Scientific and technical support to the nuclear and radiation safety regulator. SEC NRS experience

A. Khamaza, PhD

SEC NRS Director

ETSON Vice-president

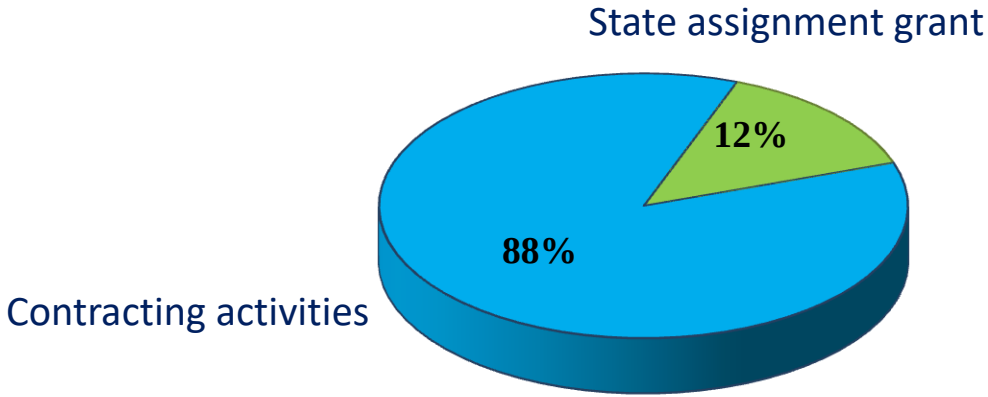
February 8-9, 2022

SEC NRS: general information

- ✓ Established in 1987
- ✓ Non-profit, federal state-owned enterprise
- ✓ TSO of Rostechnadzor
  - ✓ Federal Atomic Law
  - ✓ Decree of the Russian Government
- ✓ Member of ETSON since 2012
- ✓ Member of AER since 2017
- ✓ Actual personnel – 317
  (48 PhD, 6 Doctor of Sciences)

Financial data in 2021

Budget: 1,17 billion rubl.



Object and goals of activity

Object – carrying out works, provision of services to ensure the functions of the state safety regulatory body in the use of atomic energy

Goals:

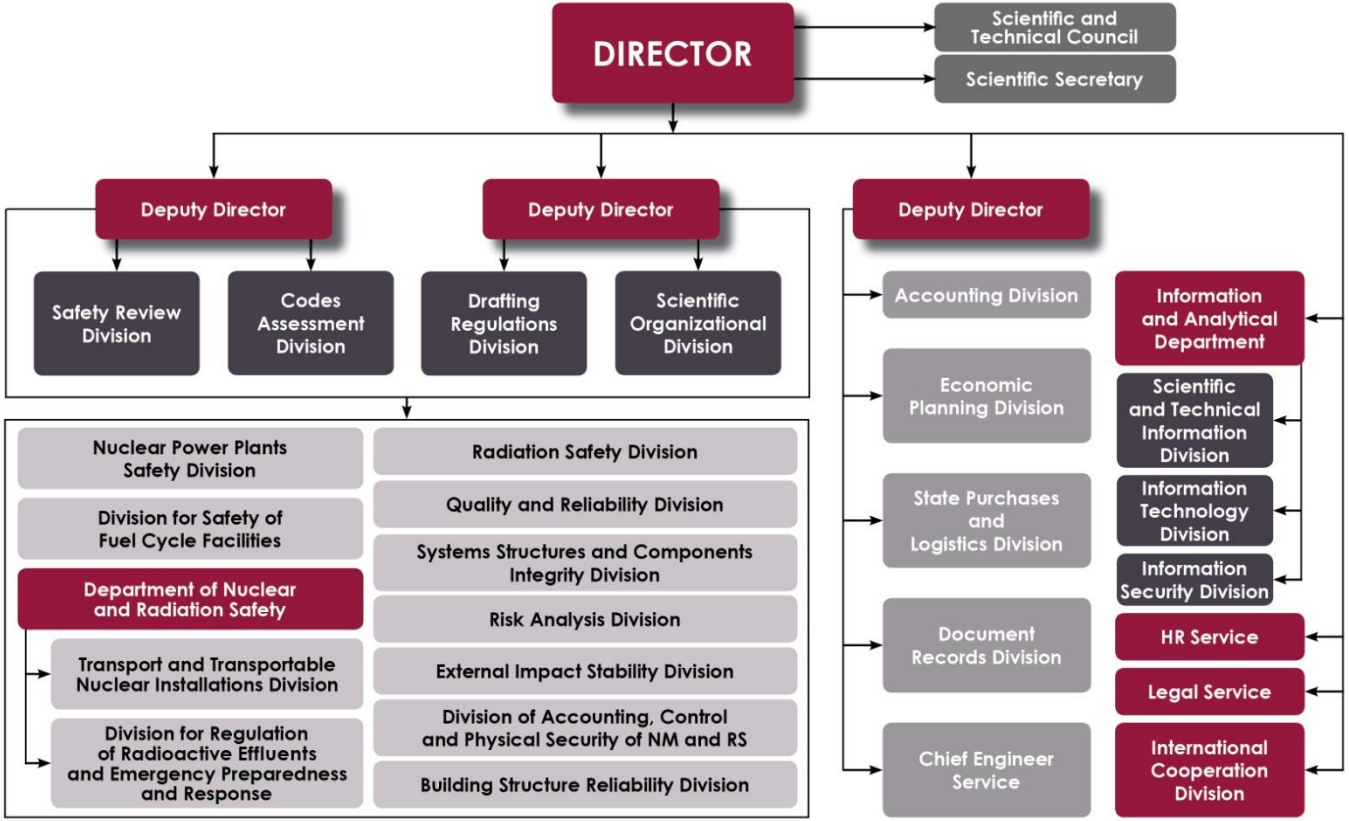
- ✓ Carrying out research, testing, safety review and (or) other safety assessment of facilities and activities in the field of atomic energy use
- ✓ Developing and modification or regulatory framework
- ✓ Scientific and technical provision of state safety regulation



Main missions

SEC NRS	Rostechnadzor
Drafting of regulatory documents	Safety regulations development and enactment
Safety review	Licensing of activity in the field of atomic energy use
Information and analytical support	State supervision of nuclear and radiation safety and physical protection
Technical and analytical support	Emergency preparedness and response

Organization Chart of SEC NRS



Priority R&D to support state regulatory body (1)

- Nuclear and radiation safety
- Integrity of equipment and pipelines of reactor installations
- Methods on BDBA and accidents consequences calculation
- Probabilistic Safety Analysis
- Accounting, control and physical security
- Safety of RW, SNF and RS



Priority R&D to support state regulatory body (2)

- Scientific and technical support to Rostechnadzor's Information and Analytical Centre (IAC)
- Reliability and stability of building structures against external impacts
- National Reports under Conventions:
  - Convention on Nuclear Safety;
  - Joint Convention on the Safety of Spent Fuel Management

  and on the Safety of Radioactive Waste Management



Legislation of the Russian Federation in the field of atomic energy



establishes legal framework and principles for regulation of relationships in the use of atomic energy



establishes legal framework for provision of radiological safety of the public

Other Federal Laws:

- ✓ 'On management of radioactive waste and amendment of some acts of law of the Russian Federation'
- ✓ 'On environmental protection'
- ✓ 'On technical regulation'

RF Government Decrees

- ✓ 'On federal state supervision over the use of atomic energy'
- ✓ 'On licensing of activities in the field of atomic energy'
- ✓ 'On endorsement of the 'Regulation for development and approval of federal regulations in the field of atomic energy''
- ✓ 'On the specifics of conformity assessment for products subject to requirements pertaining to the safe use of atomic energy…'
- ✓ 'On limits for radioactive releases and limits for radioactive discharges …'

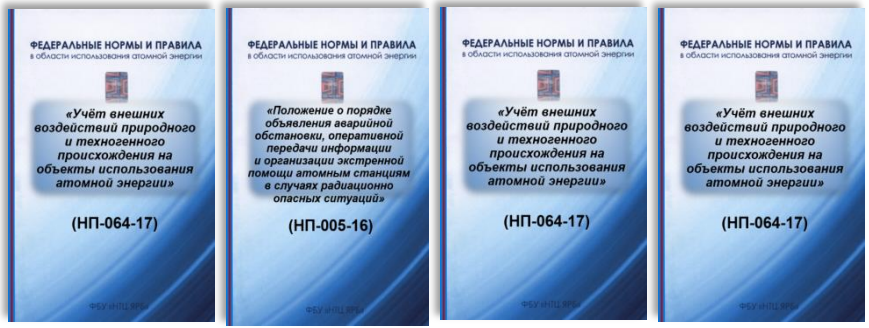
Regulatory framework for safety in the field of atomic energy use

Federal Rules and Regulations

obligatory for all legal entities and individuals throughout the Russian Federation

drafting and approval procedure is established by the Government of the Russian Federation

approved and put in force by the state safety regulatory authorities in accordance with their competence



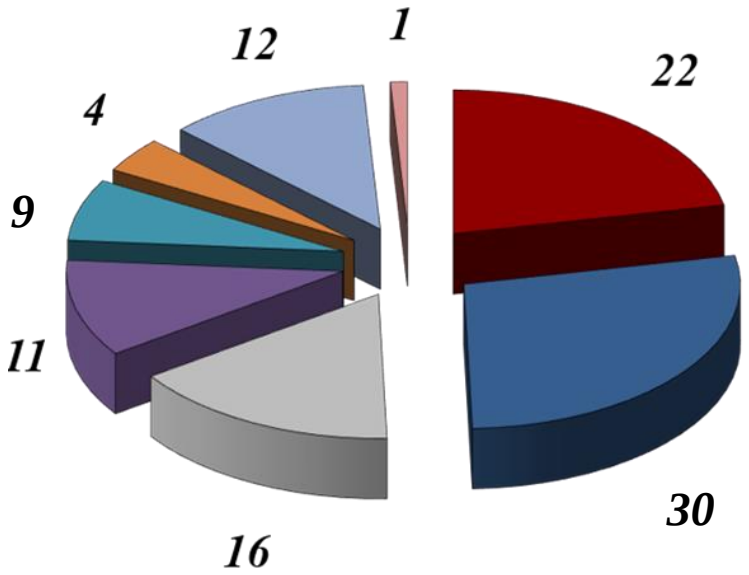
Rostechnadzor

performs functions for the development and implementation of state policy and regulation in the field of atomic energy use

System of Federal Rules and Regulation in the field of atomic energy use

Applicable to:

- All nuclear facilities
- Nuclear power plants
- Nuclear fuel cycle facilities
- Nuclear research installations
- Watercraft with nuclear installations
- Radiation sources
- Radioactive waste management
- Spacecrafts with nuclear reactors



✓ 105 effective documents

Arrangement and conduct of safety review



In the course of licensing

Compliance analysis of safety justification for FRR to the state-of-the art

Article 26 of FZ-170

arranged by Rostechnadzor

carried out by TSO

Quality assurance while safety review

SEC NRS

Experts

Head of expert's division

Work Leader (participatory assessment)

Head of division responsible for safety review

Quality control

Deputy Directors

Rostechnadzor

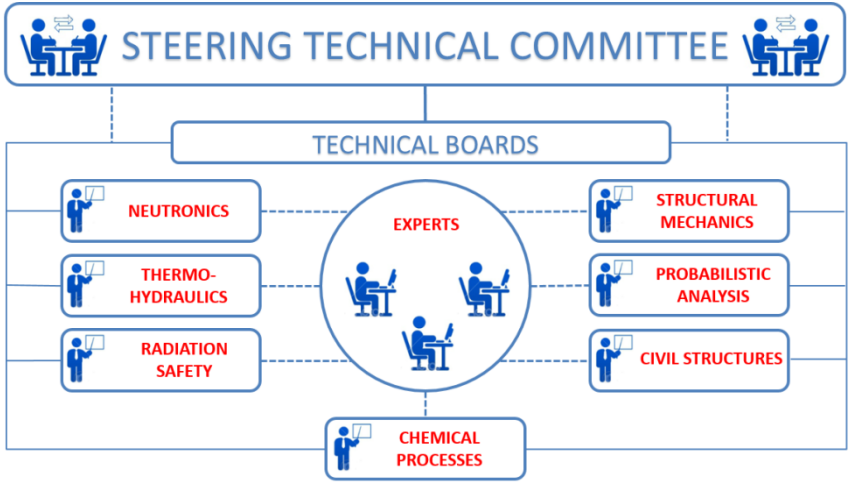
Science and Technology Board of Rostechnadzor (Rosatom, Rosenergoatom, other organizations)



СЕРТИФИКАТ

соответствия системы менеджмента требованиям стандарта ISO 9001:2015

Rostechnadzor Expert Council for Software Certification





РОСАТОМ
НТЦ ЯРБ
НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ ЦЕНТР «КУРЧАТОВСКИЙ ИНСТИТУТ»
ROSENERGOATOM
ELECTRIC POWER DIVISION OF ROSATOM
IBRAE
НИКИЭТ им.Н.А.Доллежаля JSC «NIKIET»
НИТИ им. А.П. Александрова
ПРОИЗВОДСТВЕННОЕ ОБЪЕДИНЕНИЕ МАЯК
ВНИИАЭС
ОКБМ АФРИКАНТОВ
ВНИИНМ имени А.А.Бочвара
КРАСНАЯ ЗВЕЗДА
ГНЦ РФ - ФЭИ
НИИАР
ATOMENERGOPROEKT
State Corporation "Rosatom" Enterprise
ОКБ «ГИДРОПРЕСС»
ПРЕДПРИЯТИЕ ГОСКОРПОРАЦИИ «РОСАТОМ»
ATOMPROEKT
Enterprise of State Corporation Rosatom
НИАЭП
РОС РАО
РФЯЦ ВНИИЭФ

Information activity (1)

“Nuclear and Radiation Safety” Journal

- ✓ Official Rostechnadzor Periodical. Established in 1998
- ✓ Included to the list of scientific and engineering periodicals of the Higher Attestation Commission



Regulatory documents

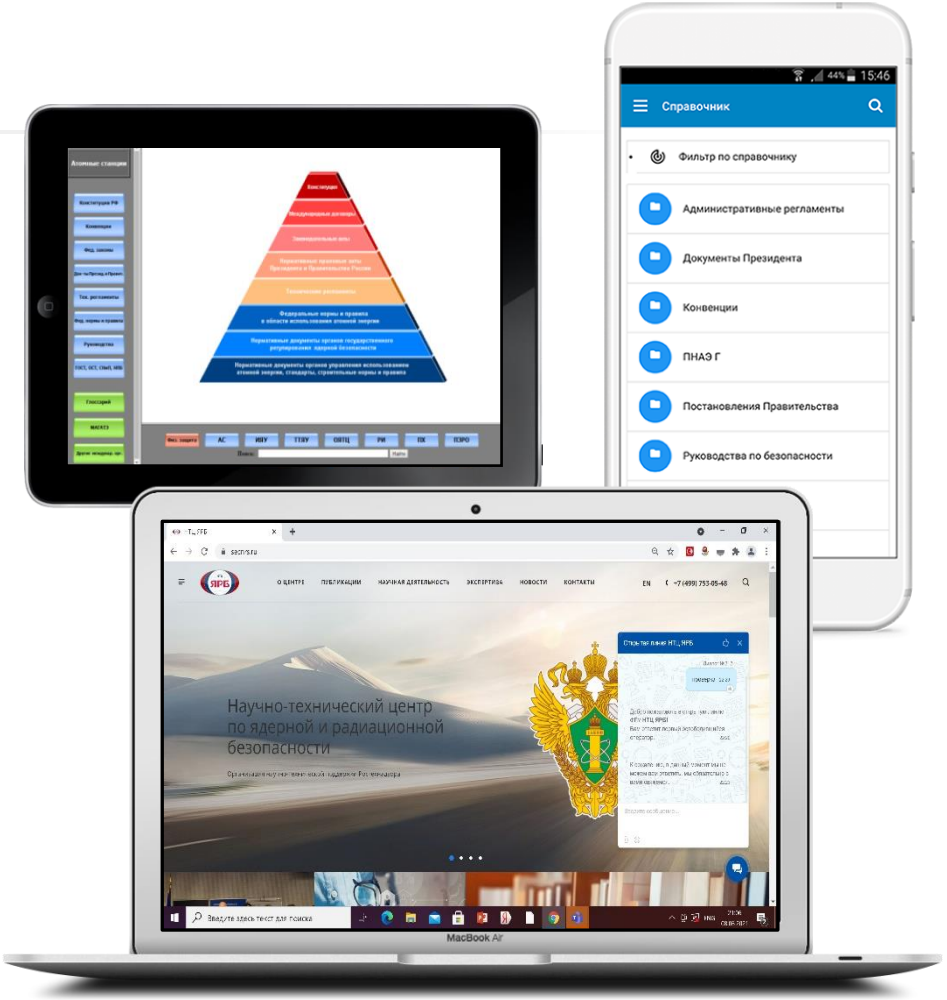
- ✓ Federal Rules and Regulation
- ✓ Safety Guides
- ✓ Methodological recommendations

Digest (analytical reviews)

Information activity (2)

Information resources

- ✓ Organization’s website
- ✓ Mobile application
- ✓ Online Rostechnadzor’s library
- ✓ Website of “Nuclear and Radiation Safety” Journal
- ✓ Rostechnadzor’s RIS database
- ✓ Digital portal for software review



Licenses and certificates

Licenses:

- for carrying out safety review
- For carrying out works, related to state secret information

The mass media registration certificate:

- Nuclear and Radiation Safety Journal
- SEC NRS website
- Website of “Nuclear and Radiation Safety” Journal

Certificates of compliance to the requirements:

- GOST R ISO 9001-2015 (ISO 9001:2015)
- ISO 9001:2015 (орган сертификации – TÜV Thüringen e.V.)



Interactions with Russian Organizations

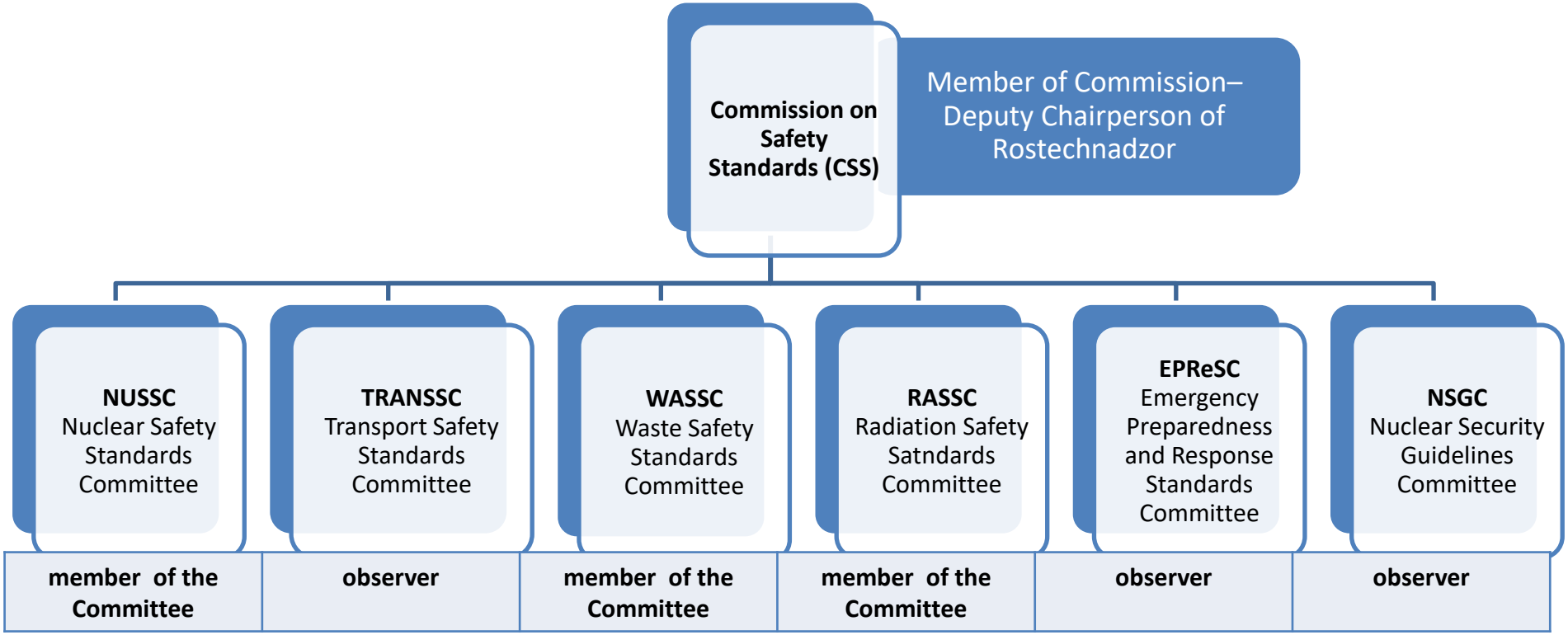


- ✓ Rosatom design, construction and scientific organizations
- ✓ Institutes of Russian Academy of Science (IBRAE RAN, Institute of Physical Chemistry and Electrochemistry)
- ✓ National Research Nuclear University “MEPhI”
- ✓ Russian Scientific Commission on Radiological Protection

International Cooperation

- ✓ International Atomic Energy Agency
- ✓ OECD Nuclear Energy Agency
- ✓ Commission of CIS Member States on Peaceful Use of Atomic Energy
- ✓ Western European Nuclear Regulators' Association
- ✓ WWER Regulators Forum
- ✓ European Technical Safety Organizations Network
- ✓ Atomic Energy Research
- ✓ Bilateral cooperation (IRSN, GRS, STUK etc.)

IAEA Commission on Safety Standards



Assistance to embarking countries

- ✓ Republic of Belarus
- ✓ Republic of Turkey
- ✓ People's Republic of Bangladesh
- ✓ Arab Republic of Egypt
- ✓ Republic of Uzbekistan

✓ Main areas of assistance

- Review of the existing regulatory and legal framework
- Drafting of safety regulations and guides
- Safety review
- Consulting services

Cooperation with the Republic of Belarus (1)

An Agreement between the Federal Environmental, Industrial and Nuclear Supervision Service (Russian Federation) and the Ministry of Emergencies of the Republic of Belarus on cooperation in the area of nuclear and radiological safety regulation in the process of peaceful use of atomic energy (dated December 20, 2013) covering the following principal areas:

- ✓Development of legal regulatory framework
- ✓Licensing
- ✓Supervision and control
- ✓Regulation of the safe management of RW and SNF
- ✓Assessment of NPP performance indicators, safety enhancement plans and actions
- ✓Emergency preparedness and response
- ✓Training of regulator staff
- ✓Conformity assessment for products (works, services)
- ✓Other areas

Cooperation with the Republic of Belarus (2)

Scientific visits

Consultancy services, e.g., on setting up Gosatomnadzor IAC

Field training for the staff of Belarus organisations

Communication with SSI ‘JIPNR-Sosny’ on review and assessment of safety documentation for Belarusian NPP

Cooperation with the Republic of Belarus (3)

An Agreement on scientific and technical cooperation between the SEC NRS and the state scientific technical institution 'Center for nuclear and radiological safety' (dated March 27, 2019) covering the following principal areas:

- ✓Legal regulation
- ✓Safety review
- ✓Management of SNF and RW
- ✓Emergency preparedness and response
- ✓Decommissioning
- ✓Graded and risk-informed approach (integrated approach) to control and supervision
- ✓Other areas

Scientific and technical support in the framework of cooperation with the Republic of Belarus

2018-2019

✓Safety review of documentation demonstrating the operational safety of the nuclear installation at Unit 1 of the Belarusian NPP (under a contract with the State Scientific Institution 'JIPNR-Sosny')

✓A round of meetings to discuss comments and suggestions from the safety review of Unit 1 of the Belarusian NPP

✓Arrangement of field training for the Acting Director of the STC NRS

2020

✓Safety review of documentation demonstrating the safety of Unit 1 of the Belarusian NPP at the stages of first criticality and power start-up (under an agreement with the Gosatomnadzor of the Republic of Belarus)

✓Provision of consultancy services on arrangement of regulatory control over radioactive releases and discharges (under an agreement with Gosatomnadzor of the Republic of Belarus)

Scientific and technical support in the framework of cooperation with the Republic of Belarus

2021

- ✓ Evaluation of documents demonstrating nuclear and radiological safety at the stage of the commissioning of Units 1 and 2 of the Belarusian NPP (under an agreement with Gosatomnadzor of the Republic of Belarus)
- ✓ Review and evaluation of documents demonstrating provision of nuclear and radiological safety during operation of Unit 2 of the Belarusian NPP (under a contract with the State Scientific Institution ‘JIPNR-Sosny’)

2022

- ✓ Review and evaluation of documents demonstrating fire safety during operation of Unit 2 of the Belarusian NPP (under a contract with the State Scientific Institution ‘JIPNR-Sosny’)

Cooperation with the Republic of Belarus (4)

Union State Programme ‘Improvement of approaches to emergency preparedness, emergency response and safety regulation in the use of atomic energy’

Raising resource preparedness to respond to radiological emergencies	**Development of safety regulation approaches in nuclear energy**	**Improvement of HR management system at regulatory bodies of the two states**

International Conference on the Challenges faced by Technical and Scientific Support Organizations (TSO) in Enhancing Nuclear Safety and Security

✓ Dates and venue:

October 10 – 13, 2022 , St-Petersburg

October 14, 2022 – technical visits: Leningrad NPP-2 and PJSC “Izhorskiye Zavody”

The purpose of the Conference – is to consider how to develop and strengthen technical and scientific capabilities to achieve enhanced nuclear and radiation safety and security of facilities and activities