Appendix No. 10. Glossary and Abbreviations

This 2013 TVEL JSC Report uses the following terms and definitions:

Term	*Definition*
Nuclear power engineering	A sector of power engineering that uses nuclear energy for electrification and heat supply
Becquerel (Bq)	A unit of activity of a nuclide in radioactive source that is equal to activity of the nucleus at the rate of one decay per second
Business model	According to International Integrated Reporting Standard, a business model means a system that describes activity of a company with conversion of capital for achievement of strategic goals and value creation over a short-, mid- and long-term period
Fast neutrons	Neutrons, the kinetic energy of which is higher than a certain definite value. In nuclear reactor physics, neutrons are commonly referrers to fast if their energy is more than 0.1 MeV
PWR	Pressurized water reactor where water is used as both decelerator and heat carrier. The most common types of reactors in Russia: VVER-440 and VVER-1000
Radioactivity discharge	Radionuclide emission into the atmosphere resulting from operation of a nuclear facility
Decommissioning	Decommissioning of a reactor facility and subsequent operations to ensure its safe dismantling, disposal of equipment and further use of the site
Depletion of nuclear fuel	Impoverishment of any nuclide in nuclear fuel due to nuclear transformations of this nuclide during the reactor operation
Highly-enriched uranium	Uranium containing uranium-235 isotope with a mass of 20% or more
Gas centrifuge	Equipment designed for obtaining enriched uranium necessary for ensuring the operation of nuclear reactors of nuclear power plants
Gas diffusion technology	Gas diffusion technology of separation of uranium isotopes based on molecular diffusion through the micropores of membranes (partitions)
Gate approach to investment	Planning and investment approach, in which the investment processes are broken down into phases; the achieved results, plans and risks of the further implementation of the project are reviewed in an integrated manner before each phase, and then the decision to move to the next phase of the project is made
Uranium hexafluoride	Chemical compound of uranium and fluorine (UF_6). It is the only highly volatile uranium-fluorine compound (when heated to 53°C uranium hexafluoride goes over from solid to gas); it is used as a raw material for the separation of isotopes of uranium-238 and uranium-235 by gas diffusion technology or gas centrifuge technology and the production of enriched uranium (chemical combination of uranium and fluorine (UF_6)
Global Reporting Initiative (GRI)	Internationally accepted system of reporting on economic, environmental and social performance based on Sustainability Reporting Guidelines, technical protocols and industry-specific applications

Term	*Definition*
Burnup fraction	Percentage of the initial quantity of number of nuclei of a certain type which have gone through nuclear transformation in the reactor at the neutron influence
Division	A business entity with which ROSATOM State Corporation set the rules for interaction determining this company as a Division, managing business entities covered by the control loop of the Division
Radiation dose	A sum of individual radiation doses received or planned during the work on operation, maintenance, repair, replacement, or disassembly of a nuclear facility
Background radiation	Ionizing radiation composed of space radiation and ionizing radiation of naturally distributed natural radionuclides (on Earth surface, in the air, foodstuffs, water, human organism, etc.)
Closed nuclear fuel cycle	A nuclear fuel cycle in which nuclear fuel, used and discharged from the reactor, is recycled for extraction of uranium and plutonium for reproduction of nuclear fuel
Ash-slag	Waste generated by burning of solid fuel.
Integrated report	Brief overview of how the strategy, management, performance and prospects of a company in the context of the environment lead to value creation over the short, medium and long-term periods
Intellectual capital	The International Integrated Reporting Standard defines intellectual capital as intangible assets of intellectual nature
Research reactor	A nuclear reactor used as a research object to obtain data on the physics and technology of reactors required for the design and development of this type of reactors or components thereof
Capital	The International Integrated Reporting Standard defines it as resources and relations that serve as the source and the results of value (integrated value) creation processes
Uranium conversion	A chemical technology process of converting uranium-bearing materials into uranium hexafluoride
Radiation control	Acquisition of information on the radiation situation in the organization and environment and on the levels of radiation of humans (including dosimetric control and radiometric surveillance)
Indirect energy use	Use of energy produced outside the organizational limits of the organization preparing the report
Production localization	Organization of production outside the Russian Federation
Neutron	An elementary particle that has no electrical charge and is present in the nucleus of each atom except hydrogen. Single mobile neutrons moving at different speeds arise because of the fission reaction. Slow (heat) neutrons, in their turn, can easily cause fission of nuclei of "fissionable" isotopes, e.g., U-235, Pu-239, U-233; fast neutrons can cause fission of nuclei of A "fertile" isotope, e.g. U-238. Sometimes atomic nuclei just capture neutrons
Low-enriched uranium	Uranium containing U-235 isotope with a mass of fewer than 20%
Nuclide	Type of atom with a definite number of protons and neutrons in the nucleus characterized by an atomic mass and atomic (order) number
Depleted uranium	Uranium in which the content of U-235 isotope is lower than in natural uranium

Term	*Definition*
Enrichment (by isotope)	a) particular isotope atom content in the mixture of isotopes of the same element, if it exceeds the proportion of the isotope in a mixture of naturally occurring (in %); b) a process resulting in increased content of a particular isotope in a mixture of isotopes
Uranium ore enrichment	Totality of processes of treatment of mineral uranium-containing raw material for the purpose of separation of uranium from other minerals contained in the ore. Meanwhile, there is no change in the composition of minerals, just a mechanical separation of ore concentrate
Enriched nuclear fuel	Nuclear fuel in which the content of fissionable nuclides is higher than in natural raw material
Enriched uranium	Uranium in which the content of U-235 isotope is higher than in natural uranium
Fuel element cans	Reactor quality uranium is usually enriched approximately to 3.5% U-235, and the content of U-235 in weapon-grade uranium is over 90% Metal tubes in the active zone of the reactor containing oxide fuel pellets
Circulating water	Water that has been used in the processing cycle and that is to be used for the same purposes after cooling or purification
Radioactive waste treatment	General term that covers all activities related to the processing, conditioning, transportation, storage and burial of radioactive waste
Ozone-depleting substances	Any substance with an ozone-depleting potential higher than 0, able to deplete the stratospheric ozone layer. Most of ozone-depleting substances, including CFC, halons and methylbromide, fall under the Montreal protocol as amended
Trial performance	Stage of PP commissioning from the beginning of the power launch till the PP acceptance for industrial operation
Depleted uranium	Uranium depleted through extraction of U-235, which is economically unfeasible to use; stored at a disposal site (dump)
Primary energy sources	Source energy form used for satisfying the energy needs of the organization preparing the report. Examples of primary sources include irreplaceable energy sources, e.g. coal, natural gas, oil and nuclear energy. They also include such replaceable sources as biomass, sun and wind energy, geothermal and hydraulic energy
First nuclear project	The USSR's nuclear project aimed at creating weapons of mass destruction with the use of nuclear energy
Fuel recharging	Operation performed by material-handling machines for replacement of the used fuel; the fuel radiation degree at which the recharging is done depends on the fuel composition after radiation, on the allowable work duration and on the reactivity change
Fuel reprocessing	A complex of chemical processes designed to remove fission products from spent nuclear fuel and fissile material recovery for reuse

Term	*Definition*
Radioactive waste processing	Technological operations aimed at altering the aggregative state and/or physic-chemical properties of radioactive waste and transforming them into forms suitable for transportation, storage and/or disposal
Maximum permissible dose	The maximum value of the individual equivalent radiation dose per year, which does not cause unfavorable changes in the personnel's health after 50 years of uniform exposure
Manufactured capital	The International Integrated Reporting Standard defines it as man-made physical facilities (as opposed to natural objects) which the Company uses to manufacture products and services: - buildings and structures; - equipment; - infrastructure objects
Natural capital	The International Integrated Reporting Standard defines it as renewable and non-renewable natural resources and processes, including air, water, soil, mineral resources and forests; - biological diversity and environmental balance
Fuel production	Nuclear fuel production, generally in the form of ceramic pellets enclosed in metal tubes (fuel elements), which are subsequently assembled in fuel assemblies (TVS)
Radioactive isotopes	Isotopes with unstable nuclei undergoing radioactive decay
Radioactive waste	Nuclear materials and radioactive substances that no longer can be used
Radiation safety	System of measures aimed at limiting the exposure of employees and public to the lowest values of the radiation dose achieved by means acceptable to the society, and preventing the occurrence of early radiation effects and limiting manifestations of the long-term effects of radiation to an acceptable level
Radionuclides	General name for radioactive atoms that pose a great danger to environment
Regenerated uranium	Uranium separated from used nuclear fuel in the process of chemical processing for reuse in nuclear fuel (regenerated fuel)
Rehabilitation of contaminated areas	Reduction of the extent of radioactive contamination to the level ensuring the maximum protection of population and recovery of all elements of the ecosystem (water, soil, air) to the current normative level
Discharge of radioactive substances	Controlled discharge of radionuclides into the water with liquid effluents of a nuclear facility
Social capital	The International Integrated Reporting Standard defines it as a system of relationship established within the Company and between the Company, various groups of stakeholders and other communities that serves to enhance prosperity of all stakeholders
Social partnership	A system of institutes and mechanisms of coordination of the interests of the production process participants (workers, employers, state authorities, local self-government) based on equal cooperation
International Standard on Assurance Engagements (ISAE 3000)	International Standard that regulates audit of non-financial reports

Term	*Definition*
Sublimation production	Uranium hexafluoride production
Fuel pellet	A pellet made of compacted uranium dioxide that serves as the base of nuclear fuel and is placed inside fuel elements
Fuel assembly	Assembly of fuel elements (rods, bars, plates, etc.), held together by support plates and other structural components all-in-one during transportation and exposure in the reactor. Assemblies are loaded into the core of a nuclear reactor
Heat carrier	Liquid or gas used for heat transfer from the active zone of the reactor to steam generators or directly to the turbines
Production placement topology	Plan of territorial location of production facilities
Uranium-233	Artificial uranium isotope with half-life period of 1.6 x 10^5 years obtained by transmutation of thorium-232 after neutron capturing; a fissionable nuclide
Uranium-235	Natural uranium isotope with atomic mass 235 and half-life of 7.1 x 10^8 years; the only fissionable material existing in nature
Uranium-238	Natural uranium isotope with atomic mass 238 and half-life of 4.5 x 10^9 years; can be used as fertile material to obtain plutonium-239
Financial capital	The International Integrated Reporting Standard defines it as financial resources that are: — available to the Company in the course of products manufacturing and provision of services; — received by way of loans, investment made by owners and uncompensated receipts from operating activities and in the form of investments
Backend	An element (part) of fuel assembly
Tail storage	Complex of special structures and equipment designed for storage or burial of radioactive, toxic and other non-utilizable wastes of minerals enrichment called tails
Human capital	The International Integrated Reporting Standard defines it as competencies, abilities, expertise and motivation of the people, including: — involvement in corporate management technologies, risk management methods and ethics; — understanding and support of corporate strategy; — loyalty to and motivation for reforms, including the ability to control, manage and cooperate
Power unit	One of the NPP reactors with necessary additional equipment
Nuclear facility	Any installation that generates, processes or handles radioactive or fissionable materials
Nuclear energy	Internal energy of atomic nuclei released by nuclear fission or nuclear reactions
Nuclear fuel	Material containing fissile nuclides capable of starting chain reaction when placed in a nuclear reactor
Nuclear waste	Radioactive materials generated on various stages of the nuclear fuel cycle, including development of uranium deposits, enrichment, fuel production, reactor operation, fuel processing, etc.

Term	*Definition*
Nuclear reactor	A unit wherein a controlled chain nuclear reaction with energy release takes place. Reactors are classified by purpose, carrier type, design and other characteristics
Nuclear fuel cycle	Sequence of manufacturing processes for nuclear reactor functioning, from uranium mining to the disposal of radioactive waste

Abbreviations

Term	*Definition*
ASKRO	Automated radiation monitoring system
LNPS	Low-capacity nuclear power station
ACS DEP	Automated Control System for Design Engineering Pre-production
NPP	Nuclear power station, an industrial facility that generates electric power
BN	Fast neutron reactor where sodium is the carrier in the first and second loop and water and vapor in the third loop. In Russia, operated at Beloyarsk NPP
VVER	Water — water energy reactor
HEU	Highly enriched uranium
GC	Gas centrifuge
SA	Subsidiaries and affiliates
DPKR	Department of Legal and Corporate Operations of ROSATOM State Corporation
UIPS	Uniform Industrial Procurement Standard of ROSATOM State Corporation
SWU	Separation work unit
USLR	Unified System of Labor Remuneration
LC	Life cycle
CATU	Closed Administrative Territorial Unit
RR	Research reactor
IMS	Integrated Management System for Quality, Environment and Safety
ITER	International Thermonuclear Experimental Reactor built on basis of a tokomak by an international group of scientists under the aegis of IAEA. It is supposed to be a type of the world's first DEMO thermonuclear power plant

Term	*Definition*
I&C	Instrumentation and controls
KPI	Key performance indicators
CRMS	Corporate Risk Management System
KETVS	Combined experimental fuel assembly
IAEA	International Atomic Energy Agency (IAEA), international controlling body monitoring the observance of nuclear safety and non-proliferation of nuclear weapons in the world
MW	Megawatt — unit of power equaling to 106 Watts. MW(e) relates to electric power of a generator; MW(t) relates to thermal power of a reactor or heat source (e.g., the full thermal power of the reactor itself is generally three times higher than the electric power)
MOX-fuel	Mixed Oxide Nuclear Fuel (generally on basis of uranium and plutonium)
CU	Conversion unit
IIRS	International Integrated Reporting Standard
MFR	Fabrication-refabrication module
R&D	Research & Development
LEU	Low-enriched uranium
FE NFC	Front end of nuclear fuel cycle
STC	Scientific and Technical Council
EIAS	Environmental impact assessment study
DUHF	Depleted uranium hexafluoride
EDEC	Experimental demonstration energy complex
EP	Environment protection
SNF	Spent nuclear fuel
FNPP	Floating nuclear power plant
PTC	Permanent technical commission
SFI	Suggestion for Improvement
RPS	ROSATOM Production System
FCC	Fabrication and Refabrication of Close-Packed Fuel Cycle Center

Term	*Definition*
RAW	Radioactive Waste
RBMK	High-power pressure-tube reactor — a type of single-loop power reactor where water is the heat carrier and graphite is the decelerator
RN	Radionuclides
RPRAEP	Trade Union of Nuclear Energy and Industry of Russia
SSC	Separation-Sublimation Complex
MSE	Managers, specialists, employees
RU	Reactor facility
ICS	Internal Control System
dpa (displacement per atom)	A unit of irradiation that serves as a physical basis for matching the levels of damage within reactors with varying neutron spectra and irradiation by various particles
SDIC	Special Department of Internal Control
JV	Joint Venture
EPLS	Emergency Prevention and Liquidation System (Facility Level)
TVS	Fuel assembly
TVS-KVADRAT	Name of a FA for PWR reactors developed in Russia
TVEL	Fuel element
TVEL FC Fuel Company	TVEL JSC and enterprises controlled by the Company and included in consolidated reports.
HPP	Heat and power plant
CFHC	Chlorofluorohydrocarbons
FMBA	Federal Medical and Biological Agency
FSFM	Federal Service for Financial Markets
FTP	Federal target program
GPR	Superheat pressure tube graphite power reactor (Bilibino NPP)
ETVS	Experimental fuel assembly
NRS	Nuclear and Radiation Safety

Term	*Definition*
NF	Nuclear fuel
NRHS	Nuclear and radiation hazardous sites
NFC	Nuclear fuel cycle — a complex of measures for ensuring the functioning of nuclear energy engineering including extraction and processing of uranium ore, fuel fabrication, transportation to the NPP, storage and treatment of UNF. In the event of UNF burial, the NFC is called open; if fuel processing and reuse is provided, the cycle is closed
BWR	Boiling water reactor — a reactor that uses boiling water as heat carrier
EBITDA	Earnings before Interest, Taxes, Depreciation and Amortization — an analytical indicator that means the amount of profit before income tax expense, interest and accumulated depreciation
INES	International Nuclear Event Scale
PR, GR	Public relations, Government relations
PWR	Pressurized water reactor — foreign design reactors that use pressurized water — analogue of VVER

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