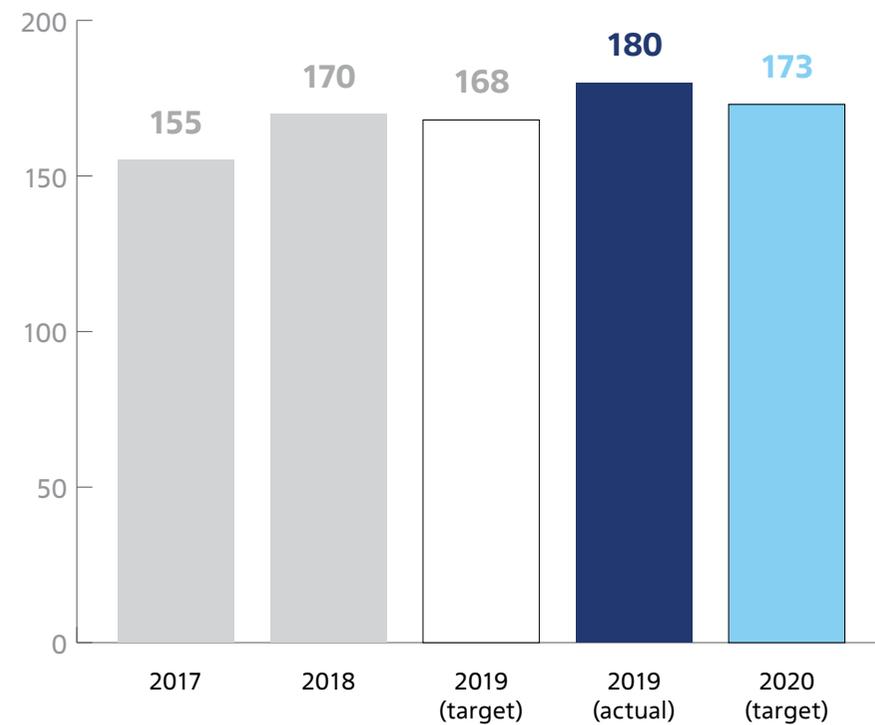
The Division arranges health resort treatment for employees, their children and retirees.

The Division provides financial support to employees in need. In 2019, financial support provided to employees totalled RUB 64 million.

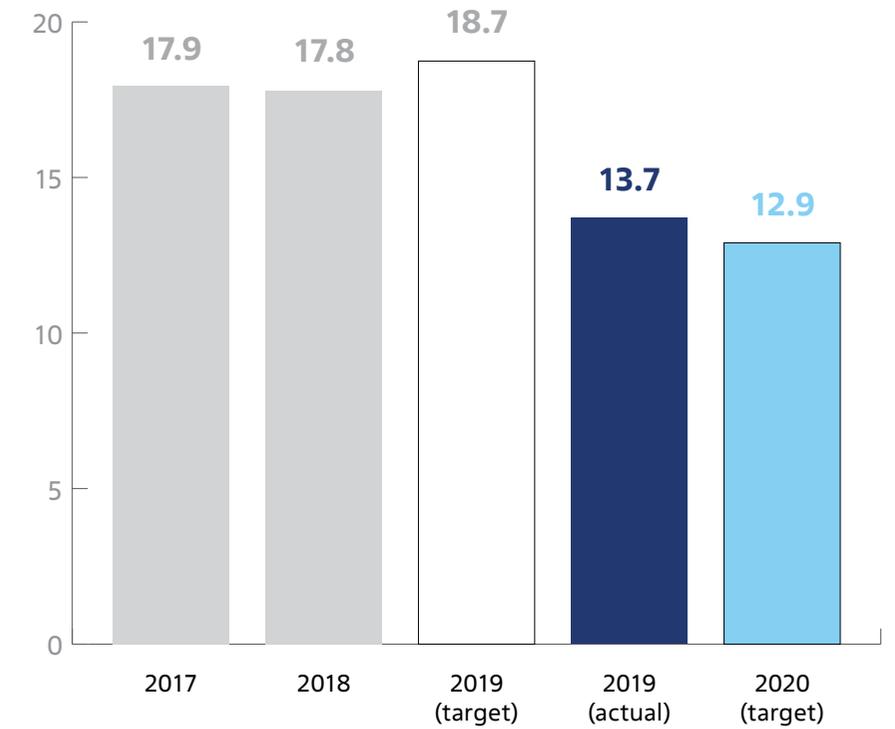
Every employee is entitled to join a private pension plan, subject to a number of conditions stipulated in the Regulation on Private Pension Plans. Pension savings under the programmes run by the Engineering Division are deposited in the Non-State Pension Fund Atomgarant. A reduction in the relevant expenses in 2019 was related to the resignation and retirement of a number of employees and the fact that employees with lower grades and salaries joined the programme.

### PRIVATE PENSION PLANS IN THE ENGINEERING DIVISION

### NUMBER OF EMPLOYEES PARTICIPATING IN PRIVATE PENSION PLANS, PERSONS



### EXPENDITURE ON PRIVATE PENSION PLANS, RUB MILLION



In December 2019, a number of measures were implemented in the People's Republic of Bangladesh to improve amenities provided to employees involved in the construction of Rooppur NPP.

Sports equipment for football, basketball, volleyball, table tennis and lawn tennis worth a total of RUB 11.4 million was purchased for the residential area.

In 2020, this project will continue. The construction of a multipurpose sports facility has been approved; it is expected to be commissioned in December 2020. The relevant expenses will total about RUB 30 million.

## 8.4. INTERNATIONAL COOPERATION IN THE FIELD OF EDUCATION, COOPERATION WITH UNIVERSITIES AND WORK WITH YOUNG PEOPLE, EMPLOYEE TRAINING

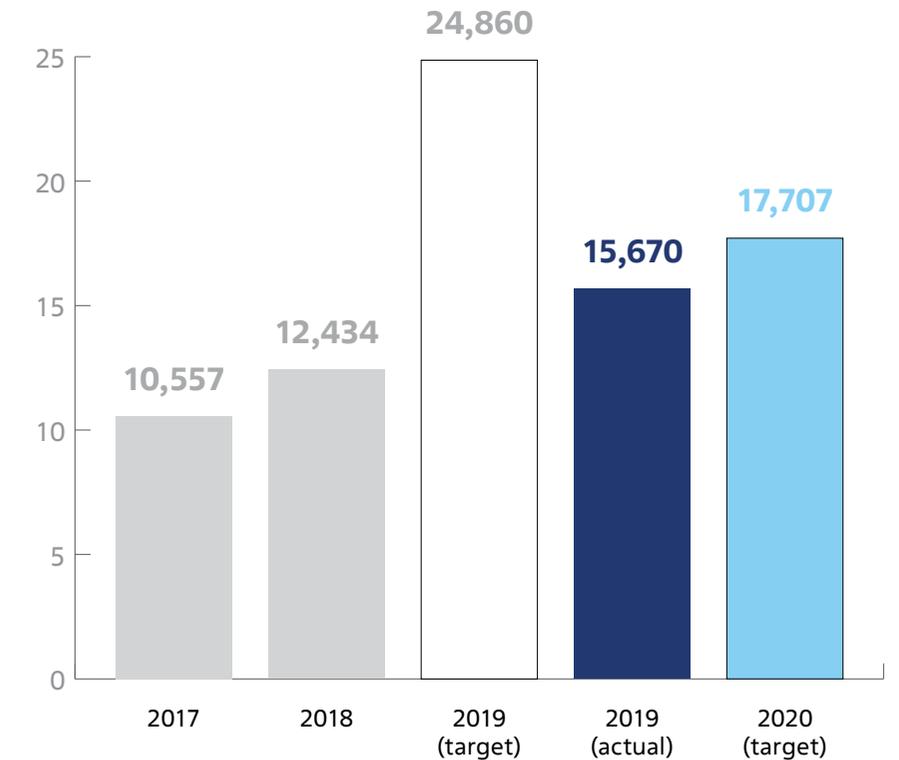
### EMPLOYEE TRAINING

The Division has adopted a holistic approach to employee training and development. It includes the development of professional and managerial skills, as well as digital skills and competences. The Division cooperates with ROSATOM's Corporate Academy to provide employees with both face-to-face and online training, with the focus gradually shifting towards the online format. In 2019, 20% of all training courses were run online.

The Engineering Division implements unique training programmes, such as an advanced training programme for NPP construction project managers and their successors. The programme is aimed at training specialists who implement complex EPC contracts.

**Every year, the Engineering Division sees an increase in the number of employees covered by corporate training programmes. More specifically, in 2019, the number of employees who completed at least one training course increased by 20.6% to 15,670.**

**NUMBER OF EMPLOYEES OF THE ENGINEERING DIVISION PROVIDED WITH TRAINING, PERSONS**



In 2019, an open competition titled 'Time to Build' was held for the first time. Its participants included both employees in the Engineering Division and the nuclear industry and managers with a track record in the construction of complex engineering facilities in other sectors of the Russian industry. Applications were submitted by 195 people, including 104 employees of the nuclear industry. Thirty-six people reached the final.

The finalists took part in a business game which involved solving cases based on real-life NPP construction problems; 12 people were declared winners. Ten of them received job offers from NPP construction project managers and were hired or got new appointments as part of projects in the Engineering Division.

**In 2019, the number of training hours per employee averaged 26 hours. A reduction in the number of training hours was related to mass training of workers and specialists in 2018 under compulsory training programmes that require repeated training in two or three years. In 2020, the uptrend in the average number of training hours is expected to continue due to extensive online training of employees and the launch of a training programme for managers.**

#### AVERAGE TRAINING HOURS PER EMPLOYEE OF THE ENGINEERING DIVISION, HOURS<sup>14</sup>

Employee categories	2017	2018	2019	2020 (target)
Executives	61.5	61.6	48.1	51.0
Specialists and white-collar workers	31.0	37.7	31.4	34.3
Blue-collar workers	19.7	26.9	17.3	21.1
<b>Total</b>	<b>30.9</b>	<b>34.2</b>	<b>26.0</b>	<b>28.5</b>

<sup>14</sup> The figures for 2017 and 2018 were recalculated due to the expansion of the scope of data consolidation for their calculation: previously, it had included JSC ASE EC, JSC ASE, JSC Atomenergoproekt, JSC ATOMPROEKT, JSC NIKIMT-Atomstroy, LLC Trest RosSEM and PJSC Energospetsmontazh; subsequently, the scope was expanded to include all companies managed by the Division, as shown in the Diagram of the Corporate Governance Structure of ROSATOM's Engineering Division as at December 31, 2019.

**The Division's expenditure on employee training in 2019 totalled RUB 276.8 million, with more than half of the amount made up by expenditure on additional training.**

#### EXPENDITURE ON EMPLOYEE TRAINING IN THE ENGINEERING DIVISION IN 2019

Type of training	Expenses, RUB million	Key partners
Compulsory professional training	51.7	ROSATOM's Technical Academy, Specialist Advanced Training Institute, Training Centre for Professional Development of Construction Workers in the Nuclear Industry, Russian Red Cross Society
Industry-wide training and development programmes	40.2	ROSATOM's Corporate Academy
Additional training	160.5	ROSATOM's Corporate Academy, ROSATOM's Technical Academy, Project Management University
Other training, development and assessment expenses	24.4	ROSATOM's Corporate Academy
<b>Total</b>	<b>276.8</b>	

## COOPERATION WITH UNIVERSITIES

The Engineering Division continues to cooperate with universities. Core and specialized universities satisfy over 70% of the company's total demand for young specialists. In 2019, the Engineering Division recruited 91 graduates from ROSATOM's core universities.

### NUMBER OF GRADUATES FROM CORE UNIVERSITIES HIRED BY THE DIVISION

Indicator	2017	2018	2019	Δ2019/2018, %	2020 (target)
Number of graduates from core universities, persons	56	59	91	+54	137
% of the average headcount	0.38	0.30	0.34	+13	0.51

A systematic reduction in the number of students taught in universities under targeted training programmes is related to reduced demand from the Division's companies for specialists who have completed these programmes.

In July 2019, a trilateral agreement on cooperation in personnel training was signed between JSC ASE EC, National Research Nuclear University MEPhI and the Ural Federal University named after the first President of Russia Boris Yeltsin.

## NUMBER OF STUDENTS STUDYING UNDER TARGETED TRAINING PROGRAMMES

Indicator	2017	2018	2019 (target)	2019 (actual)	Δ 2019/2018, %	2020 (target)
Number of students studying at universities and vocational colleges under targeted training programmes	86	78	62	49	-37.2	10
Number of students offered employment following the completion of training	1	12	13	13	+8.3	8

### JOINT MASTER'S DEGREE PROGRAMME AT HES MEPhI

In 2017, a joint two-year master's degree programme was launched by ASE and the Higher Engineering School of NRNU MEPhI (HES MEPhI). The programme is aimed at training specialists who have new competences in the field of digital engineering. In 2019, 30 people enrolled on the master's degree course at HES MEPhI.

Students of HES MEPhI start to participate in projects right after their enrolment on the master's degree course, which enables them to gain first-hand experience. By the time of their graduation, they become fully-fledged specialists with real work experience in the nuclear industry. Students do regular summer internship and receive weekly on-the-job training in JSC ASE EC. As part of their weekly practical work, student teams implement IT projects addressing practical tasks. In 2019, three projects were implemented by the first cohort of students enrolled on the master's degree course at HES MEPhI.

36 students did summer internship in JSC ASE EC in 2019, with 14 of them subsequently recruited by the company.

In 2019, 391 students did an internship in the Engineering Division, with 288 students on work placement and 103 students doing a pre-graduation internship. Following the internship, 59 people were recruited by the Division (up by 28% year on year).

## NUMBER OF STUDENTS DOING INTERNSHIP IN THE ENGINEERING DIVISION

Indicator	2017	2018	2019 (target)	2019 (actual)	Δ2019/2018, %	2020 (target)
Number of students who did an internship	329	388	390	391	+0.8	390
Number of students who were offered employment following the internship	41	46	50	59	+28.3	55

The Division's enterprises are actively involved in career guidance and career events: ROSATOM's Career Days, job fairs, the industry-wide TeMP Tournament for Young Professionals, the Youth Day as part of the ATOMEXPO 2019 exhibition and the #BrighterTogether Youth Day as part of the Russian Energy Week International Forum, which is a major event in the Russian energy industry, etc.

Young specialists in the Engineering Division's enterprises are actively involved in career guidance events in core universities. In 2019, over 20 events of this kind were held and were attended by more than 1,000 school and university students.

### WORKING WITH YOUNG PEOPLE

To implement the youth policy, encourage a proactive attitude to life among working young people and support the development and onboarding of young professionals, a Youth Council has been established in the Division. It functions on a free and voluntary basis.

Young people aged under 35 participate in defining prioritized focus areas of the Company's youth policy and social programmes. They offer their projects, initiate and hold innovative events (e.g. conferences, meetings, workshops for young people).

## INTERNATIONAL COOPERATION

In 2019, five graduates of NRNU MEPhI from the Socialist Republic of Vietnam, who had studied under the nuclear education export programme, did an internship at the Rooppur NPP construction site in Bangladesh. The internship was arranged under a memorandum signed in 2018 by ROSATOM and the Ministry of Education and Training of Vietnam.

In July and August 2019, over 400 senior students of specialized universities worked in students' construction teams at the sites of nuclear power units of Kursk NPP and Novovoronezh NPP-2 and at the Division's overseas construction sites in Bangladesh, Belarus and India. The students participated in construction and installation, finishing work and improvement of construction site areas.

25 students from international teams took part in a programme involving active participation in the operations of the Engineering Division's branches at overseas construction sites. As part of the Rooppur NPP construction project (Bangladesh) and the Kudankulam NPP construction project (India), the students assisted specialists with design supervision and monitoring of construction and installation progress. In addition, members of the student construction teams were involved in incoming inspection of equipment and issue of as-built documentation and studied the fundamentals of RPS Engineering in practice.

## 8.5. SUPPORT FOR VETERANS

The Division provides support to veterans jointly with the Veterans' Council and the Trade Union of the Engineering Division. Various events are organized annually to support retirees and honoured employees, who are especially important for the Division. They are provided with financial support (monthly payments, payments for surgeries), as well as bonuses to mark anniversaries, and reimbursement for the cost of health resort treatment.

In 2019, 530 veterans from Moscow and Nizhny Novgorod received financial assistance and took part in various events.

## 8.6. SPORTING EVENTS

In 2019, as part of the Year of Health, the Division held over 100 sporting events, including 25 mass events attended by over 800 employees, and over 120 cultural events. Health Days were regularly held in all of the Division's host towns and cities; in the summer, the Division organized open-air Family Days.

Employees of the Engineering Division participated in the Atomiada industry-wide sporting competition, the Friendship Festival organized by ROSATOM's regional enterprises and Nizhny Novgorod State Technical University, a sporting competition organized by trade unions among industrial enterprises in Nizhny Novgorod, the 8<sup>th</sup> National Cup of the Nuclear Industry, the basketball championship among men's teams of the Nizhny Novgorod Region, the regional hockey league championship, and a fitness day under the Ready for Labour and Defence National Sports and Fitness Programme.

# 9. DEVELOPING THE REGIONS OF OPERATION



## 9.1. INFRASTRUCTURE DEVELOPMENT

The Engineering Division's approaches to developing its regions of operation include the following:

- Creating a social and economic environment conducive to efficient implementation of industry projects and efficient use of ROSATOM's resources (business and non-business assets);
- Maintaining a talent pool;
- Preserving the historical social and cultural climate in nuclear towns and cities.

Construction of NPPs and power units involves not only additional investments in the regional economy, but also social improvements due to tax deductions and development of infrastructure (such as roads, bridges and other facilities), as well as new impetus for the development of science and technology and adoption of high technologies, training of highly skilled specialists, and education quality improvement.

Development of key infrastructure in the regions of operation can be exemplified by the establishment of centres for the training, professional development and certification of construction workers and specialists at the construction sites of Rooppur NPP and Kursk NPP. In 2020, investment budget totalling RUB 378.4 million will be allocated for the implementation of these projects.

The Division plans to build and equip training centres at the construction sites of Rooppur NPP and Kursk NPP to provide training in main construction occupations required to perform construction and installation operations, including welding, installation of electrical equipment and ventilation systems, reinforcement, rigging, etc.

Construction of training centres will enable the Division to provide NPP construction sites with workers that have the required qualifications, including workers recruited from local communities. The availability of such educational institutions has a positive impact on social infrastructure in the regions of operation of ROSATOM's Engineering Division.

## 9.2. SUPPORT FOR LOCAL COMMUNITIES

Efforts of enterprises in the Division aimed at supporting local communities are focused primarily on providing employment and fair salaries for the local population, communication and awareness-raising projects, as well as charity. A number of social programmes are implemented under co-operation agreements with regional administrations.

Construction of NPPs and new power units provides employment for thousands of local residents due to the development of the construction industry and businesses providing amenities, transportation and catering services to the personnel involved in the implementation of construction projects. In addition, local production for NPPs and procurement from local manufacturers help to create jobs in related sectors of the economy, including high-technology industries (the metals industry, machine engineering, etc.).

For instance, the construction of power units No. 6 and 7 of Novovoronezh NPP has provided about 1,500 new jobs for the residents of Novovoronezh. The construction of the Belarusian NPP has created over 3,000 new jobs both at the plant itself and in companies servicing it. The construction and operation of power units of Kudankulam NPP has provided more than 10,000 residents of the state of Tamil Nadu (India) with stable employment and fair working conditions. As part of the construction of Rooppur NPP in the People's Republic of Bangladesh, more than 40 local companies are engaged at the construction site, while the number of workers hired from the local community exceeds 7,000 people.

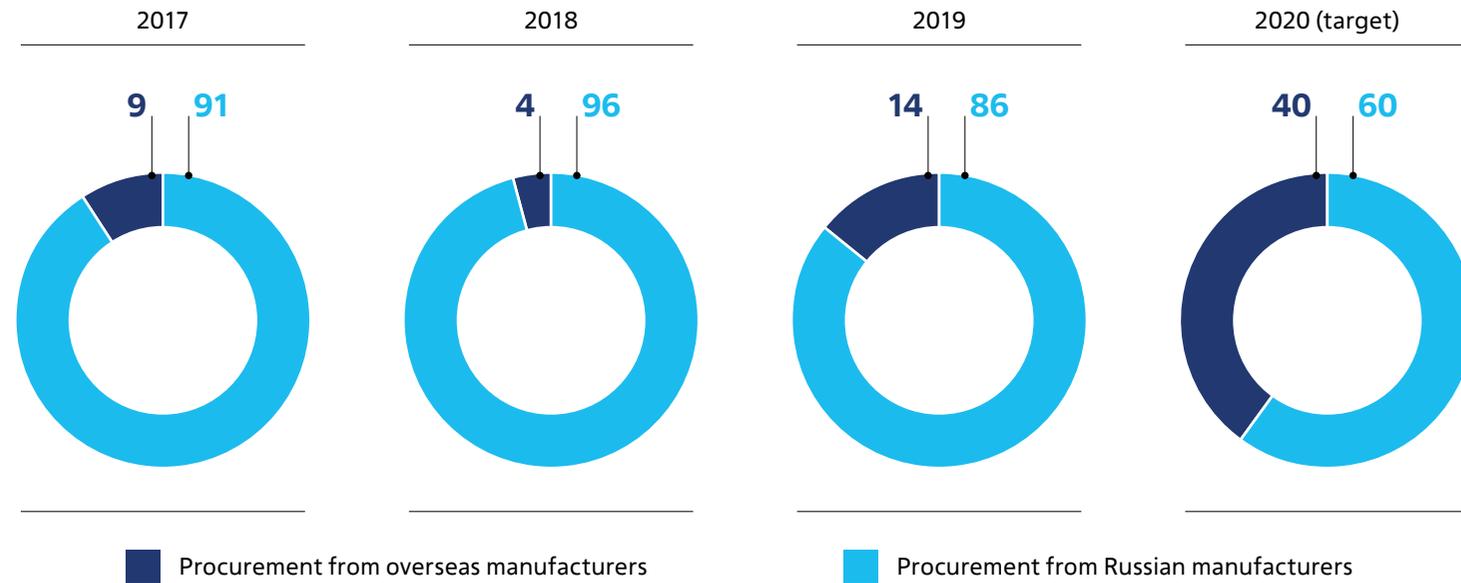
In 2019, 5,500 new jobs were created in the Engineering Division. An increase in the actual number against the target was mainly caused by the expansion of the scope of work performed by the Division at the construction sites of Kursk NPP and the Belarusian NPP.

The number of top managers in the Division's companies who were hired from local communities in the regions and countries of operation did not change in 2019 and totalled 73 persons, while their share increased from 64% to 65%.

Procurement of goods, work and services from small and medium-sized enterprises (SMEs) is regulated by Decree No. 1352 of the Government of the Russian Federation dated December 11, 2014 and the List of Goods, Work and Services to be Purchased from Small and Medium-Sized Enterprises approved by order of ROSATOM No. 1/137-P dated February 20, 2015.

Pursuant to the Decree of the Government of the Russian Federation, the minimum share of procurement from SMEs has been set at 20%. The Engineering Division's companies annually exceed this target three- to four-fold. In 2019, the value of procurement from SMEs exceeded RUB 13.9 billion. The main share of procurement from SMEs is made up by contracts for maintenance, repairs, components for multi-function printers (MFPs), and licences (28%), supply of MFPs and computers (15%), equipment and materials for repairs and construction (14%).

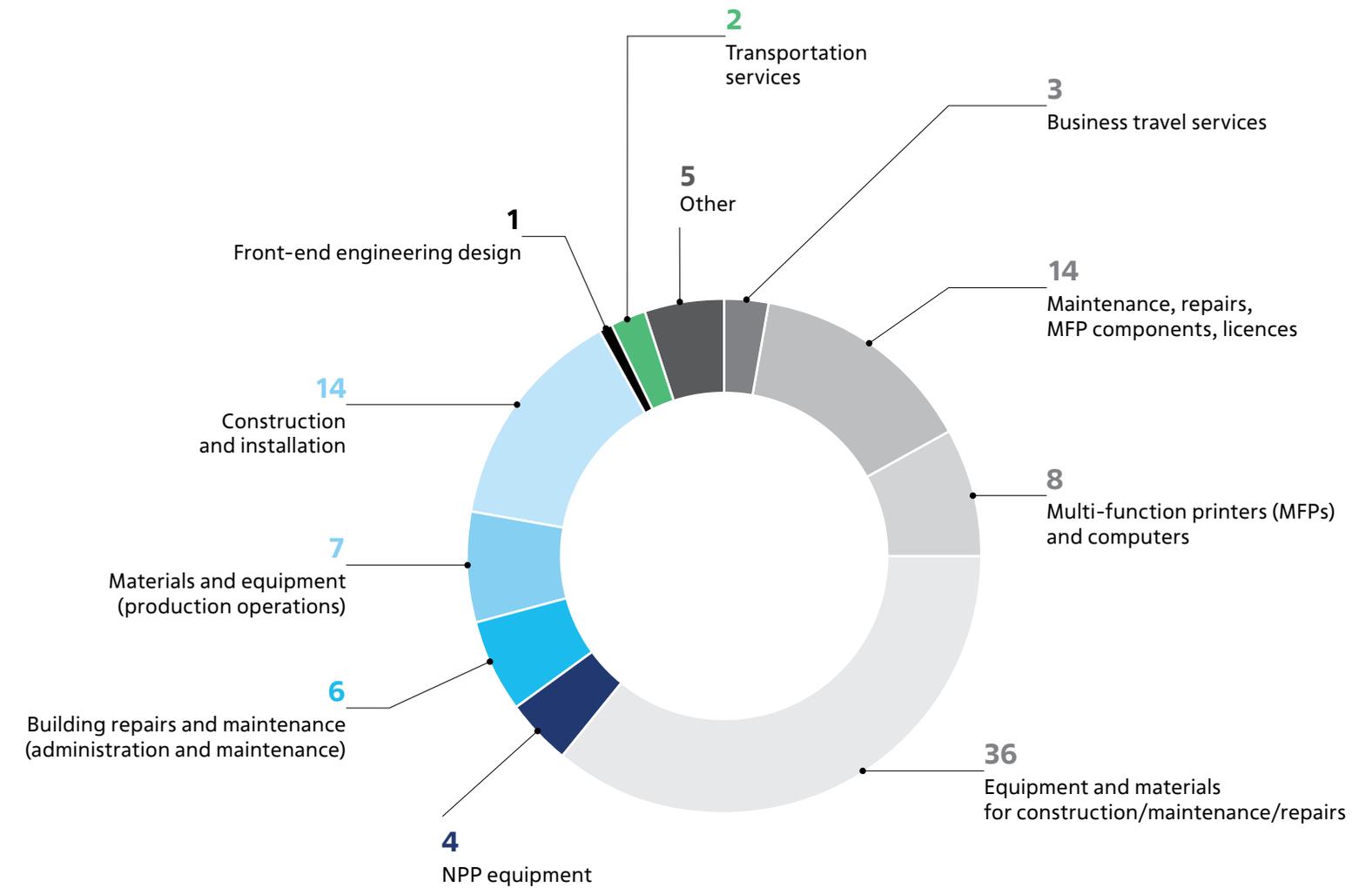
### SHARE OF NPP EQUIPMENT PROCUREMENT FROM RUSSIAN AND OVERSEAS MANUFACTURERS (BY THE VALUE OF CONCLUDED CONTRACTS), %



### SHARE OF PROCUREMENT FROM SMALL AND MEDIUM-SIZED ENTERPRISES, %

Company name	2017	2018	2019
JSC ASE EC	92	99	90
JSC ASE	97	66	85
JSC Atomenergoproekt	76	91	80
JSC ATOMPROMKT	100	67	61
JSC NIKIMT-Atomstroy	58	58	76
PJSC Energospetsmontazh	38	93	75
LLC Trest RosSEM	-	-	28

### PROCUREMENT FROM SMALL AND MEDIUM-SIZED ENTERPRISES IN 2019



## 9.3. VOLUNTEER PROJECTS

In 2019, a total of more than 300 employees of the Engineering Division were involved in volunteer initiatives.

**Volunteers work in all regions of operation of the Engineering Division. They run campaigns to help orphanages, retirement homes and veterans of the Great Patriotic War, and implement environmental projects.**

### KEY PROJECTS IN 2019:

#### ■ New Life (January).

A blood donation campaign aimed at compiling the National Register of Bone Marrow Donors was held in the office of JSC ASE EC, with 62 employees participating in the campaign.

#### ■ Young Volunteers of the 21<sup>st</sup> Century (May).

Volunteers in the Nizhny Novgorod Branch Office of JSC Atomenergoproekt provided assistance free of charge to 18 families in need, a church, a school and a community centre. 103 employees participated in the project.

## 9.4. CHARITY PROJECTS

### COMPETITION OF CHARITY PROJECTS

In 2019, JSC ASE EC held the annual competition of charity projects for non-profit organizations for the sixth time. The competition includes the following categories: The Young Generation; Environment; Culture and Sports; Patriotic Initiatives; and The Future Lies with Science, a new category added in 2019 and designed to support non-profit organizations conducting research in science and technology, promoting scientific achievements, including in the nuclear industry, and holding events to present the latest scientific achievements to the general public, including children.

### A UNIQUE BASKETBALL COURT

On September 3, 2019, a new sports facility was opened on the premises of gymnasium No. 1 in Ostrovets (Republic of Belarus): a state-of-the-art basketball court built with support and assistance from ROSATOM, JSC Rosenergoatom, the Republican Unitary Enterprise Belarusian Nuclear Power Plant and the Ostrovets District Executive Committee. This event is important not only for the Grodno region, but also for the entire Republic of Belarus.

A training system for young basketball players will be introduced in the town; the system will cover different age groups, from kindergarteners to high school graduates.

### THE COMPETITION WINNERS IN 2019 INCLUDE:

■ Municipal Education Institution Gervyaty Secondary School (Republic of Belarus) with a project to establish a museum of civic and patriotic education, spiritual and moral upbringing of the youth;

■ Volgodonsk Municipal Foundation for Family and Childhood Support named after Nikolay Burdyugov with a project titled 'Wings: a Theatre of Unlimited Opportunities', which enables children with special needs to attend classes at a drama school and take part in theatrical productions.

**In 2019, JSC ASE EC allocated RUB 574.9 million for charity.**

## 9.5. COMMUNICATION WITH EXTERNAL STAKEHOLDERS

The communication policy of the Engineering Division is designed to encourage a constructive dialogue and gain the trust of all stakeholders. Its objective is to build up the reputation of ROSATOM as a technological leader and a steadily developing company. Measures taken by the Division help to improve brand recognition on the regional and national level, to win public acceptance for nuclear power among local communities and to promote Russian nuclear technologies by highlighting their safety and reliability.

The Division's companies communicate with the following stakeholders: shareholders, regulatory and supervisory authorities, international organizations and associations, local governments and local communities in the regions of operation, consumers of technologies, products and services, financial institutions and representatives of the investment community, the scientific community, educational institutions, rating agencies, market analysts, non-governmental organizations (including environmental NGOs), the expert and professional community, and the media.

One of the forms of stakeholder engagement is public reporting, which involves holding dialogues, public consultations on the draft report of ROSATOM and its public assurance. Detailed information on stakeholder engagement mechanisms and key stakeholder interests is provided in section 2.6.1. 'Stakeholder Engagement' of the Annual Report of the Engineering Division for 2018. Detailed information on management approaches is also disclosed in the Annual Report of the Engineering Division for 2018.

## KEY COMMUNICATION EVENTS IN 2019

Communication project/event	Participation format, outcome
Information projects	
<b>Coverage of the commissioning of power unit No. 2 of Novovoronezh NPP-2</b>	<p>Materials were published in a special issue of the <i>ASE Bulletin</i> corporate newspaper.</p> <p>A poster was printed featuring portraits of specialists who had made a particularly important contribution to the construction of the power unit.</p> <p>Information was published on the company's websites, and wall newspapers were printed.</p> <p>An electronic version of an album dedicated to the completion of construction of Novovoronezh NPP-2 (archive photos covering the period from 2007 through 2019) was created.</p>
<b>Discussion 'Search for the Green Square' (March, Minsk)</b>	<p>Representatives of the Engineering Division took part in the discussion of challenges facing Belarus in the context of global warming and measures that need to be taken immediately to mitigate the consequences of climate change. The event also included the screening of the first <i>Wild Edens</i> film, which forms part of a joint project of ROSATOM and National Geographic.</p> <p>About 50 experts from the Ministry of Energy, the State Committee for Standardization, the Belarusian State University, as well as industry experts, scientists, ecologists and representatives of leading Belarusian media outlets took part in the discussion.</p>

Communication project/event	Participation format, outcome
<b>Organization and coverage of a working visit of the Hungarian delegation to the Belarusian NPP (June, Minsk, Ostrovets)</b>	<p>During the visit, Hungarian specialists led by Mr. János Süli, the minister supervising the construction and commissioning of Paks II NPP units, reviewed progress on the construction of the Belarusian NPP and held a working meeting with executives of the Engineering Division. The guests were shown the Belarusian experience in creating infrastructure for construction workers and NPP service personnel in Ostrovets, where the Division is taking active steps to build housing, amenities and recreational facilities.</p> <p>Following the visit, an interview with Mr. Süli was aired on Radio TRO (the Television and Radio Broadcasting Organization of the Union State of Belarus and Russia), and press releases were published on the portals of the Belta information agency, Minsk News and other leading Belarusian media outlets.</p>
<b>Visit of media representatives and bloggers from the Kursk Region to the office of JSC Atomstroyexport</b>	More than 20 media representatives and bloggers from the Kursk Region visited the office of JSC Atomstroyexport and asked questions of concern regarding NPP construction and safe operation.

### Educational projects

<b>AtomDvizh ('AtomMove') interactive show programme (June, Minsk)</b>	The project was implemented as part of the 2 <sup>nd</sup> European Games held in Belarus. The entertainment programme incorporated fun facts on technologies and scientific achievements of the Russian nuclear industry. The event was attended by more than 3,500 people.
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Communication project/event	Participation format, outcome
<b>Educational projects</b>	
<b>Construction DNA interactive programme (August, Ostrovets)</b>	<p>The programme was implemented as a pilot project to mark a professional holiday (the Construction Worker's Day) in the form of a town festival, which included entertaining games, sporting competitions, educational shows and workshops, where every visitor could imagine themselves as an NPP builder and learn the basics of design and engineering.</p> <p>The festival was attended by more than 4,000 people. Representatives of the Belarusian media were invited to take part in the event and were offered a chance to view new facilities forming part of the town's infrastructure: a school, a kindergarten, a sports centre and a hospital. These facilities were built in Ostrovets in response to its rapid growth driven by the construction of the Belarusian NPP.</p>
<b>Sounds of a Construction Site engineering and acoustic open-air event (September, Minsk)</b>	<p>The project was implemented as part of the Scifest scientific festival in partnership with the National Academy of Science of the Republic of Belarus.</p> <p>The visitors could test their knowledge in the field of nuclear technologies in a game format, see a popular science show involving Tesla coil demonstration, take part in intellectual and outdoor games. The event was attended by 4,500 people.</p>
<b>Coverage and organizational support of the NUCKIDS 2019 industry-wide project</b>	<p>The Division posted information about the start of selection of participants and progress on the project, assisted in holding the qualifying round and supported the participation of employees' children in the selection process (one child of an employee of JSC ASE EC was selected to participate in the project).</p> <p>Steps were taken to support the participation of overseas representatives (children) from Bangladesh, Egypt, India and China in NUCKIDS 2019. Media coverage of the children's participation in the project was provided in China, Bangladesh, India and Egypt.</p> <p>Rehearsals of a production titled <i>A Winter Fairy Tale</i> were held on the premises of JSC ASE.</p>

Communication project/event	Participation format, outcome
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Internal corporate events

**Publication of the ASE Bulletin newspaper**

*ASE Bulletin* is a corporate newspaper published by the Engineering Division and containing 10 to 14 A3 pages. It is sent in electronic form to all corporate email addresses in the Division. The newspaper contains news, reviews, interviews and other relevant materials forming part of the internal corporate agenda. In 2019, there were 12 issues of *ASE Bulletin*.

**Art Delivered to the Office Project**

During the year, exhibitions of paintings and photographs were held at four venues in the Nizhny Novgorod Branch Office of JSC ASE EC and were made available to both the company's employees and visitors. A total of 12 exhibitions were held, each attended by more than 1,000 people.

**Internal corporate project to mark the Construction Worker's Day**

A project to improve employee engagement in the Division's subsidiaries and affiliates was implemented at three sites: Kursk NPP-2, Rooppur NPP and the Belarusian NPP.

The following activities were organized as part of the project:

- A series of concerts, *On a Workday Noon*, with a programme based on requests from employees of construction companies;
- Design and printing of posters featuring portraits of the best workers;
- Publication of a special issue of the corporate newspaper, *Construction Site Bulletin*;
- Production of souvenirs for the Kursk NPP-2 site;
- Design and construction of an installation titled *We Are Building the Future* in Kurchatov.

Communication project/event	Participation format, outcome
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Internal corporate events

**Coverage of industry-wide professional contests**

Coverage of contests (The Best Expert in the Nuclear Construction Industry 2019, AtomSkills 2019, WorldSkills Hi-Tech 2019) on websites, on social media, in the Division's corporate newspaper and the *Strana ROSATOM* newspaper, in the wall newspaper.

**Coverage and internal corporate support of the celebration of the 90<sup>th</sup> anniversary of the Saint Petersburg Design Institute (JSC ATOMPROEKT)**

- Production of a documentary on the history of the institute and its landmark projects;
- Supplying printed products and souvenirs for events forming part of the celebration;
- Coverage of internal corporate events during the anniversary year (publications of news stories and interviews in corporate and industry media), media coverage of the celebration.

**Year of Health Project**

Coverage of the sports games organized by trade unions and industry-wide competitions: reports by the Nizhny Novgorod State Television and Radio Broadcasting Company, coverage on websites, on social media, in the corporate newspaper and the wall newspaper.

About 100 people took part in the Anti-AIDS campaign held in the Nizhny Novgorod Branch Office of JSC ASE EC.

Communication project/event	Participation format, outcome
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International communication projects

**Participation in the organization and holding of a Fishing Festival at Leningrad NPP attended by foreign media representatives and ecologists from the countries developing the nuclear power industry based on Russian technologies (Bangladesh, Hungary, Egypt, India, Turkey and Finland)**

As part of the Festival, Russian and foreign media representatives and ecologists from the countries developing the nuclear power industry based on Russian technologies (Bangladesh, Hungary, Egypt, India, Turkey and Finland) learned about the special features of Russian technological solutions ensuring the safety and efficiency of NPPs equipped with RBMK and VVER reactor units (a visit to Leningrad NPP) and the Multi-D innovative technology, visited Russian cultural and historical centres, and became familiar with Russian traditions and cuisine.

**ASE International Photo Awards 2019 international photojournalism competition (January – August)**

Over 100 photographs from the Republic of Belarus, Bangladesh, Hungary, India and Egypt were submitted for the competition.

Following the competition, the best works were exhibited in Moscow (JSC ASE EC office), Nizhny Novgorod (JSC ASE EC office), Minsk (NEIC) and Dhaka (NEIC). A catalogue of the works was published. A special section was created on the ASE website, where a gallery of the top 24 photographs was published.

All participants were awarded diplomas. A tour to Moscow was arranged for the winners.

The competition received wide coverage in the Belarusian and Bangladeshi media.

**Organization and holding of a media tour of Paks NPP (Hungary) for journalists representing leading Belarusian media outlets**

More than 10 representatives of the leading Belarusian media outlets visited Paks NPP and the construction site of Paks II NPP.

The programme of the tour included a press conference attended by the management of JSC ASE EC, where plans for further cooperation on the Paks II NPP project were presented.

Communication project/event	Participation format, outcome
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International communication projects

**Media coverage of the 8<sup>th</sup> International Scientific and Practical Conference for Young Scientists and Specialists KOMANDA organized by the Engineering Division**

Over 300 participants from 15 countries discussed topics relevant to the industry, such as increasing the share on the Russian market amid digital transformation of the industry, the talent pipeline, etc., during the four-day KOMANDA ('Team') conference organized by the Youth Society of JSC ATOMPROM.

Following the conference, news reports were published in the corporate and industry media and on social media, including foreign websites. A video covering all days of the conference was created, and a collection of abstracts was published.

**International media tour of the Belarusian NPP (October, Ostrovets)**

An international media tour of the Belarusian NPP was organized and held as part of the Belarusian Energy and Ecology Forum, Exhibition and Congress 'Energy. Ecology. Energy Saving. Electro'.

The event was attended by more than 50 reporters from Turkey, Egypt, Poland, Lithuania, Uzbekistan and Russia. Following the event, there were more than 70 publications in the Belarusian media, 15 in Egypt, 7 in Turkey, 4 in Uzbekistan, 15 in Bangladesh, 13 in Poland and Lithuania.

**Launch of the web page of the Public Counselling Office of Rooppur NPP in the Bengali language**

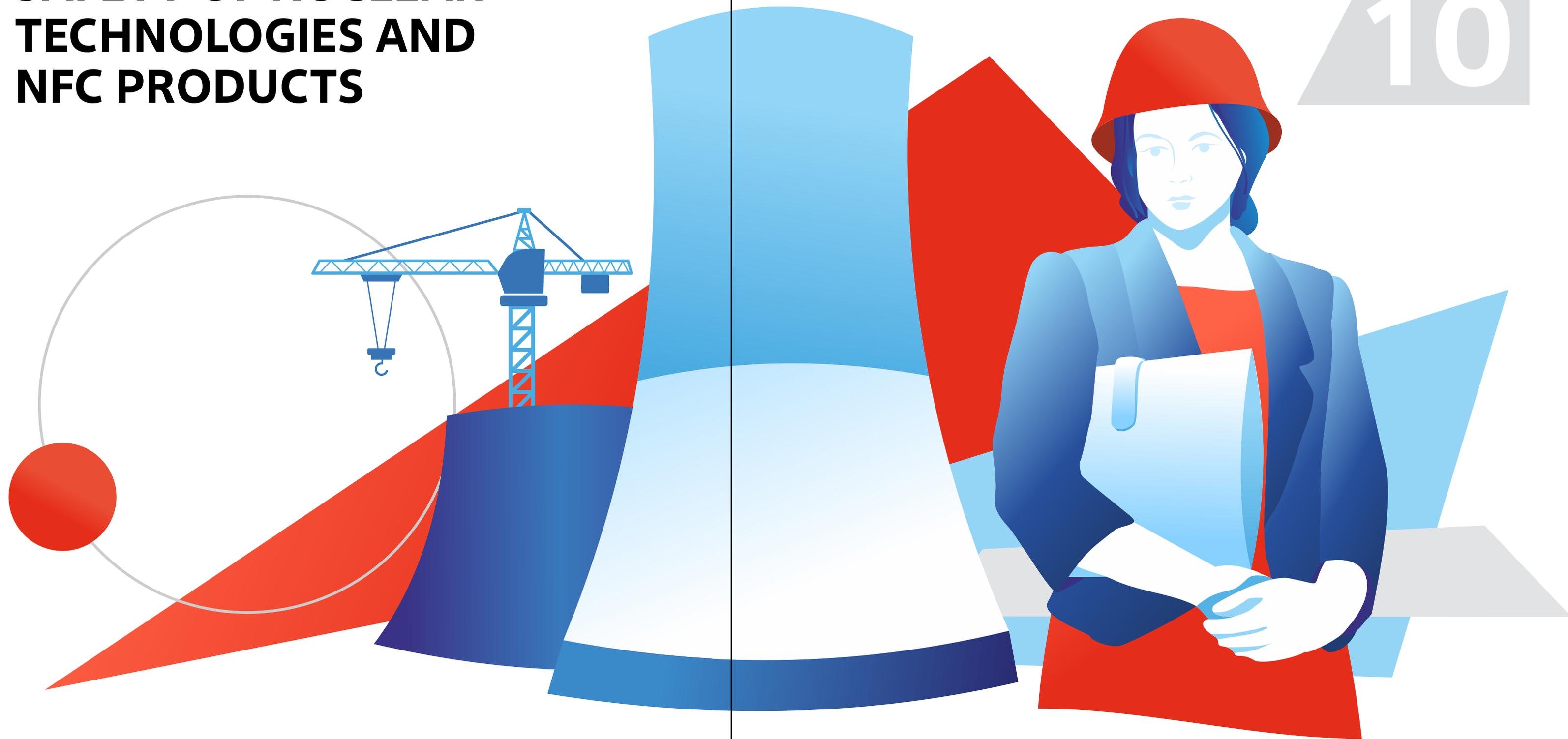
A virtual Public Counselling Office was opened at <https://bdnuclear.energy/> to inform the population about the progress in the construction of Rooppur NPP and about the nuclear industry in general, enable the local community to ask questions related to nuclear power, and to announce scientific, awareness-raising, social and cultural events organized by the Division in the region.

**Official website of the Engineering Division: [www.ase-ec.ru](http://www.ase-ec.ru)**

**Pages on social media:**  
[www.vk.com/aserussia](http://www.vk.com/aserussia)  
[www.facebook.com/aserussia](http://www.facebook.com/aserussia)  
[www.instagram.com/aserussia](http://www.instagram.com/aserussia)

# 10. SAFETY OF NUCLEAR TECHNOLOGIES AND NFC PRODUCTS

10



The main objective of NPP design and construction by the Engineering Division is to ensure safe NPP operation.

The safety of NPP designs developed by the specialists of ROSATOM's Engineering Division is underpinned by a globally acknowledged principle of defence-in-depth, which is based on the use of a barrier system designed to protect the population against ionizing radiation and radioactive leaks into the environment and a system of technical measures to maintain the efficiency of these barriers.

The safety concept used in the designs under development is aligned with the current requirements and recommendations of the IAEA, INSAG and EUR. A distinguishing feature of NPP designs is a combination and optimal use of active and passive safety systems, with a special focus on ensuring the independence of systems used at different defence-in-depth levels.

### OVERALL, THE ENGINEERING DIVISION'S COMPANIES OPERATED SAFELY IN THE REPORTING YEAR:

- There were no accidents or incidents posing a threat to the life or health of employees or a direct threat of an accident at hazardous industrial facilities in the Russian Federation;
- There were no fires or instances of ignition;
- There were no instances of unscheduled personnel radiation exposure exceeding 20 mSv;
- The levels of radioactive emissions and discharges into the environment were significantly lower than the established limits;
- There were no events rated at level 2 or higher on the international INES scale.

## EVOLUTION OF NPP DESIGNS WITH VVER REACTORS

### VVER-1200

The NPP design with a VVER-1200 reactor is characterized by improved technical and economic performance and fully meets the IAEA requirements, the European Utility Requirements for LWR Nuclear Power Plants (EUR) and post-Fukushima requirements of the Western European Nuclear Regulators' Association (WENRA).

**The main advantage is a higher level of resilience of power units to external impacts and internal failures. The safety systems and barriers used as part of this design prevent radioactive leaks into the environment and provide physical protection against natural disasters, man-made accidents and other emergencies.**

**The design provides protection for an NPP against a powerful earthquake (magnitude 7 on the MSK-64 scale), a plane crash, a flood and a tsunami.**

### VVER-TOI

**VVER-TOI is the next stage in the evolution of NPP designs with VVER reactors.** It builds on technical solutions forming part of NPP design with a VVER-1200 reactor. **A range of features of the reference NPP design with a VVER-1200 reactor has been optimized to make it competitive on the global market in terms of both technical and economic performance. This has involved optimizing the lead time (40 months for NPP construction), reducing construction costs by 20% and operating costs by 10% compared to the previous-generation design.** The optimization includes changes to the layout of steam generators in the reactor unit, changes in the configuration of NPP buildings and structures, a reduction in the footprint area, etc. **The service life of power units has been extended to 60 years.**

**The VVER-TOI design incorporates a range of additional measures to ensure seismic resistance and safety in case of hypothetical severe accidents.**

In addition, a power unit with a VVER-TOI reactor can operate on MOX fuel without any adjustments<sup>15</sup>.

**In 2019, the VVER-TOI design was recognized as meeting the EUR requirements.**

<sup>15</sup> More details about MOX fuel are provided on the website of ROSATOM's Fuel Division at <https://tvel.ru/activity/nuclear-products/nuclear-fuel/new-fuel/>

## 10.1. INDUSTRIAL SAFETY

Industrial safety measures in the Engineering Division comply with Federal Law of the Russian Federation No. 116-FZ of July 21, 1997 on Industrial Safety of Hazardous Industrial Facilities, regulatory requirements of the Russian Federation, the Uniform Industry-Wide Policy of ROSATOM on Industrial Safety and the Uniform Industry-Wide Guidelines on the Establishment of an Industrial Safety Management System in ROSATOM's Organizations. JSC ASE EC adopted a policy on industrial safety in 2016.

The majority of hazardous industrial facilities (HIFs) operated by the Division's companies are hazard class 4 facilities (96%), while the remaining HIFs are hazard class 3 facilities. There are no class 1 or 2 hazardous industrial facilities in the Division.

There were no events classified as an accident at a hazardous industrial facility between 2017 and 2019.

### THE FOLLOWING MEASURES WERE TAKEN IN THE DIVISION'S COMPANIES IN 2019:

- Certification of responsible specialists in the field of industrial safety; testing the knowledge of personnel operating the HIFs;
- Audit of compliance with industrial safety requirements as part of industrial monitoring and internal safety control;
- Technical certification of equipment operated by the companies; inspections of reference measuring instruments, safety devices and mechanisms;
- Compulsory civil liability insurance arranged by the HIF owners against damage caused by an accident.

## 10.2. FIRE SAFETY

Pursuant to fire safety regulations, in the reporting period the Division held refresher and unscheduled fire safety briefings for all its employees, as well as evacuation drills for the personnel working in high-occupancy buildings. In the spring and autumn, the technical condition of external fire-fighting water supply systems was inspected by territorial bodies of the EMERCOM of Russia.

There were no fires or instances of ignition at the Engineering Division's facilities in 2019.

## 10.3. NUCLEAR AND RADIATION SAFETY

Nuclear and radiation safety measures in the Engineering Division comply with Federal Law of the Russian Federation No. 170-FZ of November 21, 1995 on the Use of Nuclear Energy, regulatory requirements of the Russian Federation and the Uniform Industry-Wide Policy of ROSATOM on Nuclear Safety.

Radioactive sources are operated in strict compliance with regulatory requirements for the use of nuclear facilities.

In order to operate sources of ionizing radiation, the Division has obtained licences for operations involving the use of nuclear energy from the nuclear safety regulator.

Persons responsible for ensuring radiation safety, accounting and monitoring and physical protection of radioactive substances have been appointed and have undergone training and certification making them eligible to perform work involving the use of nuclear energy.

Persons who are authorized to work with ionizing radiation sources have undergone a medical examination to confirm that there are no contraindications on health grounds; they have undergone training in safe work practices, have passed an examination in order to obtain authorization to work with sources of ionizing radiation and have received a safety briefing. Individual radiation exposure is monitored and recorded.

Industrial radiation monitoring is performed in accordance with the radiation monitoring programme approved by the Federal Biomedical Agency (FMBA) of Russia.

In 2019, the general inspectorate of JSC ASE EC carried out the following targeted inspections to ensure nuclear and radiation safety:

- Rooppur NPP (two inspections);
- The Belarusian NPP (two inspections);

- Kursk NPP-2 (two inspections);
- The Directorate for the Management of Nuclear and Radioactive Materials of JSC ASE, Moscow (one inspection).

As part of professional development in the sphere of nuclear safety, in 2019, members of the general inspectorate of JSC ASE EC underwent training in ROSATOM's Technical Academy under a Professional Development Programme for Inspectors of ROSATOM's Enterprises and Organizations and were issued with the relevant certificates.

**In 2019, there were no events rated at level 2 or higher on the international INES scale in the Engineering Division of ROSATOM.**

In 2019, there were no accidents, incidents or anomalies during the operation of radiation sources and no radioactive emissions or discharges into the environment in the Engineering Division. Reference values approved by the Federal Biomedical Agency for main dose limits, limits on nuclide intake, contamination of air, indoor surfaces, workplaces and equipment during the work with radiation sources were not exceeded.

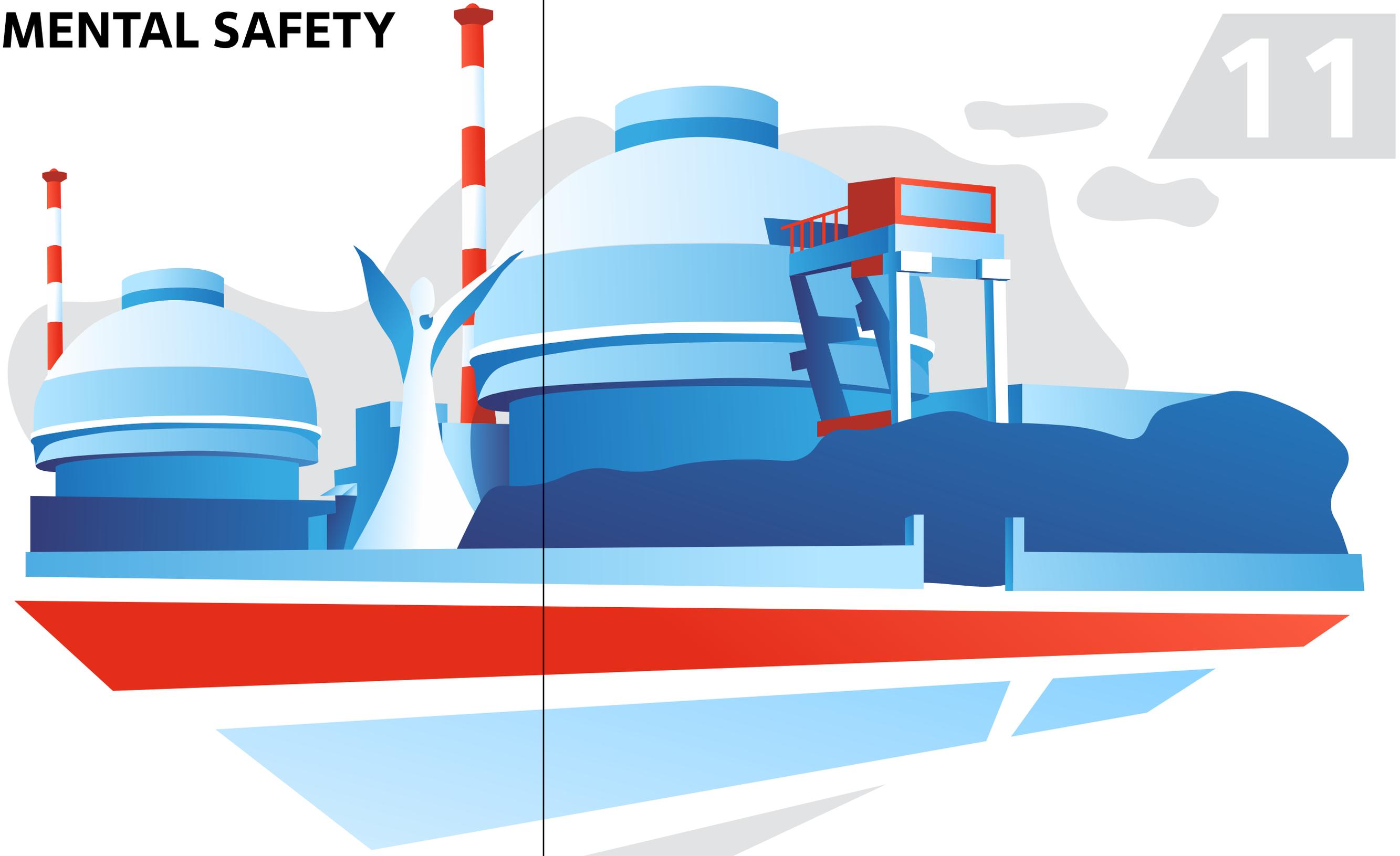
### NPP RADIATION IMPACT ASSESSMENT

Forecasts made for NPPs designed by the Division suggest that radiation exposure of the population and the environment during normal operation, potential deviations in operation and design basis accidents will not exceed the established exposure limits. Radiation exposure of the population and the environment remains below the established regulatory limits.

During normal NPP operation, gas and aerosol emissions from the ventilation stack are the main source of radionuclide emissions into the environment. Engineering and technical solutions forming part of the designs developed by the Division ensure that emissions of radionuclides are below permitted levels stipulated in sanitary rules for NPP design and operation (SP AS-03). Actual annual emissions of radionuclides from operating NPPs are comparable to those from European NPPs and are negligibly low.

Maximum total exposure of the population to radionuclides produced during NPP operation is less than 0.02% of the dose received from naturally occurring radionuclides. Radiation exposure of the critical components of terrestrial and aquatic ecosystems during NPP operation is fifty or more times lower than the safe level.

# 11. ENVIRONMENTAL SAFETY



## MANAGEMENT SYSTEM<sup>16</sup>

Responsibility for ensuring compliance with legislation on environmental protection and environmental safety is stipulated in internal organizational and administrative documents of the companies forming part of the Engineering Division.

At construction sites, including overseas, responsibility for compliance with environmental requirements is assigned to executives of separate business units (directors of branches/representative offices).

**Environmental management systems (EMS) are in place in JSC ASE EC, JSC ASE, JSC ATOMPROEKT, JSC NIKIMT-Atomstroy, PJSC Energospetsmontazh and LLC Trest RosSEM. They comply with the ISO 14001:2015 international standard, which is confirmed by the relevant certificates.**

Each of the above companies has approved a policy reflecting their commitments and activities, including in the sphere of environmental protection. As part of their efforts to ensure compliance with the ISO 14001:2015 standard, the companies identify environmental aspects and assess their significance, set environmental goals and develop measures for their achievement. The policies of the Division's companies include a commitment to protect the environment and prevent the negative environmental impact.

## ENVIRONMENTAL MONITORING

Industrial environmental monitoring in the Engineering Division's companies is carried out in accordance with industrial environmental monitoring programmes and covers all facilities under construction and in operation that are classified as category 2 (1 facility) and 3 (12 facilities) facilities making a negative impact on the environment. The Division has no category 1 facilities making a negative impact on the environment.

**Major achievements of the reporting period include the absence of fines or criticisms from environmental regulators and the absence of complaints from Customers under NPP construction projects regarding compliance with environmental requirements, reduction of pollutant emissions into the atmosphere, an increase in environmental expenses and personnel training in the field of environmental safety.**

## CHARGES FOR THE NEGATIVE ENVIRONMENTAL IMPACT

Charges imposed on companies in the Engineering Division for the negative environmental impact (environmental charges) decreased by 9% in 2019 and totalled RUB 1,342,100 (including water tax). The reduction in environmental charges was caused by amendments to environmental legislation regarding payment for the disposal of solid municipal waste (SMW): starting from 2019, the relevant payments are made by regional SMW management operators.



### CHARGES IMPOSED ON THE ENGINEERING DIVISION FOR THE NEGATIVE ENVIRONMENTAL IMPACT, RUB '000

Type of environmental charges and natural resource taxes	2017	2018	2019	Δ 2019/2018, %
For waste disposal	2,772.62	1,401.19	1,276.57	-8.9
For pollutant emissions into the atmosphere from stationary pollution sources	13.99	21.97	3.88	-82.3
For pollutant discharges into water bodies	1,274.00	55.00	57.35	+4.3
Water tax	3.92	2.50	4.30	+72.3
Other natural resource taxes	0.00	0.00	0.00	-
<b>Total</b>	<b>4,064.53</b>	<b>1,480.66</b>	<b>1,342.10</b>	<b>-9.4</b>

<sup>16</sup> The section discloses information on the environmental impact of facilities under construction in the Russian Federation and overseas construction sites where the direct environmental impact is made by companies of the Engineering Division.

# 11.1. MEASURES TO IMPROVE ENERGY EFFICIENCY

The Engineering Division uses energy resources mainly for operational needs, provision of amenities and heating.

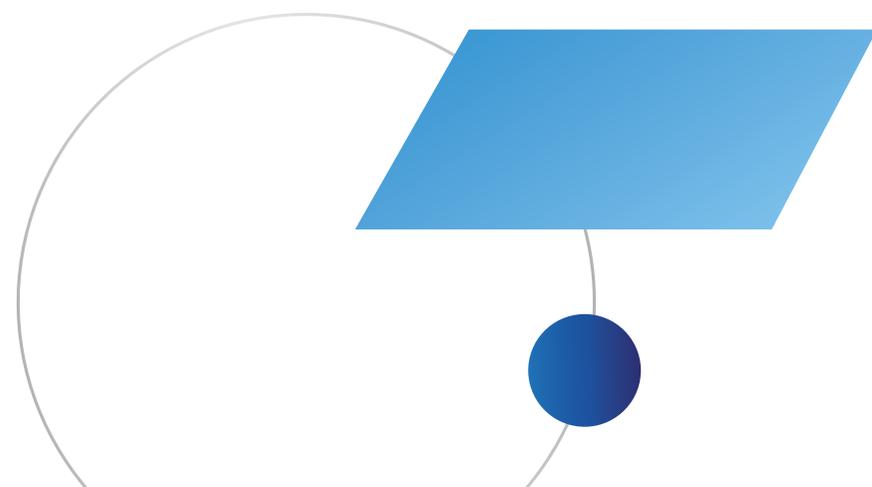
The Division recorded the following amounts and year-on-year changes in energy consumption in 2019:

- 90.668 million kWh for electricity (up by 70.6%);
- 113,566 GJ for heat (down by 8.1%).

The increase in electricity consumption was caused mainly by a change in the reporting procedure for the Belarusian NPP construction site (excluding subcontractors) and JSC Atomenergoproekt (including branch offices), as well as an increase in energy consumption by PJSC Energospetsmontazh (at the Belarusian NPP construction site and in the People's Republic of Bangladesh).

An increase in electricity and heat costs was related to a rise in energy prices in 2019.

An increase in the cost of gasoline, diesel fuel and coal was caused by a rise in fuel prices. A decrease in the cost of natural gas was caused by a reduction of its consumption in 2019 compared to 2018.



## CONSUMPTION OF ENERGY RESOURCES<sup>17</sup> IN THE ENGINEERING DIVISION<sup>18</sup>

Type of resources	Consumption/cost of resources							
	2017		2018		2019		Δ 2019/2018, % (in physical terms)	Δ 2019/2018, % (in monetary terms)
	GJ or kWh	RUB million	GJ or kWh	RUB million	GJ or kWh	RUB million		
<b>Electricity (kWh), including consumption:</b>	<b>35,379,182.01</b>	<b>194.37</b>	<b>53,145,610.02</b>	<b>357.93</b>	<b>90,668,530.58</b>	<b>754.46</b>	<b>+70.6</b>	<b>+110.8</b>
for operational needs and amenities	25,309,837.31	146.87	40,548,600.54	263.76	78,216,410.58	674.56	+92.9	+155.8
for the operation of electrical equipment as part of industrial processes	9,315,925.70	43.86	11,882,834.78	66.71	10,851,109.35	70.69	-8.9	+6.0
for the operation of electric motors	753,419.00	3.65	714,174.70	27.46	1,601,010.65	9.22	+124.2	-66.4
<b>Heat (GJ), including consumption:</b>	<b>118,043.94</b>	<b>65.63</b>	<b>123,582.41</b>	<b>84.80</b>	<b>113,566.18</b>	<b>88.90</b>	<b>-8.1</b>	<b>+4.8</b>
for heating	48,687.57	30.39	54,150.25	38.24	46,733.39	48.85	-13.7	+27.8
for process needs	357.3	0.52	39.60	0.06	2,203.89	0.80	+5,465.4	+1,230.0
for hot water supply	1,824.01	0.93	1,995.77	5.25	3,626.49	2.56	+81.7	-51.2
other	67,175.06	33.79	67,396.79	41.25	61,002.41	36.69	-9.5	-11.1

<sup>17</sup> For all companies forming part of the Engineering Division that have a direct contract with a service provider.

<sup>18</sup> Data for 2017 and 2018 provided earlier in the public annual reports of the Engineering Division for 2016-2018 has been recalculated due to the exclusion of data on subcontractors of the Representative Office of JSC ASE in the Republic of Belarus, the revision of data on construction branches of JSC NIKIMT-Atomstroy and the revision of data on JSC Atomenergoproekt.

## FUEL TYPES USED IN THE ENGINEERING DIVISION<sup>19</sup>

Fuel type	Fuel consumption/cost							
	2017		2018		2019		Δ 2019/2018, % (in physical terms)	Δ 2019/2018, % (in monetary terms)
	tonnes	RUB million	tonnes	RUB million	tonnes	RUB million		
Motor gasoline	1,206.51	50.55	1,062.36	53.77	1,313.29	67.30	+23.6	+25.2
Diesel fuel	1,317.34	51.54	2,032.90	97.36	3,267.88	165.91	+60.8	+70.4
Fuel oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-
Natural gas	1,276.93	9.77	1,329.18	10.66	1,203.62	8.33	-9.5	-21.9
Coal	124.00	0.61	119.00	0.73	164.00	0.94	+37.8	+28.8
Other	-	-	-	-	-	-	-	-
<b>Total</b>	<b>3,924.78</b>	<b>112.47</b>	<b>4,543.44</b>	<b>162.52</b>	<b>5,948.79</b>	<b>242.48</b>	<b>+30.9</b>	<b>+49.2</b>

<sup>19</sup> Data for 2017 and 2018 provided earlier in the public annual reports for 2017 and 2018 has been recalculated due to:

- The exclusion of data on LLC VDMU, LLC Construction and Installation Directorate No. 1 and Energy Surveys JSC;
- Closure/opening of branch offices of LLC Trest RosSEM;
- The revision of data on the Branch Office of JSC ASE in the People's Republic of Bangladesh and JSC NIKIMT-Atomstroy for 2017 and 2018.

## 11.2. WATER USE

The negative impact on water resources during NPP construction is insignificant. The Engineering Division's companies use water resources to supply amenities with water for drinking and sanitary purposes, carry out hydraulic tests at NPPs under construction, mix concrete, fill the pipelines of NPP cooling systems, for flushing during pre-commissioning and for other process purposes. Water is withdrawn mainly from surface water bodies.

Water withdrawal in 2019 totalled 607,500 m<sup>3</sup>. A significant increase in water withdrawal from surface water bodies in 2019 was related to the fact that the construction of the Belarusian NPP entered the final stage and hydraulic testing was carried out.

Domestic wastewater and stormwater runoff from the Engineering Division are mainly discharged into municipal sewerage systems under contracts. In 2019, the total volume of discharge increased by 20.6% year on year to 13,152,320 m<sup>3</sup>.

In 2019, the Baltic Branch Office of JSC ASE EC ceased to discharge wastewater into a water body due to the handover of wastewater treatment facilities and the Baltic NPP construction site to a branch office of JSC Rosenergoatom.

## TOTAL WATER CONSUMPTION IN THE ENGINEERING DIVISION<sup>20</sup>, '000 M<sup>3</sup>

List of water sources <sup>21</sup>	Name of water source	Water consumption, '000 m <sup>3</sup>			
		2017	2018	2019	Δ (2019-2018)/2018, %
Surface water bodies, including swamps, rivers, lakes and oceans	River Viliya (RUE Belarusian NPP)	27.60	76.92	329.67	+328.6
Groundwater	Well at the Lesnoy Uyut recreation centre, Gervyaty stage II pumping station (RUE Belarus NPP)	82.24	144.40	163.92	+13.5
Municipal and other water supply systems	JSC Nizhegorodsky Vodokanal, Mezofoldviz, reservoirs on the Moskva and Vazuza Rivers and the Volga (surface water sources); Northern Water Treatment Station of JSC Mosvodokanal, SUE Vodokanal of St. Petersburg, MUE Balakovo-Vodokanal; Volgograd Gorvodokanal; MUE Desnogorsk Public Utility; MUE GTS; MUE Vodokanal; MUE Aquaservice, MUE Vodokanal (Obninsk), JSC Seversk Vodokanal	111.23	107.55	113.93	+5.9
<b>Total</b>		<b>221.07</b>	<b>328.87</b>	<b>607.52</b>	<b>+84.7</b>

<sup>20</sup> Data for 2017 and 2018 provided earlier in the public annual reports for 2017 and 2018 has been recalculated due to:

- The exclusion of data on LLC VDMU, LLC Construction and Installation Directorate No. 1 and Energy Surveys JSC;
- The revision of information on water consumption by the Representative Office of JSC ASE EC in the Republic of Belarus in 2017 and 2018.

Data has been provided on facilities located in the Russian Federation, the Republic of Belarus and Hungary, except for facilities located in the Kursk Region. As regards other overseas projects and sites located in the Kursk Region, no information has been provided due to the nature of construction stages and contractual relations.

<sup>21</sup> Between 2017 and 2019, the Division did not use seawater, water produced as a by-product, rainwater, or wastewater from other organizations.

## TOTAL WASTEWATER DISCHARGE IN THE ENGINEERING DIVISION<sup>22</sup>, '000 M<sup>3</sup>

Type of destination of water discharge	Name of destination of water discharge	Wastewater discharge, '000 m <sup>3</sup>			
		2017	2018	2019	Δ (2019-2018)/2018, %
Surface water bodies, including swamps, rivers, lakes and oceans	River Seym (CHER/DNEPR/892/360), River Viliya (RUE Belarusian NPP)	7,529.06	10,601.18	12,853.39	+21.2
Groundwater	-	-	-	-	-
Seas	-	-	-	-	-
Other destinations and water supplied for reuse to other organizations	JSC Nizhegorodsky Vodokanal, MUE Sokol Housing and Utility Infrastructure, RUE Belarusian NPP, L-komfort, JSC Mosvodokanal, SUE Mosvodostok, combined sewerage system of SUE Vodokanal of St. Petersburg, MUE Balakovo-Vodokanal; Volgograd Gorvodokanal; MUE Desnogorsk Public Utility; MUE GTS; MUE Vodokanal; MUE Aquaservice, MUE Vodokanal (Obninsk), JSC Seversk Vodokanal	262.92	301.86	298.93	-1.0
<b>Total</b>		<b>7,791.98</b>	<b>10,903.04</b>	<b>13,152.32</b>	<b>+20.6</b>

<sup>22</sup> Information on wastewater discharge by branches of JSC NIKIMT-Atomstroy in 2017 and the Representative Office of JSC ASE EC in Belarus in 2017 and 2018 has been revised.

Data has been provided on facilities located in the Russian Federation, the Republic of Belarus and Hungary. Information on other overseas projects has not been provided due to the nature of legislative requirements and contractual relations.

## 11.3. INDUSTRIAL AND CONSUMER WASTE MANAGEMENT

A significant negative environmental impact is associated with waste generation at NPP construction sites.

Industrial and consumer waste generated by facilities built and operated by the Engineering Division is managed in accordance with the environmental legislation of the Russian Federation and the Division's countries of operation.

All facilities built and operated by the Engineering Division have waste storage sites. As they are filled, waste is handed over to specialized organizations for further transportation, disposal, decontamination and storage under a licence for the collection, transportation, handling, disposal, decontamination and storage of hazard class 1 to 4 waste (valid in the Russian Federation).

The Division uses two waste disposal methods in its countries of operation. In the first case, waste is handed over directly to organizations providing waste transportation, decontamination, disposal and recycling services under contracts. The second option involves transferring waste to the owners of office premises leased by the Engineering Division's companies, or to Customers. The owners and Customers transfer waste received from the Division for further handling in accordance with the law of the countries of operation.

In 2019, waste generation increased by 155% compared to 2018 and totalled 14,216.81 tonnes. Low-hazard waste (hazard class 4) and practically non-hazardous waste (hazard class 5) accounted for 54.7% and 34.0% respectively of the total volume of waste. The increase in waste generation was related to rapid progress on the construction of Kursk NPP-2 and Rooppur NPP and the completion of work at power unit No. 2 of Novovoronezh NPP-2.

### VOLUME OF WASTE IN THE ENGINEERING DIVISION BY HAZARD CLASS<sup>23</sup>, TONNES

Waste generation by hazard class and processing method	2017	2018	2019	Δ 2019/2018, %
Hazard class 1 waste (extremely hazardous)	2.96	2.57	2.64	+2.7
Hazard class 2 waste (highly hazardous)	1.56	0.69	0.08	-88.6
Hazard class 3 waste (moderately hazardous)	7.82	8.31	29.55	+255.6
Hazard class 4 waste (low-hazard)	2,918.93	3,138.00	7,776.96	+147.8
Hazard class 5 waste (practically non-hazardous)	1,802.34	2,408.53	4,837.65	+100.9
<b>Total for hazard class 1 to 5 waste<sup>24</sup></b>	<b>4,733.64</b>	<b>5,575.31</b>	<b>14,216.81</b>	<b>+155.0</b>

<sup>23</sup> Data for 2017 and 2018 provided earlier in the public annual reports for 2017 and 2018 has been recalculated due to:

- The exclusion of data on LLC VDMU, LLC Construction and Installation Directorate No. 1 and Energy Surveys JSC;
- Closure/opening of branch offices of LLC Trest RosSEM;
- The revision of data on LLC Trest RosSEM in the People's Republic of Bangladesh.

Data has been provided on facilities located in the Russian Federation, the Republic of Belarus and Hungary. Information on other overseas projects has not been provided due to the nature of legislative requirements and contractual relations.

<sup>24</sup> Waste in divisions located in Hungary and Bangladesh is not divided into hazard classes in accordance with the local legislation.

## VOLUME OF WASTE IN THE ENGINEERING DIVISION BY PROCESSING METHOD<sup>25</sup>, TONNES

Waste processing method	2017	2018	2019	Δ 2019/2018, %
<b>Total, including</b>	<b>4,733.64</b>	<b>5,575.31</b>	<b>14,216.81</b>	<b>+155.0</b>
- received from other organizations	-	-	-	-
- used in own operations	-	-	-	-
- decontaminated in own operations	-	-	-	-
- stored on site	0.03	571.95	1.09	-99.8
- disposed of at own landfill site	-	-	-	-
- transferred to other specialized organizations for use	212.84	60.16	785.68	+1,206.0
- transferred to other specialized organizations for decontamination	20.25	16.40	34.18	+108.4
- transferred to other organizations for disposal at a landfill site	4,500.52	4,926.80	13,395.86	+171.9
- other	-	-	-	-

<sup>25</sup> Data for 2017 and 2018 provided earlier in the public annual reports for 2017 and 2018 has been recalculated due to:

- The exclusion of data on LLC VDMU, LLC Construction and Installation Directorate No. 1 and Energy Surveys JSC;
- Closure/opening of branch offices of LLC Trest RosSEM;
- The revision of data on LLC Trest RosSEM in the People's Republic of Bangladesh.

## 11.4. ATMOSPHERIC EMISSIONS

In the reporting period, pollutant emissions in the Engineering Division were within the limits established in accordance with valid permits for pollutant emissions into the atmosphere.

The total volume of pollutant emissions into the atmosphere in 2019 decreased by 21.6% year on year to 17.654 tonnes; the biggest reduction (-72.3%) was recorded for nitrogen oxide emissions. The reduction was caused by the completion of construction of Novovoronezh NPP-2 and a decrease in the number of stationary sources of emissions.

### POLLUTANT EMISSIONS INTO THE ATMOSPHERE FROM THE ENGINEERING DIVISION<sup>26</sup>, TONNES

Pollutant emissions into the atmosphere	2017	2018	2019	Δ 2019 /2018, %
Sulphur dioxide	1.33	0.82	0.92	+11.7
Carbon oxide	12.04	8.62	7.55	-12.5
Nitrogen oxide	4.47	3.24	0.90	-72.3
Other substances	49.07	9.83	8.28	-15.7
<b>Total</b>	<b>66.91<sup>27</sup></b>	<b>22.51</b>	<b>17.65</b>	<b>-21.6</b>

<sup>26</sup> Including emissions from stationary sources.

<sup>27</sup> The total for 2017 has been revised from the previously published figure as an arithmetical error had been found.

**At the stage of NPP design, the Division takes into account a number of factors, including an analysis of external impacts. It also carries out an environmental impact assessment of the NPP, including assessing the potential for climate change. NPPs are characterized by one of the lowest CO<sub>2</sub> emission levels among power plants using all types of non-renewable energy sources. Thus, their long-term contribution to potential climate change and global warming is minimal.**

# 11.5. INITIATIVES TO REDUCE THE NEGATIVE ENVIRONMENTAL IMPACT

## EXPENDITURE ON ENVIRONMENTAL PROTECTION

**In the reporting period, the Engineering Division spent a total of RUB 29.6 million on environmental protection.**

A 47% year-on-year increase was related to measures implemented in the Kursk Branch Office of JSC ASE EC, which included industrial environmental monitoring of the quality of wastewater (drainage water) and soil, observation of the River Seym and the relevant water protection area, waste management, the purchase of containers for industrial and consumer waste and renewal of environmental permits in JSC NIKIMT-Atomstroy.



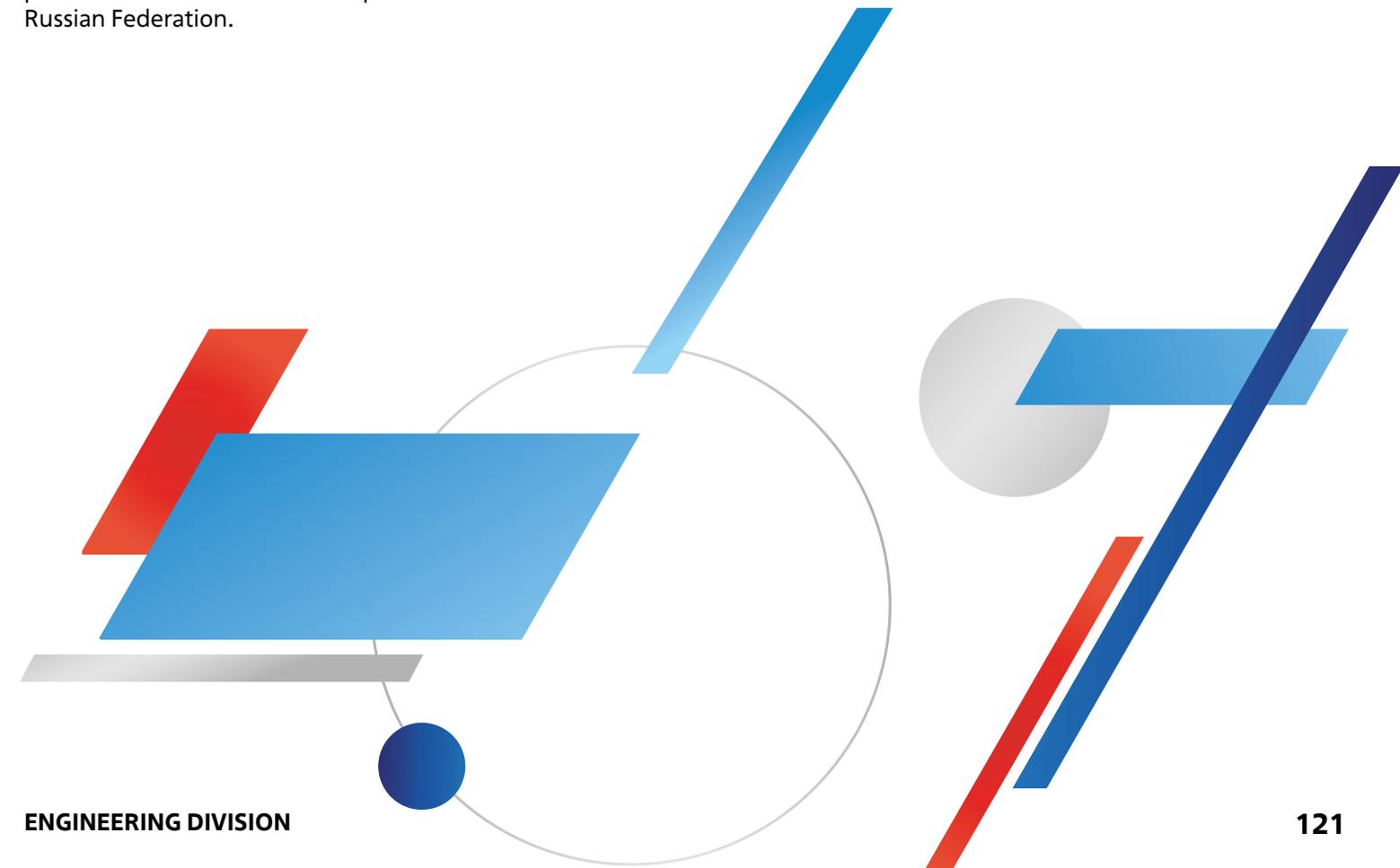
## EXPENDITURE ON ENVIRONMENTAL PROTECTION MEASURES IN THE ENGINEERING DIVISION, RUB MILLION

2017	2018	2019 (target)	2019 (actual)	Δ 2019/2018, %
17.65	20.14	31.95	29.60	+47.0

## USE OF MATERIALS

During construction, installation and road filling at NPP construction sites, the Engineering Division uses construction materials purchased from third-party suppliers. No records of the weight or volume of construction materials used by the Division are kept, as construction and installation operations at construction facilities are performed by contractors, which independently purchase raw materials in accordance with detailed design documentation.

In the course of administrative, economic and project activities, companies of the Engineering Division use paper products purchased from third-party suppliers. At facilities being built and operated by the Division's companies, paper and cardboard waste is collected separately, accumulated in specially equipped areas and subsequently transferred to third-party organizations for recycling. This has resulted in a reduction in charges for the negative environmental impact associated with waste disposal at landfill sites in the Russian Federation.



## 11.6. BIODIVERSITY PRESERVATION

### IMPACT ON BIODIVERSITY

When selecting an NPP construction site, the Division takes into account the requirements of environmental legislation and the location of protected areas. Environmental protection measures are reflected in design documentation for the construction and operation period.

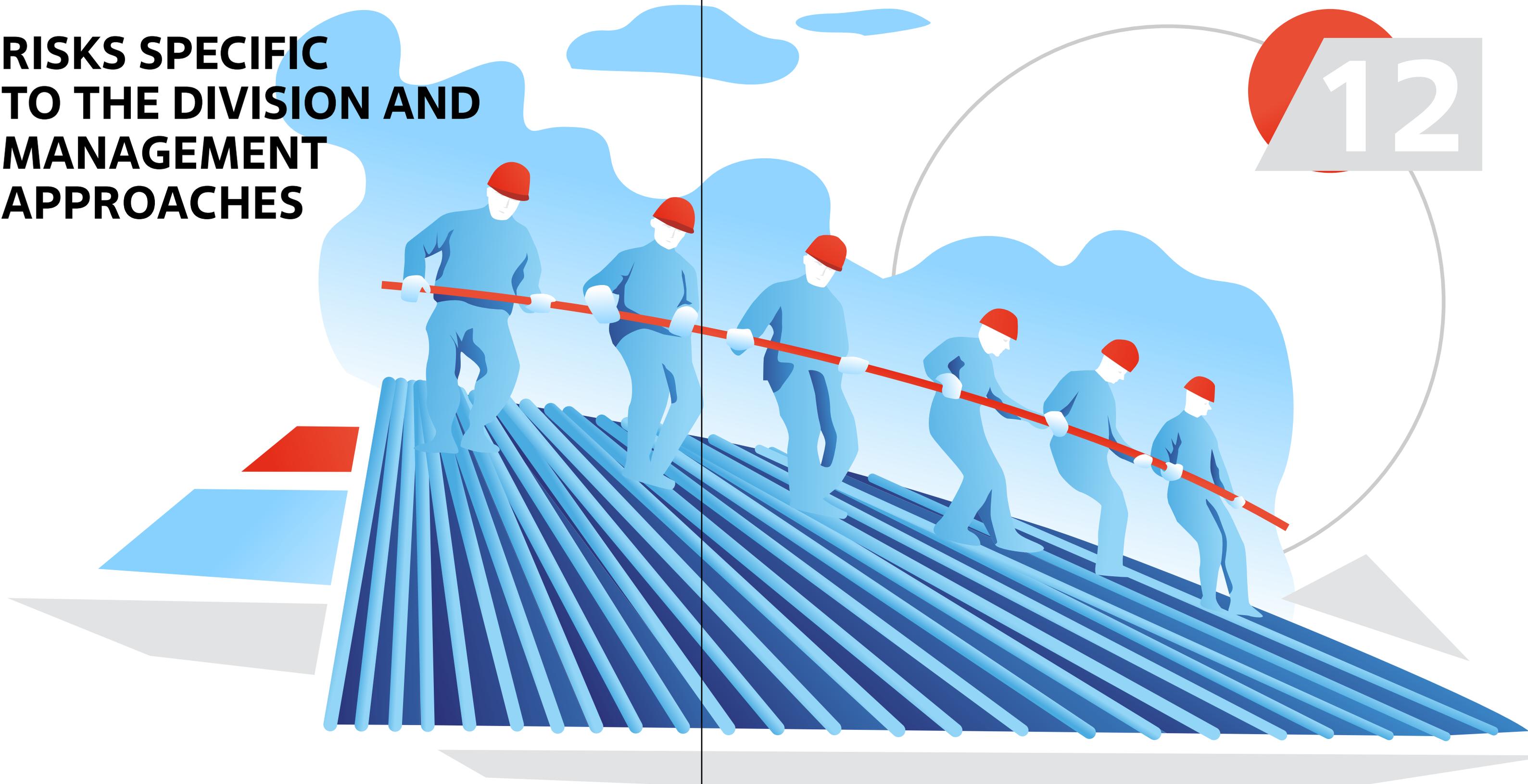
NPP construction in protected areas (locations with a high level of biodiversity) is prohibited by the legislation of the Russian Federation and the Republic of Belarus. Accordingly, construction sites are mainly located in developed agricultural territories and small forest areas where there are few animals and their habitats. These areas are characterized by an insignificant amount of secondary vegetation in the form of undergrowth and bushes that have appeared after the removal of primary vegetation. Decisions regarding NPP construction sites abroad are made by customers.

Currently, there is no construction in progress in protected areas either in Russia or abroad. As a result, companies of the Engineering Division do not make a negative impact on biodiversity in protected areas or areas of high biodiversity value outside protected areas.

Given that the number of both local and migratory birds is insignificant, no special measures are taken to protect them. During a survey of land plots used for NPP construction, no species included in the International Union for Conservation of Nature (IUCN) Red List or national lists of protected species were discovered.

When preparing a rationale for the selection of an NPP process water supply system, the Division takes into account a number of factors, including the environmental conditions at a specific site, the results of assessment of potential damage to aquatic flora and fauna, the cost of fish screens and the cost of remedial measures to mitigate damage to local flora and fauna.

# 12. RISKS SPECIFIC TO THE DIVISION AND MANAGEMENT APPROACHES



The risk management system of the Engineering Division includes five levels:

1. Corporate (strategic).
2. Operational.
3. Project.
4. The level of a branch office/NPP construction site.
5. The subcontractor level.

Risk prevention and hedging mechanisms are integrated into the decision-making system at every level of management. In order to automate the project risk management process, an automated risk management system (ARMS) is used.

The actual risk level and risk management outcomes are monitored by the Internal Control and Audit Function.

Responsibility for project risk management is assigned to project managers; the relevant tasks are performed by risk managers (risk coordinators) appointed for each project. For each project, specialists in the project office and experts in the relevant business areas identify risks; risk owners are appointed, and risk mitigation measures are developed. These measures have helped to reduce some of the risks.

In 2019, risk sessions were held for various projects, including a strategic risk session. 400 persons underwent training in risk management.

In 2019, quantitative risk assessment was carried out for some NPP construction projects in accordance with the requirements of the TCM NC (Total Cost Management Nuclear Construction) programme.

Special features of insurance coverage in the Division are determined by the nature of its operations, the geography of its projects, legislation in customer countries, customer requirements, and contractual obligations. Accordingly, insurance is arranged for each project on a case-by-case basis,

depending on the terms of contracts and agreements concluded by the Division, regional characteristics and national legislation of the country where the project is being implemented.

As in previous years, risks related to climate change had no impact on the Engineering Division's operations in 2019 and do not fall into the category of key risks.

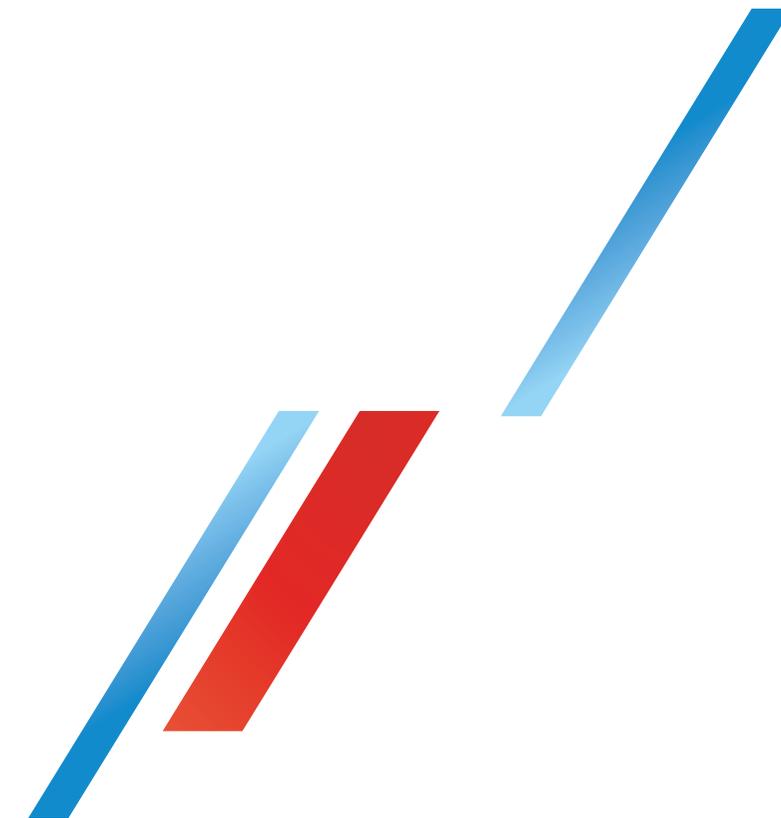


## RISKS AND OPPORTUNITIES SPECIFIC TO THE ENGINEERING DIVISION

Category	Risks/Opportunities	Management approaches
PROJECT RISKS	<b>Risk of non-fulfilment of contractual obligations related to NPP construction in Russia</b>	The risk management system has been implemented for NPP construction projects in Russia.  Key risk indicators are continuously monitored. Scheduled risk sessions are held (as well as unscheduled risk sessions, if necessary). Complicated issues related to NPP construction are reviewed at joint meetings with the customer, ROSATOM's management and other project participants in the format of brief meetings, HQ meetings, Obeya meetings, etc., which enables consistent risk control.
	<b>Risk of non-fulfilment of EPC contracts for NPP construction abroad</b>	Negotiations between the management of ROSATOM and the governments of customer countries.  Development of action plans for cooperation with a foreign customer.  Implementation of the programme to reduce the duration and cost of NPP construction, etc.
	<b>Loss of contract, postponement of implementation of an NPP construction project abroad under an EPC contract</b>	If it is necessary to raise additional or alternative financing for existing projects, steps are taken to find a possibility to finance promising projects through borrowings in the Russian Federation and by using alternative financing sources on debt and equity markets.
	<b>Suspension or reduction of financing of ongoing projects by foreign customers</b>	

Category	Risks/Opportunities	Management approaches
<b>TECHNOLOGICAL RISKS</b>	<b>Risk of technologies developed by the Division becoming uncompetitive</b>	<p>Continuous development of a project management system, structure and culture in the sphere of design and construction aligned with project management standards.</p> <p>Improvement of design quality, cost reduction at all stages of the NPP life cycle through the use of BIM (Building Information Model) and Multi-D technologies.</p> <p>Evaluation of projects at the pre-investment phase according to the criteria of novelty, cost and quality.</p> <p>Assisting customer countries in developing their own nuclear infrastructure.</p> <p>Development of principles underlying the use of standard technical solutions and equipment to reduce the lead time in design and procurement.</p>
<b>HUMAN RESOURCES</b>	<b>Risk of shortage of qualified personnel</b>	<p>Recruitment of specialists who have competences in the field of international logistics, audit of suppliers on international markets and international design.</p> <p>Recruitment of graduates of the Higher Engineering School.</p> <p>Employment of graduates of Russian universities: MEPhI, the Master's Degree Programme of the Russian Foreign Trade Academy, Moscow State University of Civil Engineering, the Incubator project, specialized Russian universities.</p> <p>Assigning experienced ASE specialists and specialists from construction projects completed in Russia to international projects.</p>

Category	Risks/Opportunities	Management approaches
<b>OPPORTUNITIES</b>		
<b>IT</b>	<b>Transformation into a digital company</b>	<p>Digitization of all operational processes.</p> <p>Upgrading infrastructure to support digital transformation.</p>
<b>HUMAN RESOURCES</b>	<b>Improved employee performance amid a transition to a digital company</b>	<p>Personal transformation of employees, training of digital transformation leaders in the Engineering Division and supporting leaders outside the Division. Developing basic knowledge and skills that contribute to the development and implementation of projects promoting the transition to a digital company.</p>



# 13. ADDITIONAL INFORMATION

13

The background features a series of parallel diagonal stripes in various shades of blue and red, creating a dynamic, geometric pattern. A thin vertical line runs down the center of the page, separating the left and right halves of the design.

# 13.1. GRI CONTENT INDEX

Indicator	Chapter/section number	Indicator	Chapter/section number	Indicator	Chapter/section number
<b>GRI 102 General Disclosures (2016)</b>					
<b>Organizational profile</b>		<b>Strategy</b>		102-47	14
102-1	2	102-14	1	102-48	14
102-2	2	<b>Ethics and integrity</b>		102-49	14
102-3	15	102-16	2	102-50	14
102-4	2	<b>Governance</b>		102-51	14
102-5	2	102-18	2	102-52	14
102-6	2	<b>Stakeholder engagement</b>		102-53	14.1
102-7	3	102-40	9.5	102-54	14
102-8	8	102-41	8	102-55	13
102-9	9.2, 14	102-42	13	102-56	14
102-10	Handover of the management of NUKEM Technologies GmbH and NUKEM Technologies Engineering Services GmbH from JSC ASE EC to JSC TVEL 3	102-43	13		
102-11	11	102-44	14		
102-12	2.5	<b>Report profile</b>			
102-13	2.2	102-45	14		
		102-46	14		

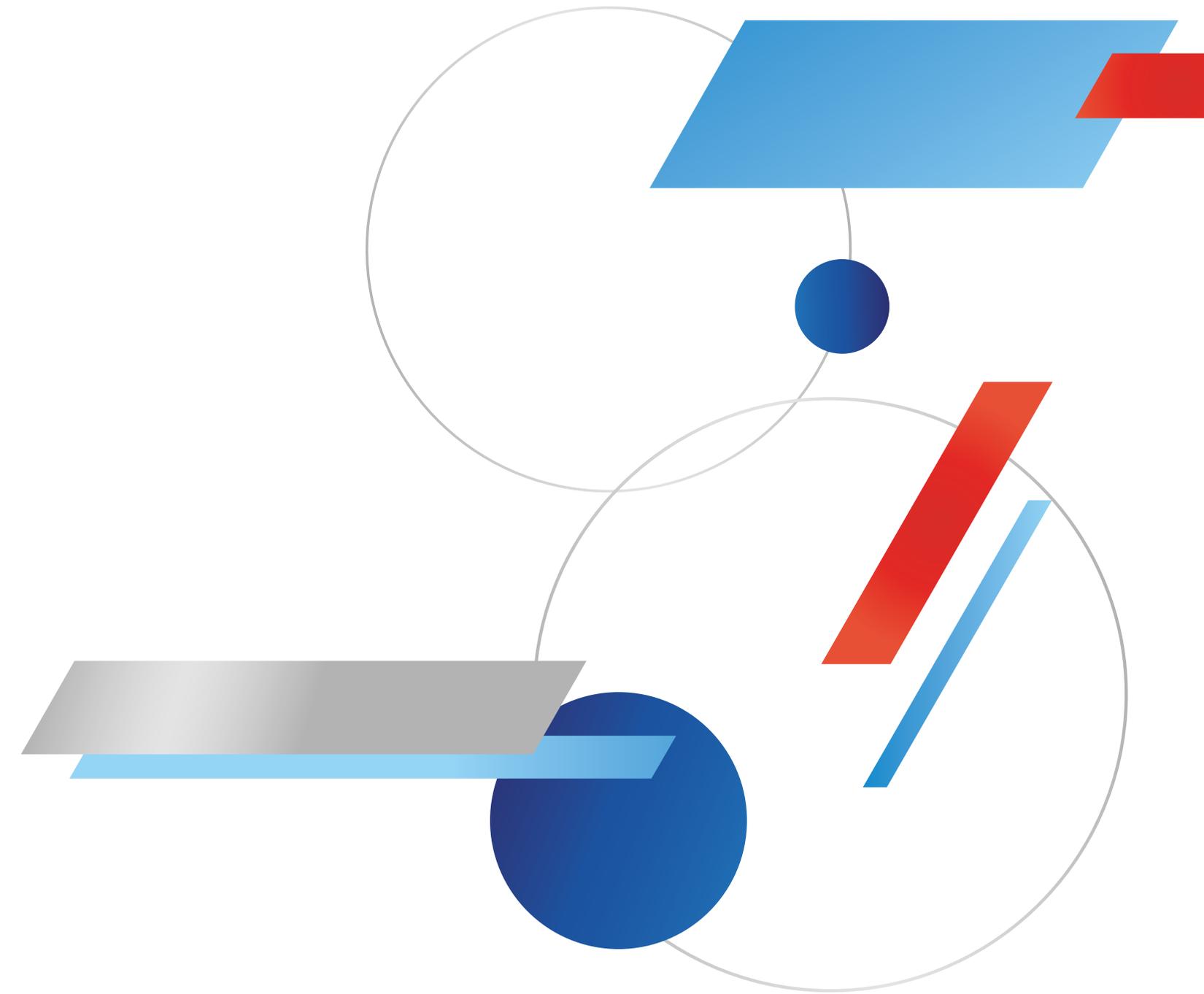
Indicator	Chapter/section number	Indicator	Chapter/section number	Indicator	Chapter/section number
<b>GRI 103 Management Approach (2016)</b>					
103-1	14	103-2	5-12	103-3	14
<b>Material topics</b>					
201 Economic Performance (2016)		304 Biodiversity (2016)		403-9	8
201-2	10, 11, 12	304-2	11	404 Training and Education (2016)	
202 Market Presence (2016)		306 Effluents and Waste (2016)		404-1	8
202-2	9	306-2	11	405 Diversity and Equal Opportunity (2016)	
203 Indirect Economic Impacts (2016)		307 Environmental Compliance (2016)		405-1	2, 8
203-1	9	307-1	11	406 Non-discrimination (2016)	
203-2	9	403 Occupational Health and Safety (2018)		406-1	None
204 Procurement Practices (2016)		403-1	8	413 Local Communities (2016)	
204-1	9	403-2	8	413-1	50% of sites
301 Materials (2016)		403-3	8	413-2	None
301-1	11	403-4	8	416 Customer Health and Safety (2016)	
303 Water (2018)		403-5	8	416-1	10 All projects, 100%.
303-3	11	403-6	8	416-2	None
		403-7	8		

## 13.2. GLOSSARY

<b>Engineering</b>	Engineering and consulting services in the sphere of research, design, calculations and analysis, development of project feasibility studies, recommendations concerning production engineering and management, i.e. the full range of commercial services for arranging and supporting product manufacture and sales, servicing and operation of industrial, infrastructure and other facilities
<b>EPC companies</b>	Companies implementing projects on a turnkey basis. The functions of EPC companies include engineering design, procurement and construction
<b>EPCM companies</b>	Companies applying portfolio management methods and means to turnkey projects. The functions of an EPCM company include engineering design, procurement, construction and project management
<b>Global Reporting Initiative (GRI)</b>	A sustainability reporting initiative
<b>International Nuclear Event Scale (INES)</b>	An international scale of nuclear events serving as a tool for defining the severity of nuclear and radiation safety incidents
<b>LTIFR (Lost Time Injury Frequency Rate)</b>	The occupational injury frequency rate
<b>NPP power unit (power unit)</b>	Part of a nuclear power plant comprising main and auxiliary equipment combined into an integrated process system designed to generate electricity by using one or two turbines without heat generation or with heat generation by converting energy produced from nuclear fuel
<b>Sustainable development</b>	An international agenda for business participation in the harmonious development of economic, environmental and social aspects of society, which means meeting the needs of the present without compromising the ability of future generations to meet their own needs
<b>UN Sustainable Development Goals</b>	A collection of goals for international cooperation set by the United Nations General Assembly in 2015; it includes 17 sustainable development goals and 169 targets
<b>VVER-TOI</b>	A standard optimized and digitized design of a two-unit nuclear power plant with a pressurized water reactor complying with nuclear and radiation safety requirements

<b>WorldSkills</b>	An international non-profit movement aimed at raising the profile and recognition of skilled people and developing professional education through harmonization of the best practices and professional standards worldwide by organizing and holding professional skills contests
<b>APCS</b>	Automated process control system
<b>ARMS</b>	Automated risk management system
<b>EC</b>	Engineering Company
<b>FMBA</b>	Federal Biomedical Agency
<b>GOELRO</b>	State Commission for Electrification of Russia
<b>IAEA</b>	International Atomic Energy Agency
<b>IP</b>	Intellectual property
<b>ISO 14001</b>	An international standard defining the criteria for an environmental management system. It describes the main rules that a company can follow to establish an effective environmental management system
<b>ISO 9001</b>	An international standard defining requirements for a product and service quality management system
<b>ISO</b>	International Organization for Standardization
<b>Multi-D</b>	An integrated industrial process platform for capital construction management
<b>NEIC</b>	Nuclear Energy Information Centre
<b>NFC</b>	Nuclear fuel cycle
<b>NPO</b>	Non-profit organization

<b>NPP</b>	Nuclear power plant
<b>R&amp;D</b>	Research and development
<b>RFTA</b>	Russian Foreign Trade Academy
<b>RPS</b>	ROSATOM Production System
<b>SDGs</b>	Sustainable Development Goals
<b>TPDCW</b>	Training Centre for Professional Development of Construction Workers
<b>VVER</b>	Water-cooled water-moderated power reactor



# 14. INFORMATION ON THE REPORTING PROCESS

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The reporting materials of ROSATOM's Engineering Division for 2019 cover the period of activity from January 1, 2019 through December 31, 2019. Public reporting information is disclosed annually; the previous annual report was published on the website at <https://www.ase-ec.ru/> in 2019. The special feature of the reporting materials for 2019 is the fact that their volume has been reduced significantly compared to the previous year.

### PRIORITIZED TOPICS COVERED IN THE REPORTING MATERIALS:

- Outcomes of transformation of the Engineering Division in 2019;
- The history, achievements and long-term development priorities of the nuclear industry.

The scope of consolidation includes companies forming part of ROSATOM's Engineering Division: JSC ASE EC, JSC ASE, JSC Atomenergoproekt, JSC ATOMPROEKT, JSC NIKIMT-Atomstroy, LLC Trest RosSEM and PJSC Energospetsmontazh.

The scope of consolidation and boundaries of material topics remained unchanged year on year. The following indicators for the previous periods were revised and restated: energy and water consumption, waste generation and management, the number of training hours per employee, with the relevant explanatory comments provided in Chapters 8 and 11 of the report.

In the course of preparation of reporting materials of ROSATOM's Engineering Division for 2019, a foresight dialogue was held on November 12, 2019 to determine material topics, and public consultations were conducted.

The report has been prepared in accordance with the Core option of the GRI Standards.

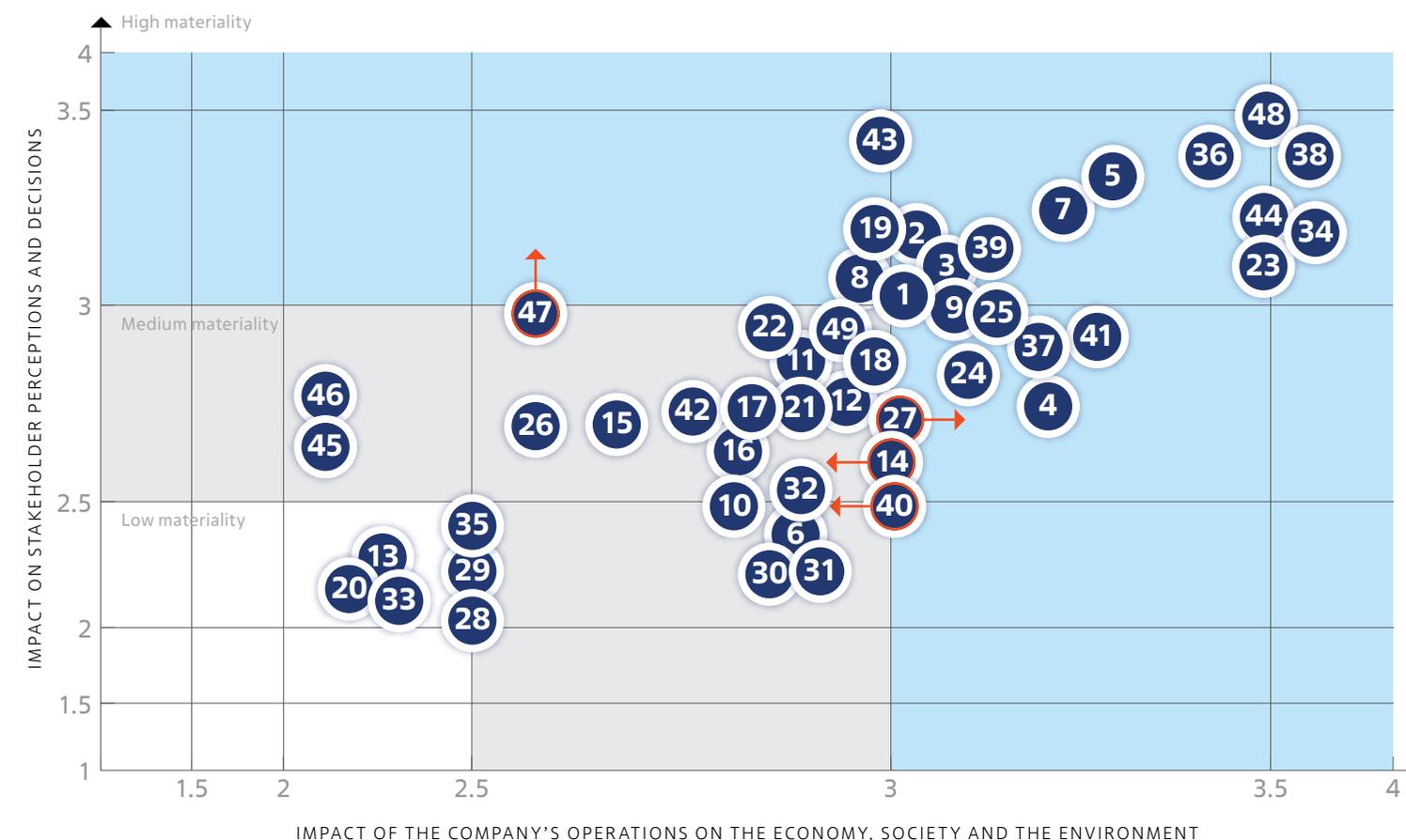
Recommendations received during communication with stakeholders have been taken into account, given the new format of reporting materials (regarding disclosure of information on risk management, innovations and communication events).

After the preparation of reporting materials for 2019 was completed, an internal audit of disclosures was carried out.

### DISCLAIMER

The Report contains a number of forward-looking statements with regard to operating, financial, economic, social and other indicators characterizing future development of the Company. The achievement of targets and objectives depends on the changing political, economic, social and legal environment in Russia and worldwide. As a result, actual performance in the future periods may differ from the forward-looking statements.

### MATRIX OF MATERIAL TOPICS OF THE ENGINEERING DIVISION



### TABLE OF MATERIAL TOPICS

#### High materiality (23 topics + 2 additional topics)

1. Outcomes of implementation of ROSATOM's strategy and contribution of performance in the reporting year to the achievement of strategic goals
2. ROSATOM's presence on the markets for nuclear technologies and services and the markets for new non-nuclear businesses, and the development prospects of these markets
3. Prospects for the development of the nuclear power industry in Russia and globally. Forecasts for the needs of the energy system in Russia and the energy systems of foreign countries

#### High materiality (23 topics + 2 additional topics)

- 4. ROSATOM's financial and economic performance
- 5. ROSATOM's performance in the sphere of international cooperation
- 7. Contribution to economic development of the regions of operation
- 8. Key business risks and opportunities
- 9. Digitization in the industry, contribution to the digitization of the Russian economy and development of digital products
- 19. Performance of ROSATOM's Divisions
- 23. Occupational health and safety (including occupational injury rates)
- 24. Implementation of the social policy with regard to employees
- 25. Cooperation with universities and recruitment of young specialists
- 27. Career and performance management  
(equal opportunities, training and development, talent pool, assessment systems)
- 34. Nuclear power plant safety and management of industrial waste generated in the course of construction
- 36. Ensuring that the Company fulfils its obligations as part of contracted projects
- 37. Development of a project quality management system in the Division
- 38. Reducing NPP construction time and cost
- 39. Improving operational efficiency and labour productivity
- 41. Outcomes of transformation of the Engineering Division
- 43. The Company's compliance with current requirements set for engineering companies abroad
- 44. Environmental and industrial safety at construction sites
- 47. Development of sustainability management practices
- 48. Operating results of the Division

#### High materiality (23 topics + 2 additional topics)

- \* Safety culture development
- \*\* Improvement of NPP designs by incorporating past implementation experience and best practices

#### Medium materiality (20 topics)

- 6. Radiation impact on the environment (including on biodiversity)
- 10. Waste, emissions and discharges
- 11. Environmental measures and expenses and their efficiency
- 12. Financial management and implementation of ROSATOM's investment programme
- 14. Key personnel characteristics (including personnel costs)
- 15. Procurement management  
(including sustainability requirements for suppliers and contractors and measures to prevent unfair competition)
- 16. ROSATOM's knowledge management system and protection of ROSATOM's intellectual property
- 17. External communication projects (exhibitions, nuclear energy information centres, online communications, etc.)
- 18. Implementation of ROSATOM's Innovative Development Programme
- 21. ROSATOM's impact on local communities (social programmes, philanthropy, volunteering)
- 22. Environmental stewardship (energy efficiency)
- 26. Outcomes of import substitution initiatives
- 30. Development of the corporate culture and horizontal cooperation among employees
- 31. Labour/management relations (including the ability of employees to influence managerial decision-making, measures to safeguard the legal rights of employees, the collective agreement)
- 32. Communication projects aimed at increasing employee engagement, recognition and motivation

40. The Company's intellectual property

42. Assessment of suppliers' and contractors' compliance with sustainability requirements

45. The Company's impact on biodiversity in its regions of operation

46. Greenhouse gas emissions and other pollutant emissions

49. Implementation of the quality function transformation programme in the Engineering Division

**Low materiality (6 topics)**

13. Development of closed administrative and territorial formations and areas where NPPs are located

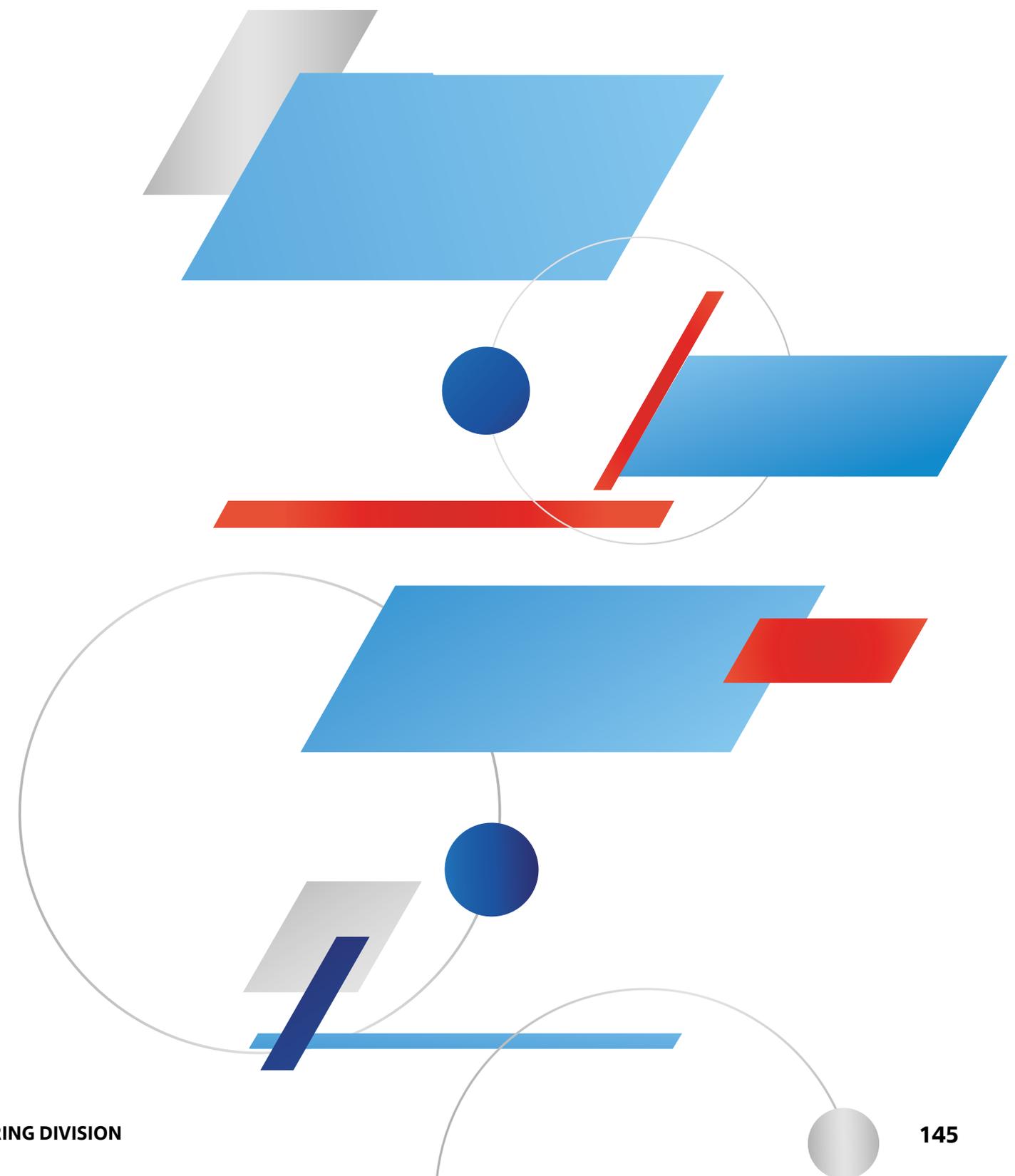
20. Participation in international 'mega science' projects

28. Improvement of corporate governance mechanisms, including the implementation of the Corporate Governance Code recommended by the Bank of Russia

29. Performance of the ROSATOM Production System

33. Industry media coverage

35. Decommissioning of NPP power units



# 14.1. CONTACT DETAILS

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