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*The Federal Environmental, Industrial  
and Nuclear Supervision Service of Russia*

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***ANNUAL REPORT  
ON ACTIVITIES OF THE FEDERAL  
ENVIRONMENTAL, INDUSTRIAL AND NUCLEAR  
SUPERVISION SERVICE  
IN 2013***

*Moscow*

*2014*

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## ***INTRODUCTION***

This Report provides information on the activities of the Federal Environmental, Industrial and Nuclear Supervision Service (here below called Rostekhnadzor) in the year 2013, which relates to the sphere of activities, main tasks and authorities of Rostekhnadzor; management and organizational structure of Rostekhnadzor system; the status and ways of enhancing the legal basis of the Rostekhnadzor activities; the status of control, supervisory, licensing and permitting activities of Rostekhnadzor; analysis (assessment) of safety and emergency vulnerability of the productions and facilities supervised by Rostekhnadzor; results of expert review activities; the status of registration of hazardous production facilities and declaration of industrial safety; main results of scientific and technical support of Rostekhnadzor activities; public awareness of Rostekhnadzor activities; Rostekhnadzor international cooperation with foreign countries and international organizations; personnel policy of Rostekhnadzor; information and technical support and financing of Rostekhnadzor activities.

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## ***I. GENERAL CHARACTERISTICS OF THE FEDERAL ENVIRONMENTAL, INDUSTRIAL AND NUCLEAR SUPERVISION SERVICE OF RUSSIA***

### ***1.1. Objectives and Main Areas of Activities***

The Federal Environmental, Industrial and Nuclear Supervision Service was formed under Decree of the President of the Russian Federation No. 649 of 20.05.04 "Issues of Structure of Federal Executive Power Authorities" by transforming the Federal Industrial Supervision Service and the Federal Nuclear Supervision Service into the Federal Environmental, Industrial and Nuclear Supervision Service.

The Federal Environmental, Industrial and Nuclear Supervision Service is subordinated to the Government of the Russian Federation. Under the Provisions on the Federal Environmental, Industrial and Nuclear Supervision Service approved by Decree dated 30.07.2004 No. 401 of the Government of the Russian Federation, the Federal Environmental, Industrial and Nuclear Supervision Service is a federal executive authority which performs the functions of development and implementation of governmental policy and regulatory legal control in the established sphere of activity, and also in the sphere of technological and nuclear supervision, the functions of control and supervision in the sphere of safe operations connected with the use of mineral wealth, industrial safety, safety in atomic energy utilization (excluding the activities of development, manufacture, testing, operation and utilization of nuclear weapons and military nuclear power installations), safety of electrical and heat installations and networks (except for domestic installations and networks), safety of hydraulic structures (except for navigation hydraulic facilities), safety of production, storage and use of industrial explosive materials and also special functions in the field of state security in the above mentioned sphere.

The Federal Environmental, Industrial and Nuclear Supervision Service is:

the authorized state safety regulatory authority for atomic energy use (the federal state supervision authority in the field of atomic energy use);

authorized body in the field of industrial safety (the federal state supervisory body in the field of industrial safety);

state mining supervision authority;

federal state energy supervision authority;

federal state construction supervision authority;

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regulatory authority according to the Convention on Nuclear Safety and Joint Convention on Safe Management of Spent Nuclear Fuel and Safe Management of Radioactive Waste, as well as competent authority of the Russian Federation according to the Amendment to Convention on Physical Protection of Nuclear Material.

Inasmuch as it concerns the functions in the established sphere of activities, the Federal Environmental, Industrial and Nuclear Supervision Service exercises the powers of the bodies which act in the international agreements of the Russian Federation as the bodies taking the necessary measures aimed at fulfillment of the obligations of the Russian Federation ensuing from the above mentioned agreements.

The Federal Environmental, Industrial and Nuclear Supervision Service is governed in its activity by the Constitution of the Russian Federation, federal constitutional laws, federal laws, acts of the President of the Russian Federation and the Government of the Russian Federation, international agreements of the Russian Federation, as well as the Provisions on the Federal Environmental, Industrial and Nuclear Supervision Service.

Federal Environmental, Industrial and Nuclear Supervision Service carries out its activity directly and through its territorial bodies in cooperation with other federal governmental authorities, governmental authorities of the constituent entities of the Russian Federation, local governments, public associations and other organizations.

Federal Environmental, Industrial and Nuclear Supervision Service of Russia introduces to the Government of the Russian Federation draft federal laws, regulatory legal acts of the President of the Russian Federation and the Government of the Russian Federation as well as other documents that require decision of the Government of the Russian Federation on the subjects related to the sphere of activity of the Service, and also draft annual plan and prognostic indicators of the Service activity. By virtue and in pursuance of the Constitution of the Russian Federation, federal constitutional laws, federal laws, acts of the President of the Russian Federation and the Government of the Russian Federation, Federal Environmental, Industrial and Nuclear Supervision Service of Russia adopts independently the following regulatory legal acts in the established sphere of activities: federal codes and regulations in the field of atomic energy use according to the legislation of the Russian Federation;

procedure of issuing permits granting the right to work in the field of atomic energy use to employees of nuclear facilities, in compliance with the positions list approved by the Government of the Russian Federation; requirements to structure and contents of documents justifying safety assurance of nuclear installations, radiation sources, nuclear materials and radioactive substances storage facilities, radioactive waste storage facilities and/or safety assurance of activity in the field of atomic energy use, as those requirements are needed for licensing of activities in this field, as well as review procedure of the above mentioned documents;

procedure for the operating organization on submission to the authorized state safety regulatory authority for atomic energy use of documents with the results of safety assessment of a nuclear installation, nuclear materials and radioactive substances storage facility;

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radioactive waste storage facility and documents justifying their safe operation, as well as requirements to structure and contents of these documents;

procedure for conducting safety review (safety analysis review) of nuclear facilities and (or) kinds of activities in the field of atomic energy use;

procedure for arrangement and implementation of supervision over the state nuclear material control and accounting system;

requirements for registration of facilities in the state register of hazardous industrial facilities and for maintaining of this register;

procedure for preparation of the declaration on industrial safety of hazardous industrial facilities and a list of the data to be included in the declaration;

procedure for technical investigation of the causes of accidents, incidents and cases of losses of industrial-purpose explosive materials;

form of the safety declaration for hydraulic engineering structures;

procedure for formation and rules of work of the expert review commissions on the state review of safety declarations for hydraulic engineering structures;

procedure for filing and record keeping while executing the state civil construction supervision; the requirements imposed on the documents which are included in such files;

the form of competency certificate for a certain type or types of activities related to safety of capital construction facilities;

codes of rules in compliance with the legislation of the Russian Federation on technical regulation;

methods of development and establishing of the limits of maximum permissible radioactive releases to atmospheric air and the limits of permissible discharges of radioactive substances to water reservoirs;

procedures for the issuing and the form of permits for discharges and releases of radioactive substances;

federal codes and regulations in the field of industrial safety;

procedure for agreement on the limits of security areas for electrical supply network facilities;

specific features of compliance assessment for the products covered by the requirements related to safety assurance in the field of atomic energy use, and also their design practices (including survey), production, construction, installation, pre-commissioning, operation, storage, transportation, disposal, removal and burial;

regulatory legal acts on other issues in the established sphere of activities except for the issues, which are legally regulated as per the Constitution of the Russian Federation and federal constitutional laws, federal laws, acts of the President of the Russian Federation and the Government of the Russian Federation solely by federal constitutional laws, federal laws, regulatory legal acts of the President of the Russian Federation and the Government of the Russian Federation.

Basing on the federal laws, acts of the President of the Russian Federation and the Government of the Russian Federation the Federal Environmental, Industrial and Nuclear Supervision Service of Russia exercises control and supervision over observance of the codes and standards in the field of atomic energy, validity conditions of the permits (licenses) for the right to carry out activities in the field of atomic energy;

nuclear, radiation, technical and fire safety (at nuclear facilities);

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physical protection of nuclear installations, radiation sources, storage facilities for nuclear materials and radioactive substances, systems of unified state control and accounting of nuclear materials, radioactive substances and radioactive waste;

fulfillment of international commitments of the Russian Federation in the field of safety assurance in atomic energy use;

compliance with industrial safety requirements for design, construction, operation, preservation and liquidation of hazardous industrial facilities, for manufacture, assembling, adjustment, maintenance and repairs of the equipment used at hazardous industrial facilities, for transportation of dangerous substances that are used at hazardous industrial facilities;

observance, within its sphere of competence, of safety requirements in electric power engineering;

safe conduct of activities related to the use of mineral wealth;

observance of fire safety requirements for underground facilities and blasting operations;

observance by owners of hydraulic engineering structures and operating organizations of safety standards and rules for hydraulic engineering structures (other than navigation hydraulic engineering structures);

observance, within its competence, of the requirements of the law of the Russian Federation in the field of radioactive waste management;

timely return of irradiated fuel assemblies of nuclear reactors and their processing products to the vendor country, with which the Russian Federation has an international contract providing for import to the Russian Federation of irradiated fuel assemblies of nuclear reactors for temporary technological storage and processing on a product return basis (within its sphere of competence);

observance, within its sphere of competence, by owners of non-residential buildings, structures and installations of the requirements for energy efficiency imposed on such buildings, structures and installations in the course of their operation; as well as observance of the requirements for equipping them with devices for accounting the energy resources consumed;

observance of the requirement to adopt programs in the field of power saving and improving energy efficiency by legal entities in whose charter capital the share (interest) of the Russian Federation, constituent entity of the Russian Federation, municipality makes over 50 percent and/or concerning which the Russian Federation, constituent entity of the Russian Federation of the Russian Federation, municipality have the right to directly or indirectly be in command of over 50 percent total votes attaching to voting shares (stock), which constitute charter capital of such legal entities, by state and municipal unitary enterprises, state and municipal organizations, state companies, state corporations, as well as by legal entities, whose property or over 50 percent shares or interest in the charter capital belong to state corporations;

conducting obligatory energy surveillance on the established dates;

observance of the requirements of technical regulations in the established sphere of activity;

carries out licensing of the activities in the field of atomic energy use and licensing of other activities within the sphere of competence of the Service in accordance with the legislation of the Russian Federation.

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The Federal Environmental, Industrial and Nuclear Supervision Service grants permits for:

- the right to conduct activities in the field of atomic energy use for employees of nuclear facilities;

- operation of supervised hydraulic engineering structures;

- radioactive releases and discharges to the environment;

- use of industrial-purpose explosive materials and operations involving the above mentioned materials;

- operation of power receivers of electric power consumers, power generating facilities, and also power grid facilities that belong to electrical grid organizations and other entities (in the cases provided for by regulatory legal acts of the Russian Federation).

The Federal Environmental, Industrial and Nuclear Supervision Service: establishes the limits of maximum permissible radioactive releases to atmospheric air and the limits of permissible discharges of radioactive substances to water reservoirs;

- registers hazardous industrial facilities and maintains the state register of such facilities;

- performs audits (inspections) to make sure that the requirements of the law of the Russian Federation, regulatory legal acts, codes and standards in the established sphere of activities are followed by legal entities and physical bodies.

The Federal Environmental, Industrial and Nuclear Supervision Service approves:

- registers of managers and specialists (departmental officers) job positions, which define qualification requirements for employees to obtain permits for activities in the field of atomic energy use;

- lists of radioisotope products whose import and export are not subject to

- licensing; rules of operation for hydraulic engineering structures;

- the limits of security areas for electrical supply network facilities.

The Federal Environmental, Industrial and Nuclear Supervision Service:

- arranges and ensures the functioning of the nuclear facilities monitoring system in case of accidents;

- establishes, develops and supports the functioning of the automated information and analytical system, which serves, among other things, the purposes of the unified state automated system of radiation situation monitoring in the territory of the Russian Federation;

- directs the activities of the functional subsystems for monitoring of chemically hazardous and highly explosive facilities, as well as for nuclear- and radiation hazardous facilities as part of the unified state system for prevention and elimination of emergencies;

- according to the procedure established by the legislation of the Russian Federation, places orders and makes government contracts, as well as other civil agreements for the supplies of goods, execution of works, delivery of services to meet the needs of the Service, as well as for research and development works for the state needs in the specified sphere of activities;

- issues conclusion on the conformance of a constructed, reconstructed, repaired capital construction project to the requirements of process regulations and design documentation;

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approves safety declarations of supervised hydraulic engineering structures prepared at the operation, decommissioning stages of hydraulic engineering structure, and after its reconstruction, overhaul, restoration or preservation;

generalizes practices of administration of the laws of the Russian Federation in the established sphere of activity;

develops, approves and puts into effect the safety guides for atomic energy use (to the extent of its competence);

participates in the accreditation activities in the field of atomic energy use; receives and accounts for the notifications on the beginning by legal entities and individual entrepreneurs of certain types of works and services according to the index approved by the Government of the Russian Federation;

maintains the register of industrial safety declarations;

maintains the register of conclusions of industrial safety reviews;

functions as the main administrator and recipient of the federal budget funds allocated for maintenance of the Service and implementation of the functions assigned to the Service;

arranges reception of citizens, ensures timely and thorough consideration of verbal and written applications of citizens, relevant decision-making and making replies to the applicants within the dates established by the legislation of the Russian Federation;

ensures (within its sphere of competence) protection of information classified as state secret;

ensures mobilization preparedness of the Service, as well as monitoring and coordination of activities of supervised organizations in respect of their mobilization preparedness;

organizes and maintains civil defense in the Service, and also controls and coordinates the actions of subordinated organizations to implement their powers in the field of civil defense;

organizes additional professional education of the Service employees;

establishes the procedure and dates for evaluation of candidates for the position of the head of educational organization subordinated to the Service and heads of the said organizations;

cooperates according to the established procedure with the public authorities of foreign countries and international organizations in the specified sphere of activities;

according to the legislation of the Russian Federation, carries out activities related to compilation, storage, accounting and utilization of the archive documents generated in the course of the Service's activity;

exercises other authorities in the specified sphere of activities if such authorities are envisaged by the federal laws, regulatory legal acts of the President of the Russian Federation or the Government of the Russian Federation.

## ***1.2. Organizational Structure of the Federal Environmental, Industrial and Nuclear Supervision Service***

In 2013 the Federal Environmental, Industrial and Nuclear Supervision Service of Russia has preserved its two-tier management system (headquarters - territorial bodies of federal subordination), which was formed in 2009.

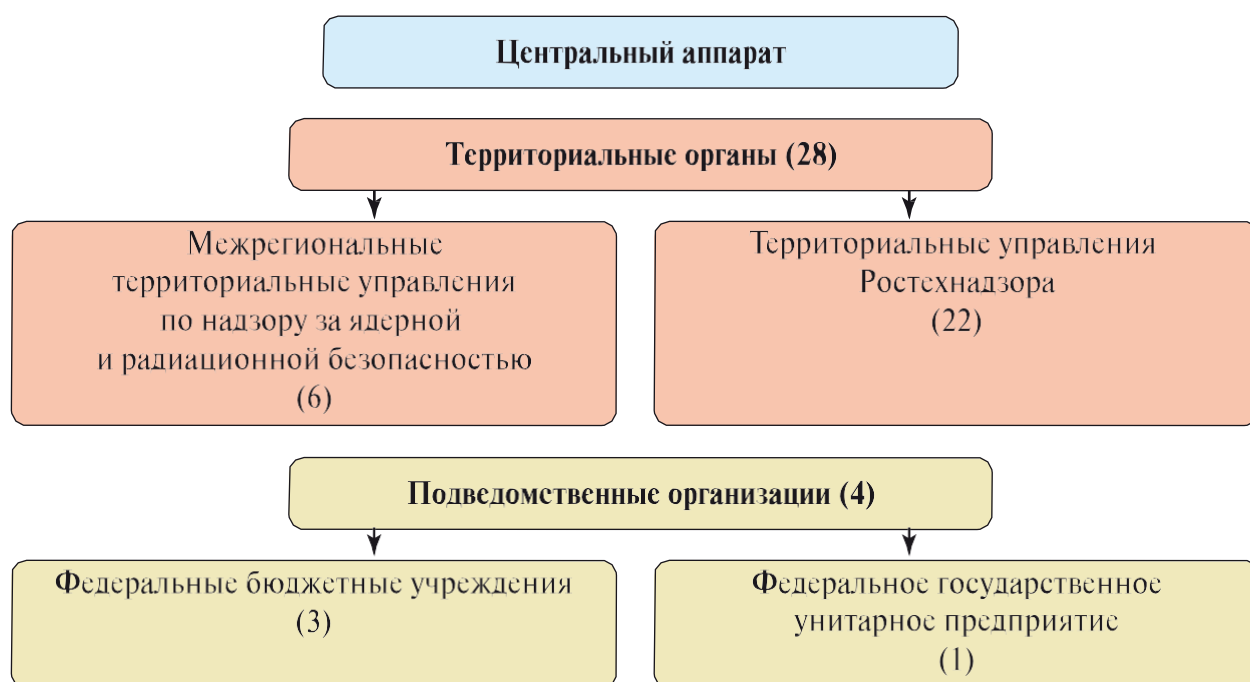
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Division of authorities and the current organizational structure of Rostekhnadzor territorial bodies and headquarters create the conditions ensuring a comprehensive approach to the organization of supervision activities, avoiding internal duplication of functions, strengthening control and coordination of activities of Rostekhnadzor's territorial departments.

In 2013 the organizational structure of Rostekhnadzor included 16 structural divisions of the headquarters, 6 interregional territorial departments for nuclear and radiation safety supervision and 22 territorial departments for industrial and environmental supervision at interregional and regional levels.

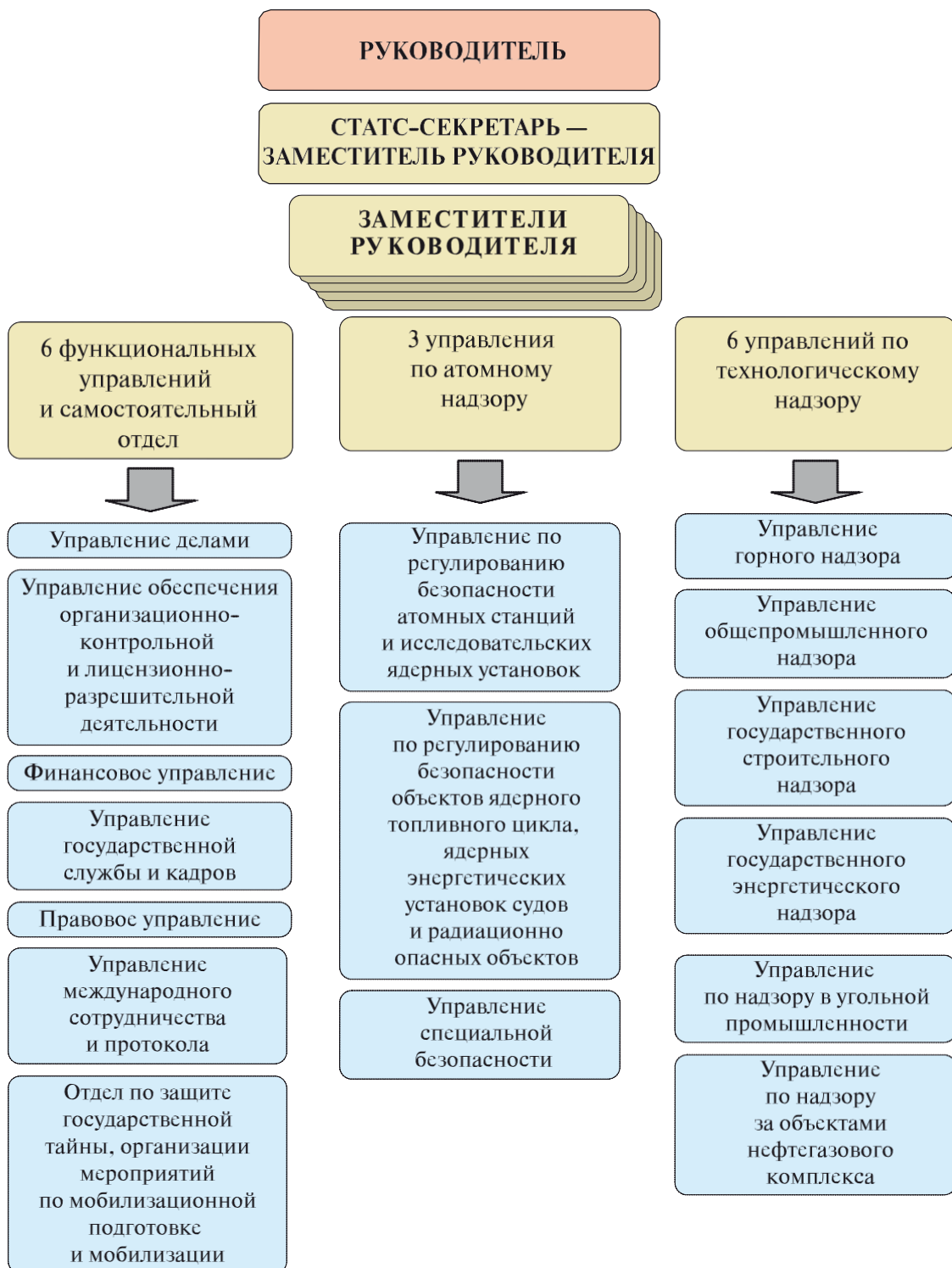
Organizational Structure of the Federal Environmental, Industrial and Nuclear Supervision Service effective in 2013 is shown in Fig. 1.



**Fig. 1.** Organizational Structure of the Federal Environmental, Industrial and Nuclear Supervision Service

In order to provide for the implementation of the authority assigned to Rostekhnadzor, the structural units of the headquarters are arranged by disciplines. In 2013, the structure of the headquarters comprised 7 general-purpose structural units (6 departments and an autonomous division), 3 nuclear supervision departments and 6 industrial supervision departments.

Organizational Structure of the Headquarters of the Federal Environmental, Industrial and Nuclear Supervision is shown in Fig. 2.



**Fig. 2.** Organizational Structure of the Headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service

The 2013 arrangement scheme of territorial authorities of the Federal Environmental, Industrial and Nuclear Supervision Service was approved by the order of the Government of the Russian Federation dated 5th October 2012 No.1846-r and included interregional territorial departments for nuclear and radiation safety supervision, and also territorial departments for technological and environmental supervision at the interregional and regional levels.

*The structure and location of the territorial bodies of the Federal Environmental,  
Industrial and Nuclear Supervision Service*

***Central Federal District***

1. Central Interregional Territorial Department for nuclear and radiation safety supervision of the Federal Environmental, Industrial and Nuclear Supervision Service, Moscow.
2. Interregional Industrial Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Moscow (Moscow - a city of federal importance, Chukotka Autonomous Region, Norilsk and adjoining territories).
3. Federal Environmental, Industrial and Nuclear Supervision Service Headquarters, Moscow (Moscow, Smolensk, Tver, Kaliningrad, Vladimir, Ivanov, Kostroma and Jaroslavl regions).
4. Upper Don Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Voronezh (Belgorod, Voronezh, Kursk, Lipetsk and Tambov regions).
5. Oka Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Tula (Bryansk, Kaluga, Orel, Ryazan and Tula regions).

***Northwestern Federal District***

6. North-European Interregional Territorial Department for nuclear and radiation safety supervision of the Federal Environmental, Industrial and Nuclear Supervision Service, Saint Petersburg.
7. North-Western Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Saint Petersburg (St. Petersburg - a city of federal importance, Republic of Karelia, Leningrad, Novgorod, Pskov, Murmansk, Arkhangelsk and Vologda regions).
8. Pechora Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Syktyvkar (Republic of Komi, Nenets Autonomous District).

***South Federal District***

9. Don Interregional Territorial Department for nuclear and radiation safety supervision of the Federal Environmental, Industrial and Nuclear Supervision Service, Novovoronezh, Voronezh region.
  10. Lower Volga Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Volgograd (Republic of Kalmykia, Astrakhan, Volgograd, Saratov and Penza regions).
  11. North Caucasus Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Krasnodar (Krasnodar Territory, Republic of Adygeya, Rostov region).
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### ***North Caucasian Federal District***

12. Caucasus Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Pyatigorsk (Stavropol Territory, Kabardino-Balkarian Republic, the Karachayevo-Cherkessian Republic, Republic of Dagestan, Republic of Ingushetia, Republic of North Ossetia-Alania, Chechen Republic).

### ***Privolzhsky Federal District***

13. Volga Interregional Territorial Department for nuclear and radiation safety supervision of the Federal Environmental, Industrial and Nuclear Supervision Service, Balakovo, Saratov region.

14. Volga-Oka Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Nizhny Novgorod (Nizhny Novgorod Region, Republic of Mordovia).

15. Western-Ural Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Perm (Perm Territory, Republic of Udmurtia, Republic of Bashkortostan, Kirov and Orenburg regions).

16. Middle Volga River Basin (Middle-Povolzhiye) Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Samara (Samara and Ulyanovsk regions).

17. Volga Area Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Kazan (Republic of Tatarstan (Tatarstan), Republic of Mari El, Chuvash Republic - Chuvashia).

### ***Urals Federal District***

18. Urals Interregional Territorial Department for nuclear and radiation safety supervision of the Federal Environmental, Industrial and Nuclear Supervision Service, Yekaterinburg.

19. North-Ural Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Tyumen (Tyumen region, Khanty-Mansi Autonomous Area - Yugra, Yamalo-Nenets Autonomous District).

20. Urals Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Yekaterinburg (Kurgan, Sverdlovsk and Chelyabinsk regions).

### ***Siberian Federal District***

21. Siberia and Far East Interregional Territorial Department for nuclear and radiation safety supervision of the Federal Environmental, Industrial and Nuclear Supervision Service, Novosibirsk (Siberian and Far Eastern Federal Districts).

22. Trans-Baikal Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Chita (Trans-Baikal Territory, Republic of Buryatia),

23. Yenisei Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Krasnoyarsk (Krasnoyarsk Territory (without Norilsk and its surrounding territories), Republic of Tuva, Republic of Khakasia, Irkutsk Region).

24. Siberian Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Kemerovo (Altai Territory, Republic of Altai, Kemerovo, Novosibirsk, Omsk and Tomsk regions).

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***Far Eastern Federal District***

25. Far-Eastern Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Khabarovsk (Primorye Territory, Khabarovsk Territory, Kamchatka Territory, Amur region, Jewish Autonomous Region, Northern Kuril Islands (Paramushir, Shumshu) of Sakhalin region).

26. Lena Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Yakutsk (Republic of Sakha (Yakutia)).

27. Sakhalin Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Yuzhno-Sakhalinsk (Sakhalin region).

28. North-Eastern Department of the Federal Environmental, Industrial and Nuclear Supervision Service, Magadan (Magadan region).

*Organizations Subordinated to the Federal Environmental, Industrial and Nuclear Supervision Service*

***Federal State Unitary Enterprise (FSUE)***

1. FSUE VO "Safety", Moscow.

***Federal budgetary enterprises (FBE)***

1. Scientific and Engineering Center for Nuclear and Radiation Safety, Moscow.
2. Scientific Engineering Center "Energobezopasnost (Energy Safety)", Moscow
3. Federal State Budgetary Educational Enterprise "Educational and Methodological Cabinet", Moscow.



## **II. REGULATORY ACTIVITIES**

### **2.1. Regulatory control**

*Legislative and regulatory legal acts enacted in 2013 in the established sphere of activity of Rostekhnadzor by directions of activity and types of supervision*

According to article 1 of the Federal Law of 21.11.1995 No.170-FZ On Atomic Energy Use (hereinafter called Federal Law No. 170-FZ) the legislation of the Russian Federation in the field of use of atomic energy is based on the Constitution of the Russian Federation, commonly recognized principles and standards of the international law and international treaties of the Russian Federation in the field of use of atomic energy for peaceful and defense purposes. The legislation consists of the Federal Law, other federal laws and other regulatory legal acts of the Russian Federation based on them. Requirements to the safe use of atomic energy, including requirements to safety of nuclear facilities, requirements to safety of activities in the field of atomic energy use, including objectives, principles and criteria of safety, which are obligatory for carrying out activities in the field of atomic energy use, are established by the federal codes and regulations in the field of atomic energy use, i.e. by the regulatory legal acts developed and approved according to the procedure established by the Government of the Russian Federation.

The following legislative and regulatory legal acts were adopted *in the field of atomic energy use* in 2013.

1. Federal Law dated 5th April 2013 No.39-FZ "On introduction of changes in part two of the Tax Code of the Russian Federation and article 4 of the Federal Law "On introduction of amendments in certain legal acts of the Russian Federation in connection with the improvement of the principles of pricing for taxation purposes" (where concerns specifying the types of activities in the field of atomic energy use, the licenses for which are subject to state duty).

The changes are directed at creating conditions for the implementation of the provisions of article 26 of the Federal Law of 21 November 1995 No. 170-FZ On Atomic Energy Use (in edition of Federal Law No. 347-FZ of 30.11.2011).

It contains a list of the types of activities in the field of atomic energy use, the licenses for which are subject to state duty according to the list of the types of licensable activities in the field of atomic energy use.

Federal Law No. 347 -FZ of November 30, 2011, "On introduction of amendments in certain legal acts of the Russian federation for safety regulation in the field of atomic energy use" (Federal Law No.347-FZ) introduced changes in article 26 of the Federal Law On Atomic Energy Use aimed at establishing an exhaustive list of the types of licensable activities in the field of atomic energy use. Tax Code of the Russian Federation part two article 333<sup>33</sup> clause 1 subclause 95 contains a list of the types of activities in the field of atomic energy use, the licenses for which are subject to state duty.

Federal Law No.347-FZ was adopted before the said provisions of the Tax Code of

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the Russian Federation were made consistent with the changes introduced in the Federal Law 170-FZ On Atomic Energy Use, which stipulate that state duty should be paid for issuing a permit (license) by the state regulatory authority for the right to carry out activities in the field of atomic energy use, its reissue and extension of its valid time, according to the rate and procedure as established by the tax and duty legislation of the Russian Federation.

Under the circumstances the Federal Environmental, Industrial and Nuclear Supervision Service was practically unable to license such types of activities in the field of atomic energy use as safety review (safety analysis review) of nuclear facilities and (or) kinds of activities in the field of atomic energy use, as well as siting, construction, operation and decommissioning of radioactive waste storage facilities, closure of radioactive waste disposal facilities, which, in its turn, also created obstacles to the implementation of the provisions of the Federal Law of 11 July 2011 No.190-FZ "On radioactive waste management and introduction of changes in certain legal acts of the Russian Federation".

When adopted, the said federal law filled in the existing legal gap. The changes thus made are aimed at the improvement of state regulation of the activity related to the use of atomic energy.

2. Federal Law of 2 July 2013 No.159-FZ "On introduction of changes in articles 25 and 26 of the Federal Law On Atomic Energy Use" (where concerns improvement of safety review mechanisms for licensing the activities in the field of atomic energy use).

The changes made in the law are aimed at the improvement of safety review mechanisms for licensing the activities in the field of atomic energy use.

Article 26 of the Federal Law of 21 June 1995 No.170-FZ On Atomic Energy Use (hereinafter called the Law of Atomic Energy Use) provides for obligatory safety review (safety analysis review) of nuclear facilities and (or) activity in the field of atomic energy use before the authorized state safety regulatory body makes its decision with regard to granting a license for the right to carry out the work in the field of atomic energy use.

However, financing sources of the said review were not defined by law.

The above mentioned review is made as a rule by technical experts of specially authorized organizations (organizations of technical support to regulatory bodies), which are employed by regulatory bodies, or by their regular staff.

The changes that were introduced in the legislation clearly defined that safety review is conducted at the expense of the applicant (licensee or license applicant), which allowed to remove a number of disputable and ambiguous issues emerging when resolving such a question.

According to article 24.1 of the Law on Atomic Energy Use the Government of the Russian Federation defined a list of nuclear facilities, for which continuous state supervision regime was introduced (Government Decree No. 610-r of 23 April 2012 defined 73 legal entities, which supervise over 450 nuclear facilities, including nuclear installations, radioactive waste storage facilities, radiation sources, nuclear materials storage facilities).

Social significance and unique nature of the reviews conducted in respect of such dangerous facilities requires that highly qualified technical specialists should be involved in the process.

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The Federal Law No. 347-FZ of 30 November 2011 added a number of new provisions in the Law on Atomic Energy Use, which are aimed at the improvement of state safety regulation. In particular, taking into account European experience of functioning regulatory bodies, an institute of scientific and technical organizations was introduced to support the authorized state safety regulatory body (article 37.1 of the Law) and a range of issues were defined, whose resolution was attributed to the competence of such organizations. Safety reviews are among these issues.

Practically all regulatory bodies of European countries with mature nuclear industry have technical support organizations (France, Germany, Belgium, Finland, Ukraine).

In the above mentioned countries technical support organizations are involved, as a rule, in the reviews of extremely dangerous facilities.

The changes that were introduced established that safety review of the nuclear facilities, for which continuous state supervision regime was introduced, or activity at such facilities should be conducted by scientific and technical support organizations of the authorized state safety regulatory body. Review in respect of other nuclear facilities can be conducted by any organization having an appropriate permit (license).

At the same time, taking into account regulatory body authorities established by article 25 of the Law on Atomic Energy Use, safety reviews should be arranged by authorized state safety regulatory bodies.

Such mechanisms in general correspond not only to the world practices, but also to the acting regulatory legal acts that regulate the issues of licensing in the field of atomic energy use and conducting safety reviews.

The said changes are also aimed at the elimination of the existing legal gaps in the regulation of the relations connected with the definition of safety review financing sources.

3. Decree of the Government of the Russian Federation No. 280 of 29 March 2013;
4. "On the approval of the Licensing Provisions in the field of atomic energy use".
5. Decree of the Government of the Russian Federation of 29 April 2013
6. No.362 "On the definition of specific features of technical regulation in the field of atomic energy use".
7. Decree of the Government of the Russian Federation No. 387 of 30 April 2013
8. "On the establishment of a procedure for qualifying a legal entity as a technical support organization for an authorized state safety regulatory body in atomic energy use".
9. Decree of the Government of the Russian Federation No. 1225 of 25 January 2013 "On introduction of changes in certain acts of the Government of the Russian Federation".
10. Decree of the Government of the Russian Federation No. 612 of 20 July 2013 "On accreditation in the field of atomic energy use" establishing a procedure for accreditation of certification bodies and test laboratories (Centers) working on justification of compliance with obligatory requirements of the products for which safety requirements are established in connection with safety assurance in the field of atomic energy use (hereinafter referred to as products), certification of accreditation experts in the field of atomic energy use, and engagement and recruiting of accreditation experts in the field of atomic energy use and technical

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experts to work on accreditation.

11. Decree of the Government of the Russian Federation No. 698 of 14 August 2013 "On the approval of the Provisions for alienation of radioactive waste disposal facilities owned by legal entities to the ownership of state control body in the field of radioactive waste management".

12. Decree of the Government of the Russian Federation No. 173 of 1 March 2013 "On the approval of the Provisions for specific standardization of the products (works, services) for which safety requirements are established in connection with safety assurance in the field of atomic energy use, as well as design processes (including survey), production, construction, installation, pre-commissioning, operation, storage, transportation, distribution, disposal and burial of the said products".

13. Decree of the Government of the Russian Federation No. 759-r of 8 May 2013 "On the receipt in 2013 by the Russian Federation of the International Atomic Energy Agency mission to review the implementation of recommendations of the November 2009 mission to evaluate the efficiency of the state safety regulatory body in atomic energy use".

The following Administrative Regulations in the field of atomic energy use were approved in 2013.

1. Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service to perform its state function of federal state supervision in the field of atomic energy use (approved by the Order of Rostekhnadzor of 7 June 2013 No.248).

2. Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service to provide its state service of licensing activities the field of atomic energy use (approved by the Order of Rostekhnadzor of 27 January 2013 No.644).

3. Changes were introduced in the Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service to provide its state service of issuing permits for the right to work in the field of atomic energy use (changes in the Administrative Regulations were approved by the Order of Rostekhnadzor of 25 March 2013 No.119).

Apart from that, in 2013 Federal codes and regulations in the field of atomic energy use were adopted, "Regulations for transferring nuclear materials to the category of radioactive" of 5 July 2013 No. 288 (registered with the Ministry of Justice of Russia on 2 October, 2013 No. 30082 of December 30, 2013).

*Participation in the development and approval of legislative and regulatory legal acts of the Russian Federation including action plans and programs of the Government of the Russian Federation*

In 2013 Rostekhnadzor took part in the agreement of the following draft laws and draft regulatory legal acts of the Russian Federation:

draft federal law "On introduction of changes in article 40 of the Federal Law "On Environmental Protection";

draft federal law "On introduction of changes in article 60 of the Water Code of the Russian Federation" where concerns repeal of the ban on designing once-through water supply systems for nuclear facilities;

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draft federal law "On introduction of changes in certain legal acts of the Russian Federation", aimed at the clarification of the scope of industrial safety legislation in respect of hazardous production facilities located inside the limits of nuclear facilities; draft federal law "On introduction of changes in the Federal Law of 27 July 2010 No.190-FZ "On heat supply";

draft federal law "On introduction of changes in the Federal Law "On atomic energy use" prepared by the State Corporation 'Rosatom'" basing on the Federal Law No.317-FZ dated 01.12.2007, article 8, "On the State Atomic Energy Corporation 'Rosatom'";

draft decree of the Government of the Russian Federation "On specific compliance assessment of the products for which requirements are established in connection with safety assurance in the field of atomic energy use" in the framework of implementation of the Plan for preparation of draft regulatory legal acts required for the implementation of the Federal Law of 30 November 2011 No.347-FZ notified by the direction of the Government of the Russian Federation of 2 June 2012 No.RD-P7-3115. According to article 1 of the Law of the Russian Federation of 21 February 1992 No.2395-1 "On subsoil resources" the subsoil legislation of the Russian Federation is based on the Constitution of the Russian Federation and consists of the above mentioned Law acting on the whole territory of the Russian Federation and also regulating the subsoil use relations on the continental shelf of the Russian Federation according to the federal legal acts on the continental shelf and norms of the international law, and also other federal laws and other regulatory legal acts, laws and other regulatory legal acts of the constituent entities of the Russian Federation that are adopted in line with the above mentioned Law.

The following legislative and regulatory legal acts were adopted *in the field of state mining supervision* in 2013:

Federal Law of 28 December 2013 No.408-FZ "On introduction of changes in the Law of the Russian Federation "On subsoil resources" and invalidation 3.6 of item 3 of the Provision on licensing procedure for the use of subsoil resources approved by the Decree of the Supreme Soviet of the Russian Federation "On the enforcement of the Provision on subsoil use licensing procedure" (where concerns regulations in respect of preparation and agreement of plans and schemes of development of mining operations, preparation of the documents certifying specified limits of mining allotment).

The changes introduced in the Law of the Russian Federation "On subsoil resources" serve the purpose of regulating preparation and agreement of mining development plans, preparation of the documents certifying specified limits of mining allotment. The Law of the Russian Federation "On subsoil resources" article 22 part 2 clause 2 establishes the obligation of the user of mineral resources to ensure that mining development plans should be fulfilled.

The Law of the Russian Federation "On subsoil resources" article 24, part 5, subclauses 5, 8, 9, 10 establishes the principle requirements for ensuring safe operations, which include the obligations of the mineral resources user to control deformation processes of the rock mass, conduct a complex of observations sufficient for ensuring a normal technological work cycle and foreseeing dangerous situations, timely identify and indicate dangerous areas in the mining plans, take special measures for predicting and preventing rock burst, sudden gas release,

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breakthrough of water, subsoil and rock, develop and take measures ensuring protection of workers of the enterprises involved in the subsoil use-related operations and population in the areas affected by these operations. The above mentioned operations are included in the mining development plans and schemes.

However, no procedure for the preparation, review and agreement of mining development plans was defined by legislation on the use of subsoil resources.

A similar situation existed in connection with the documents certifying the specified limits of the mining allotment.

The changes that were introduced in the above mentioned law made it possible to establish that measures to fulfill the principle requirements for assuring safe operations related to the use of subsoil resources shall be included in mining development plans, which are subject to agreement with state mining supervision authorities. Establishment of a procedure for preparation and agreement of mining development is a responsibility of the Government of the Russian Federation. It is also established that state mining supervision bodies or executive authorities of the constituent entities of the Russian Federation, which have custody of local sites of subsoil resources, are obligated to make the documents certifying specified limits of the mining allotments according to the procedure established by the Government of the Russian Federation, and in respect of local sites of subsoil resources according to the procedure established under the legislation of the constituent entities of the Russian Federation.

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*Regulatory legal acts in the sphere of federal state energy supervision and  
hydraulic engineering structures safety supervision*

Relations in the sphere of state energy supervision and hydraulic engineering structures safety supervision are regulated by the Federal Law of 26 March 2003 No.35-FZ "On electric power industry", Federal Law of 21 July 1997 No.117-FZ "On safety of hydraulic engineering structures", Provision on the federal state energy supervision approved by Decree of the Government of the Russian Federation of 20 July 2013 No.610, Provision on the regime of continuous state supervision at hazardous production facilities and hydraulic engineering structures approved by Decree of the Government of the Russian Federation of 5 May 2012 No.455, Provision on the federal state supervision in the field of safety of hydraulic engineering structures approved by Decree of the Government of the Russian Federation of 27 October 2012 No.1108.

In 2013 in the sphere of federal state energy supervision Rostekhnadzor worked to prepare the following legal acts:

- draft federal law "On the introduction of changes in the Federal Law "On electric power industry";

- draft federal law "On the introduction of changes in the Federal Law "On heat supply";

- draft federal law "On the introduction of changes in certain legislative acts of the Russian Federation on the issues of hydraulic engineering structures safety assurance";

- draft Decree of the Government of the Russian Federation "On the classification of hydraulic engineering structures";

- draft Rostekhnadzor order "On the approval of a form for the pre-declaration hydraulic engineering structures survey report (except for navigation hydraulic structures)";

- draft Rostekhnadzor orders "On approval of qualification requirements to the specialists of expert review commissions on the state review of safety declarations for hydraulic engineering structures" and "On the procedure of formation and rules of work of the expert review commissions on the state review of safety declarations for hydraulic engineering structures";

- draft Decree of the Government of the Russian Federation "On the introduction of changes in the Decree of the Russian Federation of 28 October 2009 No.846 "On the approval of the Regulations on investigation of accidents in electric power industry". In 2013 the following legislative and regulatory legal acts were adopted in the sphere of federal state energy supervision and hydraulic engineering structures supervision:

1. Federal Law of 25 November 2013 No.316-FZ "On the introduction of changes in the Code of Administrative Offenses of the Russian Federation articles 7.19 and 9.11" (where concerns strengthening administrative responsibility).

The changes that were introduced are aimed at strengthening administrative responsibility for distortion by citizens, legal entities and officials of metered resource consumption values.



Administrative responsibility was strengthened for the following offenses:

committing the offense provided for by the Code of Administrative Offenses of the Russian Federation article 7.19 (unauthorized connection to power grids, oil products lines and gas lines, and equally unauthorized (off-the-meter) use of electric, thermal energy, oil, gas or oil products);

committing the offense provided for by the Code of Administrative Offenses of the Russian Federation article 9.11 (violation of regulations for using fuel and energy, regulations for construction and operation of fuel and energy consuming installations, heating grids, facilities for storage, maintenance, distribution and transportation of energy, fuel and fuel processing products).

The Code of Administrative Offenses of the Russian Federation articles 23.30 и 28.3 stipulates that administrative offense reports under articles 7.19 (in respect of officials and legal entities) and 9.11 of the Code of Administrative Offenses of the Russian Federation shall be made by officials of the state energy supervision body.

In accordance with the Code of Administrative Offenses of the Russian Federation article 28.3 administrative offense reports under article 7.19 of the Code of Administrative Offenses of the Russian Federation shall be made by officials of internal affairs bodies (police).

Statistical analysis has shown that the number of punishments in administrative offense cases under the Code of Administrative Offenses of the Russian Federation articles 7.19 and 9.11 is constantly growing.

2. Federal Law No. 445 -FZ of 28 January 2013 "On the introduction of changes in certain legislative acts of the Russian Federation on the issues of hydraulic engineering structures safety assurance".

Changes in the legislation in the sphere of supervision of hydraulic engineering structures are aimed at improvement of the legislation on safety of hydraulic engineering structures in order to lower the risks of extraordinary man-caused situations and reduce the number of abandoned hydraulic engineering structures.

The scope of Federal Law of 21 July 1997 No.117-FZ "On safety of hydraulic engineering structures" was specified, in particular, the meaning of "operating organization" was clearly defined, and such basic terms were introduced as "decommissioning of hydraulic engineering structures", "preservation of hydraulic engineering structures", "liquidation (demolition) of hydraulic engineering structures" and "abandoned hydraulic engineering structures".

The powers of the public authorities of the Russian Federation and public authorities of constituent entities of the Russian Federation were specified in terms of safety of hydraulic engineering structures, in particular, changes were introduced in the Federal Law "On safety of hydraulic engineering structures" article 4, which establish authorities of federal executive bodies in respect of state safety regulation of hydraulic engineering structures. For the purposes of legal regulation of the relations connected with the activities of preservation and liquidation of hydraulic engineering structures including abandoned structures and their safety assurance, it was established that the Government of the Russian Federation defines the procedure of preservation and liquidation of hydraulic engineering installations.

For the purposes of legal regulation of the relations connected with the activities of preservation and liquidation of hydraulic engineering structures including abandoned structures, the law contains a relative article 12.1 "Preservation and liquidation (demolition) of hydraulic engineering structures", which sets out general provisions for preservation and liquidation of hydraulic engineering structures.

Changes in the law tightened requirements to hydraulic engineering structures safety assurance, in particular, the Federal Law "On safety of hydraulic engineering structures" article 9 regulates that approval of operation regulations for hydraulic engineering structures is one of the authorities of the federal executive body authorized to conduct federal state supervision in the field of safety of hydraulic engineering structures. At the same time responsibility for the activities related to capital repairs, preservation or liquidation (demolition) of abandoned hydraulic engineering structures rests with the executive bodies of constituent entities of the Russian Federation in whose territory these structures are located, for the purpose of assuring their safety.

Article 14 establishes the powers of the federal executive body authorized to exercise federal state supervision in the field of safety of hydraulic engineering structures in case an abandoned hydraulic engineering structure is identified.

The changes introduced in the Federal Law of 6 October 1999 No.184-FZ "On general principles for foundation of legislative (representative) and executive public authorities of the subjects of the Russian Federation" extended the powers of public authorities of constituent entity of the Russian Federation to resolving the problems of hydraulic engineering structures safety assurance in line with the legislation on safety of hydraulic engineering structures.

3. Decree of the Government of the Russian Federation No. 610 of 20 July 2013 "On federal state energy supervision".

4. Decree of the Government of the Russian Federation of 2 November 2013 No. 986 «On classification of hydraulic engineering structures».

5. Decree of the Government of the Russian Federation No. 245 of 20 March 2013 "On introduction of changes in the Provisions on the Federal Environmental, Industrial and Nuclear Supervision Service".

#### *Regulatory legal acts in the sphere of industrial safety*

Legal, economic and social foundations for safe operation of hazardous production facilities are laid down in the Federal Law of 21 July 1997 No.116-FZ "On industrial safety of hazardous industrial facilities". Requirements of the law are focused on accident prevention at hazardous industrial facilities and preparedness of the legal entities and individual entrepreneurs operating hazardous industrial facilities for localization and liquidation of the said accident effects.

The following regulatory legal acts were adopted during 2013 in order to improve the legislation in the sphere of industrial safety.

1. Federal Law of 4 March 2013 No.22-FZ "On introduction of changes in the Federal Law "On industrial safety of hazardous industrial facilities", some legislative acts of the Russian Federation and on

invalidation of Tax Code of the Russian Federation Part II Article 333<sup>33</sup> item 1 sub-item 114" (where concerns improvement of controlling and supervisory functions and optimization of public services).

The main objective of the changes introduced by the above mentioned Federal Law is comprehensive improvement of the legislation of the Russian Federation in the sphere of safety of hazardous industrial facilities in order to raise the efficiency of legal regulation, remove excessive administrative barriers to investment and industrial activities in the sphere of industrial production, other sectors of economy. The changes introduced in the legislation create incentives to the modernization of national economy and at the same time reliable control of technological and economic risks associated with industrial activity.

Criteria for the identification of hazardous industrial facilities were specified. The classification of hazardous industrial facilities was introduced considering the degree of accident risk and extent of accident effects, which was harmonized with the legislation of the European Union. According to the classification all hazardous industrial facilities are divided in four hazard classes:

- class I — extremely high-hazard facilities;
- class II — high-hazard facilities;
- class III — medium-hazard facilities;
- class IV — low-hazard facilities.

The regime of continuous state supervision was established in respect of class I hazardous industrial facilities. Scheduled inspections of the organizations operating class I and II hazardous industrial facilities are conducted no more than once a year, class III - no more than once in three years. Scheduled inspections of class IV hazardous industrial facilities are not conducted.

Organizations operating hazardous industrial facilities made an obligation to create systems of industrial safety management.

The scope of obligatory industrial safety declaration was limited to class I and II hazardous industrial facilities.

The obligation to develop action plans for accident localization and effects removal at class IV hazardous industrial facilities was excluded.

Notification procedure was introduced for the beginning of activity on operation of class IV hazardous industrial facilities.

Apart from that, the changes that were introduced allowed to combine two licensable kinds of activities (operation of explosion/fire hazardous and chemically hazardous production facilities), and reduce licensees' expenses for obtaining two licenses, as a consequence.

The function of the federal executive authority in the field of industrial safety to issue permits for the use of technical devices at hazardous industrial facilities was excluded.

For the purpose of removing excessive technical barriers to investment activity at hazardous industrial facilities, a legal regime was introduced for their

operation, preservation and liquidation basing on individual requirements set out in design documentation. Safety analysis of such facilities is made according to the criteria established by federal regulations in the sphere of industrial safety.

Legal basis was elaborated for industrial safety assurance on the continental shelf of the Russian Federation.

With account of the above mentioned changes other regulatory legal acts were brought in line with the requirements of the Federal Law "On industrial safety of hazardous industrial facilities": changes were introduced in part 2 of the Tax Code of the Russian Federation, Town-Planning Code of the Russian Federation, Federal laws of 30 November 1995 No.187-FZ "On continental shelf of the Russian Federation", of 21 July 1997 No.117-FZ "On safety of hydraulic engineering structures", of 26 January 2008 No.294-FZ "On protection of the rights of legal entities and individual entrepreneurs in the exercise of state control (supervision) and municipal control", of 27 July 2010 No.225-FZ "On compulsory civil liability insurance of owners of hazardous facilities for infliction of harm as a result of accident at a hazardous facility", of 4 May 2011 No.99-FZ "On licensing of specific types of activities". Stage wise enactment of individual provisions of the law is envisaged (considering the changes made in the law), with account for the required re-registration of the operating hazardous industrial facilities in the state register, and also for scheduled preparation dates of the regulatory acts of the Government of the Russian Federation and federal executive authorities.

2. Federal Law of 2 July 2013 No.186-FZ "On introduction of changes in certain legal acts of the Russian Federation where concerns industrial safety review and specifying of certain powers of state supervisory bodies in administrative offense proceedings".

With the aim of monitoring the status of industrial safety and wearing of equipment, and also for accounting of the activity of expert review organizations and making them answerable in the event of undue performance of expert review activities, the above mentioned Federal Law obligated Rostekhnadzor to maintain accounting and keep register of industrial safety reviews without assessment of their contents.

In order to establish legal status of industrial safety expert by law, articles 1 and 13 of the Federal Law were changed to define the powers and obligations of such persons.

Also the introduction of the term "industrial safety expert" was envisaged, and establishment of special responsibility for administrative offense (Administrative Offense Code of the Russian Federation article 9.1, new part 1.1) and for criminal offense (new article 217<sup>2</sup> of the Criminal Code of the Russian Federation) in the event that industrial safety expert makes knowingly false conclusions. Amendments were made to the Administrative Offense Code of the Russian Federation aimed at the optimization of Rostekhnadzor activities in the framework of exercising its controlling/supervisory powers and elimination of legal collisions between different provisions of the above mentioned Code (amendments to articles 23.30 и 23.31).

It was envisaged that administrative action should be brought against industrial safety experts as official persons (amendment to article 2.4), which is due to the high public danger associated with the activity of such persons and ineffectiveness of administrative action against them in their capacity as common persons.

Also, amendments to article 4.5 part 1 are aimed at the extension of limitation period for the institution of administrative proceedings for administrative offenses in the field of safety of hydraulic engineering structures, town-planning activities from 2 months to one year.

Changes were also introduced in the Arbitration Procedure Code of the Russian Federation aimed at the elaboration of the appeal procedure against judgments in administrative offense cases, where administrative suspension of activity or confiscation of the instrument or object of administrative offense are invoked as punishment, where concerns appealability of such judgments in case the first instance court violates the norms of substantive law.

3. Decree of the Government of the Russian Federation No. 486 of 10 June 2013 "On introduction of changes in the Regulations for registration of facilities in the state register of hazardous industrial facilities approved by the Decree of the Government of the Russian Federation of 24 November 1998 No.1371".

4. Decree of the Government of the Russian Federation No. 492 of 10 June 2013 "On the licensing of operation of explosive, fire and chemically hazardous industrial facilities of hazard class I, II and III".

5. Decree of the Government of the Russian Federation No. 536 of 26 June 2013; "On the approval of requirements for documentation support of industrial safety management systems".

6. Decree of the Government of the Russian Federation No. 526 of 21 June 2013 "On introduction of changes and invalidation of certain acts of the Government of the Russian Federation".

7. Decree of the Government of the Russian Federation of 12 August 2013 No.690 "On introduction of changes in the Regulations for notifications on the beginning of certain types of entrepreneurial activities and accounting of the notifications".

8. Decree of the Government of the Russian Federation of 26 January 2013 No. 1283 of 30.07.2004 "On introduction of changes in the Provisions on the Federal Environmental, Industrial and Nuclear Supervision Service".

9. Decree of the Government of the Russian Federation of 26 August 2013 No.730 "On action plans for accident localization and effects removal at hazardous industrial facilities".

21 regulatory legal acts in the field of industrial safety were approved by Rostekhnadzor orders in 2013.

#### *Regulatory legal control in the sphere of state construction supervision*

Relations in the sphere of state construction supervision are regulated by the Town-Planning Code of the Russian Federation, Provisions on the implementation of state construction supervision in the Russian Federation approved by the Decree of the Government of the Russian Federation of 1 February 2006 No.54.



In 2013 Rostekhnadzor prepared and approved by its order of 31 January 2013 No.38 Administrative regulations for execution by the Federal Environmental, Industrial and Nuclear Supervision Service of the state function of federal state construction supervision of construction and reconstruction of capital construction facilities indicated in article 6 item 5.1 of the Town-Planning Code of the Russian Federation, except for the facilities that should be supervised by other federal executive authorities in accordance with the decrees of the President of the Russian Federation.

*Participation in the development of the Technical Regulations of Customs Union  
"On safety of equipment operating under excessive pressure", development and  
implementation of action plans*

The Federal Environmental, Industrial and Nuclear Supervision Service of Russia being responsible party of the Russian Federation, upon completion of internal national agreement procedures, in 2013 took part in the work of the working group on legal and technical editing of the text of provisions of the Technical Regulations of Customs Union "On safety of equipment operating under excessive pressure".

The Technical Regulations of Customs Union "On safety of equipment operating under excessive pressure" were adopted by decision of the Board of the Eurasian Economic Commission of 2 July 2013 No.41.

The Federal Environmental, Industrial and Nuclear Supervision Service of Russia developed an action plan aimed at the implementation of the Technical Regulations of Customs Union "On safety of equipment operating under excessive pressure" in the Russian Federation.

The plan was approved by the subcommission on technical regulation, sanitary, veterinary - sanitary and phytosanitary measures of the Government commission of economic development and integration.

In fulfillment of the action plan, for the purpose of defining an authorized body of the Russian Federation for state control (supervision) over implementation of the requirements of Technical Regulations of Customs Union TP TC 032/2013 "On safety of equipment operating under excessive pressure", Rostekhnadzor developed draft Decree of the Government of the Russian Federation of 13 May 2013 No.407 "On authorized bodies of the Russian Federation for state control (supervision) over implementation of the requirements of Technical Regulations of the Customs Union". At the present time the draft Decree is in the process of interdepartmental agreement.

Apart from that, in fulfillment of the action plan, Rostekhnadzor presented proposals for standardization documents updates, which, if used on a voluntary basis, assure that requirements of Technical Regulations of the Customs Union, and also standards containing the rules and methods of investigation (tests) and measurements would be satisfied. Workshops and consultations were made to explain the provisions of the Technical Regulations of Customs Union "On safety of equipment operating under excessive pressure".

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In order to develop a common approach to the implementation of requirements of the Technical Regulations of Customs Union "Safety of lifts" adopted by decision of the Board of the Eurasian Economic Commission of 18 October 2011 No.824, Rostekhnadzor developed Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service to perform its state function of exercising state control (supervision) of the implementation of requirements of the Technical Regulations of Customs Union "Safety of lifts" approved by the order of 19 December 2013 No.631.

In the framework of implementation of the plan of rule-making activity of Rostekhnadzor for 2013 draft federal law "On the introduction of changes in the Federal Law "On electric power industry" was submitted to the Government of Russian Federation.

In 2013 five decrees of the Government of the Russian Federation were prepared and published:

Decree of the Government of the Russian Federation No. 492 of 10 June 2013 "On the licensing of operation of explosive, fire and chemically hazardous industrial facilities of hazard class I, II and III";

Decree of the Government of the Russian Federation No. 526 of 21 June 2013 "On introduction of changes and invalidation of certain acts of the Government of the Russian Federation";

Decree of the Government of the Russian Federation No. 536 of 26 June 2013 "On the approval of requirements for documentation support of industrial safety management systems";

Decree of the Government of the Russian Federation No. 730 of 26 August 2013 "On action plans for accident localization and effects removal at hazardous industrial facilities";

Decree of the Government of the Russian Federation No. 986 of 2 November 2013 «On classification of hydraulic engineering structures».

In 2013 draft Decrees of the Government of the Russian Federation "On introduction of changes in the Decree of the Government of the Russian Federation of 28 October 2009 No.846 "On approval of the Regulations on investigation of accidents in electric power industry" and "On commissioning procedure and accounting of lifts".

*Participation in the work of the Board on cooperation in the field of peaceful use of atomic energy with the EurAsEC Integration Committee to prepare the Agreement on pursuing agreed policy of regulatory legal and regulatory technical control for peaceful atomic energy use of EurAsEC states*

In December 2013 Rostekhnadzor received for consideration draft EurAsEC agreement on pursuing agreed policy in the field of peaceful use of atomic energy with regard to regulatory legal and regulatory technical control, compliance assessment, standardization, accreditation and metrological support.

Draft Agreement was prepared with account for the provisions of Convention on Nuclear Safety (1994), Convention on the Early Notification of a Nuclear Accident (1986), Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency (1986), Convention on the Physical Protection of Nuclear Material (1980), Convention on the Prevention of Marine Pollution by Dumping of Wastes

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and other Matter, as amended (1994), and other associated international legal documents, and also with account for the provisions contained in the international general safety requirements, such as "Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards Interim edition" (2011), in the IAEA document «Radioactive waste management objectives» (NW-O, Vienna, IAEA, 2011), and in the existing international norms related to safe transportation of radioactive material. The object of draft Agreement is to establish specific technical regulations to the extent of development and establishment of obligatory requirements, accreditation, metrological support, standardization and compliance assessment of the products, including those imported to EurAsEC countries, which are covered by the requirements connected with safety assurance in the field of atomic energy use, and also the processes of designing (engineering), production (manufacturing), installation, adjustment, operation, storage, transportation, distribution, disposal, burial.

In the framework of *implementation of the plan of rule-making activity of Rostekhnadzor for 2013* Rostekhnadzor issued 21 orders:

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for hazardous industrial facilities where lifting devices are used" of 12 November 2013 No.533 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No.30992);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for coal mines" of 19 November 2013 No.550 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No.30961);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for main pipelines" of 6 November 2013 No.520 (registered by the Ministry of Justice of Russia on 16 December 2013, registration No.30605); On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for gas distribution and gas consumption networks" of 15 November 2013 No.542 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No. 30929);

On approval of the Federal codes and regulations in the field of industrial safety "General requirements for safety analysis of hazardous industrial facility" of 15 July 2013 No.306 (registered by the Ministry of Justice of Russia on 20 August 2013, registration No. 29581);

On approval of the Federal codes and regulations in the field of industrial safety "Regulations for conducting industrial safety review" of 14 November 2013 No.538 (registered by the Ministry of Justice of Russia on 26 December 2013, registration No. 30855);

On approval of the Federal codes and regulations in the field of industrial safety "Industrial safety requirements for conducting blasting operations" of 16 December 2013 No.605 (submitted to the Ministry of Justice of Russia for state registration with letter of 16 December 2013 No.00-02-04/2499);

On approval of the Federal codes and regulations in the field of industrial safety "Industrial safety regulations for conducting mining operations and processing of solid mineral deposits" of 11 December 2013 No.599 (the order was submitted to the Ministry of Justice of Russia for state registration with letter of 12 December 2013 No.00-04-04/2186);

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On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for underground gas storage facilities" of 22 November 2013 No.561 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No.30994); On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for the facilities that use liquefied hydrocarbon gases" of 21 November 2013 No.558 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No.30993);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for chemically hazardous industrial facilities" of 21 November 2013 No.559 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No.30995);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for chlorine and chlorine-containing media production facilities" of 20 November 2013 No.554 (registered by the Ministry of Justice of Russia on 31 December 2013, registration No. 30968);

On approval of the Federal codes and regulations in the field of industrial safety "Industrial safety requirements for receiving, transportation, using of ferrous and non-ferrous metal melts and melts-based alloys" of 30 January 2013 No.656 (submitted to the Ministry of Justice of Russia for state registration with letter of 9 January 2014 No.00-04-04/15/1);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for explosion and fire hazardous industrial facilities for storage and processing of herbal raw material" of 21 November 2013 No.560 (registered by the Ministry of Justice of Russia on 16 December 2013, registration No.30606);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for operation of escalators in metro" of 13 January 2014 No.9 (submitted to the Ministry of Justice of Russia for state registration with letter of 16 January 2014 No.00-01-26/45);

On the approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for operation of passenger cable-railway and funicular" of 6 February 2014 No.42 (the order was submitted to the Ministry of Justice of Russia for state registration with letter of 10 February 2014 No.00-02-04/213);

On approval of the Federal codes and regulations in the field of industrial safety "Safety regulations for operation of cargo cable-railway" of 22 November 2013 No.563 (registered by the Ministry of Justice of Russia on 17 January 2014, registration No. 31036);

"On the approval of a form for the pre-declaration hydraulic engineering structures survey report (except for navigation hydraulic structures)" of 30 October 2013 No.506 (submitted to the Ministry of Justice of Russia for state registration with letter of 10 January 2014 No. 00-03-04/16);

On the approval of the form and procedure for maintaining the register of the organizations that perform the activities related to the operation of radiation sources that contain only radionuclide sources of radiation hazard category 4 and 5 of 29 October 2013 No.504 (registered by the Ministry of Justice of Russia on 25 December 2013, registration No.30827);

On the approval of the form for notification of the activities related to the operation of radiation sources that contain only radionuclide sources of radiation

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hazard category 4 and 5 of 29 October 2013 No.505 (registered by the Ministry of Justice of Russia on 19 December 2013, registration No.30667);

On the approval of the regulations for technical diagnostics of gas equipment located in houses and apartments of 17 December 2013 No.613 (submitted to the Ministry of Justice of Russia for state registration with letter of 25 December 2013 No.00-06-04/1178).

Draft orders were developed on the approval of federal regulations in the sphere of industrial safety "Safety regulations for hazardous industrial facilities using the equipment operating under excessive pressure" and "Safety regulations for offshore oil and gas facilities".

Totally 54 regulatory legal acts were developed, approved by Rostekhnadzor and registered by the Ministry of Justice of Russia in 2013.

*Anti-corruption review of regulatory legal acts and draft regulatory legal acts.*

The work of studying regulatory legal acts of Rostekhnadzor for the purpose of identifying corruptogenic factors in the above mentioned acts and their subsequent elimination is carried out according to Rostekhnadzor order dated 12th March 2010 No. 152 "On the organization of anti-corruption review of regulatory legal acts and draft regulatory legal acts issued by the Federal Environmental, Industrial and Nuclear Supervision Service".

Thus, anti-corruption review of draft regulatory legal acts prepared by structural units of Rostekhnadzor was carried out by the Legal Department as part of legal review of the draft documents. Anti-corruption review was conducted in accordance with the Procedure for conducting anti-corruption review of regulatory legal acts and draft regulatory legal acts approved by Decree of the Government of the Russian Federation of 26 February 2010 No.96.

Draft regulatory legal act provisions which are conducive to corruption, if found by anti-corruption review conducted by the Legal Department, were eliminated at the stage of reworking the draft regulatory legal act by the structural unit of Rostekhnadzor that developed the draft regulatory legal act.

In the first half of 2013 anti-corruption review was carried out in respect of 41 draft regulatory legal acts of the Federal Environmental, Industrial and Nuclear Supervision Service. In draft regulatory legal acts 12 corruptogenic factors were identified and completely eliminated in further work on the said drafts.

According to the Procedure for conducting anti-corruption review of regulatory legal acts and draft regulatory legal acts issued by the Federal Environmental, Industrial and Nuclear Supervision Service, which was approved by the above mentioned order of Rostekhnadzor, structural units check the previously adopted regulatory legal acts when monitoring the way they are used for the purpose of identifying corruptogenic factors in the said acts.

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In the first half of 2013 the above mentioned work in the divisions of the Federal Environmental, Industrial and Nuclear Supervision Service was carried out simultaneously with the revision of previously issued regulatory legal acts in order to make these acts consistent with the legislation of the Russian Federation.

The process of revision of previously issued regulatory legal acts also included anti-corruption review of five regulatory legal acts of Gosgortekhnadzor of Russia, which were amended and were judged not applicable.

No corruptogenic factors were identified in the acts of Gosgortekhnadzor of Russia.

In the second half of 2013 anti-corruption review was carried out in respect of 74 draft regulatory legal acts of the Federal Environmental, Industrial and Nuclear Supervision Service. In draft regulatory legal acts 23 corruptogenic factors were identified and completely eliminated in further work on the said drafts.

According to the Procedure for conducting anti-corruption review of regulatory legal acts and draft regulatory legal acts issued by the Federal Environmental, Industrial and Nuclear Supervision Service, which was approved by the above mentioned order of Rostekhnadzor, structural units check the previously adopted regulatory legal acts when monitoring the way they are used for the purpose of identifying corruptogenic factors in the said acts.

In the second half of 2013 the above mentioned work in the divisions of the Federal Environmental, Industrial and Nuclear Supervision Service was carried out simultaneously with the revision of previously issued regulatory legal acts in order to make these acts consistent with the legislation of the Russian Federation.

The process of revision of previously issued regulatory legal acts also included anti-corruption review of one act of the Federal Environmental, Industrial and Nuclear Supervision Service, five acts of the Federal Nuclear and Radiation Safety Authority of Russia, five acts of the Federal Mining and Industrial Supervision Authority of Russia and one joint act of Gosgortekhnadzor of Russia and Gosatomnadzor of Russia.

No corruptogenic factors were identified in the above mentioned regulatory legal acts.

*Status of contractual work in the Federal Environmental, Industrial and  
Nuclear Supervision Service of Russia*

During 2013 specialists of the Legal Department in the framework of contractual work made legal review of 155 draft agreements and state contracts for works and services, supplying of goods, research and development works and other kinds of civil law contracts.

*Claims-related work in the sphere of activity of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia Claims-related work*

***Court proceedings with the participation of Rostekhnadzor Headquarters.***

Totally in 2013 Rostekhnadzor Legal Department took part in 83 court proceedings; out of this amount:

73 cases were tried (cases over invalidation of Rostekhnadzor actions to introduce data in the register of self-regulated organizations, over invalidation of Rostekhnadzor regulatory legal acts, over invalidation of prescriptions, decisions and actions (inactions) of Rostekhnadzor, recovery of losses, etc.);

10 cases are currently pending court proceedings (appellate court case over recourse against the first instance court decision against exclusion from the state register of self-regulated organizations of builders' non-profit organization "Stroy-Region", cassation court case over recovery from Rostekhnadzor of court fees on the application from individual entrepreneur G.G.Ostapenko, proceedings in which Rostekhnadzor was brought as non-party, etc.).

Of the 73 cases that were heard in court, the court ruled in favor of Rostekhnadzor in 37 cases, including

24 cases over invalidation of orders, decisions, letters, notifications, actions (inactions) of Rostekhnadzor;

8 cases over recourse against court decisions on the refusal on the part of Rostekhnadzor from accepting for consideration of complaints against orders of Rostekhnadzor territorial bodies;

2 cases over recovery of damages and unjustified enrichment;

3 cases over other matters (over protection of business reputation, termination of license, etc.).

In 30 cases Rostekhnadzor was brought into the proceedings as a non-party intervener, and the court took into account Rostekhnadzor's position.

In 3 cases the court ruled not in favor of Rostekhnadzor.

In 3 cases the court made a decision on partial satisfaction of the claim against Rostekhnadzor.

Out of 37 cases where the court ruled in favor of Rostekhnadzor, in 4 cases the court made a decision to refuse from collection of cash from Rostekhnadzor (compensations, lost profit, court fees, losses) totaling 10,171,524.49 rubles.

***Court proceedings with the participation of Rostekhnadzor territorial bodies.***

Totally in 2013 the specialists of Rostekhnadzor territorial bodies took part in 9933 court proceedings.

Arbitration courts considered 3,888 cases:

In 1,725 cases the court supported the position of Rostekhnadzor;

in 1,051 cases the court refused to satisfy Rostekhnadzor claims.

Courts of general jurisdiction considered 6,045 cases.

In 4,753 cases the court supported the position of Rostekhnadzor;

In 638 cases decisions were made not in favor of Rostekhnadzor territorial bodies;

1,766 cases are under court proceedings.



Analysis of the data on the representation in court of the interests of Rostekhnadzor territorial bodies showed that in 2013 with the participation of Rostekhnadzor territorial bodies the courts considered 8,081 cases over imposition of administrative sanctions, 1,209 appeals against prescriptions and other non-regulatory legal acts, actions (inactions) of Rostekhnadzor territorial bodies; 601 civil cases (over termination of agreements, declaration of property rights, recognition of legally significant facts, etc.), 42 cases over redemption, compensation of damages, losses, penalty.

*Activity related to revision of court rulings and decisions on cases concerning administrative offenses*

Rostekhnadzor headquarters considered 71 complaints against the decisions on administrative offenses made by officers of Rostekhnadzor territorial bodies. Of this number 6 complaints were filed by officers of supervised organizations and 65 complaints by legal persons. The following decisions were made upon consideration of complaints against administrative offense court decisions:

- in 1 case the court decision was changed from part 2 clause 9.4 to part 1 clause 9.4 of Administrative Offense Code of the Russian Federation;

- in respect of 5 complaints court proceedings were terminated due to simultaneous complaint filing to a territorial department, delay in filing the complaint;

- in 11 cases the complaints were dismissed since they were filed by an unauthorized person;

- in respect of 18 complaints a decision was made to cancel the decisions issued on administrative offense cases; in respect of 8 complaints the documents were returned for reconsideration to Rostekhnadzor territorial bodies; in respect of 10 complaints court proceedings in administrative offense cases were terminated;

- in respect of 36 complaints decisions on administrative offense cases were left unchanged, and complaints were not satisfied.

It was established by analysis that 29 complaints were filed against the decisions on administrative offense cases that were made under part 1 clause 9.4 of the Administrative Offense Code of the Russian Federation, and also appeals were made against the administrative offense decisions made under clause 9.5, clause 19.5 part 11 of the Administrative Offense Code of the Russian Federation. Most of these complaints were related to the decisions on administrative offense cases that were made by officials of the Interregional Industrial Department of Rostekhnadzor.

## 2.2. Control and Supervision, Licensing and Permitting Activity

### 2.2.1 Nuclear power plants

In 2013, the Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostekhnadzor) exercised control of nuclear and radiation safety of 17 nuclear power plants (the Balakovo NPP, the Baltic NPP, the Beloyarsk NPP, the Bilibino NPP, the Kalinin NPP, the Kola NPP, the Kursk NPP, the Leningrad NPP, the Leningrad NPP-2, the Nizhny Novgorod NPP, the Novovoronezh NPP, the Novovoronezh NPP-2, the Rostov NPP, the Seversk NPP, the Smolensk NPP, the Tver NPP, the Central NPP), in which 33 power Units were in operation, 2 Units were at the stage of preparation for decommissioning (Units 1 and 2 of the Beloyarsk NPP), two Units were at the stage of decommissioning (Units 1 and 2 of the Novovoronezh NPP), 10 Units were at the stage of construction (Units 1 and 2 of the Leningrad NPP-2, Units 1 and 2 of the Novovoronezh NPP-2, Units 3 and 4 of the Rostov NPP, Unit 4 of the Beloyarsk NPP, Unit 5 of the Kursk NPP, Unit 5 of the Balakovo NPP, Unit 1 of the Baltic NPP), siting activity is going on for 11 power Units (Units 1 and 2 of the Seversk NPP, Units 3 and 4 of the Leningrad NPP-2, Unit 2 of the Baltic NPP, Units 1 and 2 of the Central NPP, Units 1 and 2 of the Nizhny Novgorod NPP, Units 1 and 2 of the Tver NPP).

Distribution of the NPP reactors by their types is presented in Table 1.

**Table 1**

**Distribution of the NPP reactors by their types**

<b>In operation</b>	
Pressurized water reactors	WWER-1000 - 11 Units, WWER-440 - 6 Units.
Water cooled pressure tube reactors	RBMK-1000 - 11 Units, EGP-6 - 4 Units.
Fast reactors	BN-600 - 1 Unit
<b>Shut down for preparation for decommissioning</b>	
Water cooled pressure tube reactors	AMB-100 - 1 Unit, AMB-200 - 1 Unit
<b>At the stage of decommissioning</b>	
Pressurized water reactors	WWER-210 - 1 Unit, WWER-365 - 1 Unit.
<b>At the stage of construction</b>	
Pressurized water reactors	WWER-1200 - 5 Units, WWER-1000 - 3 Units.
Fast reactors	BN-800 - 1 Unit.
Water cooled pressure tube reactors	RBMK-1000 - 1 Unit.
<b>Siting activity is going on</b>	
Pressurized water reactors	WWER-1200 - 11 Units.

In 2013, supervision was exercised over observance of codes and standards, license validity provisions in 1,787 (in 2012 - in 1,774) organizations engaged in designing systems and facilities, designing and manufacturing the equipment for nuclear power plants and research nuclear installations, reviewing the safety of nuclear facilities and/or activities in the field of atomic energy use, including:

558 (in 2012 — 568) in the design organizations;

1,122 (in 2012 — 1,118) at the manufacturing plants;

72 (in 2012 — 56) in the engineering design organizations holding licenses for designing nuclear power plants;

35 (in 2012 — 32) in expert organizations.



### Licensing activity

The number of currently valid Rostekhnadzor operation licenses for nuclear power plant Units and other nuclear facilities at nuclear power plant sites is 44.

In 2013 Rostekhnadzor headquarters issued 37 (in 2012 - 20) licenses to the operating organization JSC Rosenergoatom Concern and to the organizations engaged in designing and engineering of the equipment for nuclear power plant power generating Units, safety reviews, etc. In addition, 174 (in 2012 - 206) modifications of license validity provisions were executed and 13 (in 2012 - 17) refusals to grant a license were issued on the grounds of the reviews that contained the conclusions of failure to assure the safety of a nuclear facility and/or the licensed type of activity, and/or due to the fact that the documents submitted by the applicant did not comply with the legislation of the Russian Federation, the requirements of federal nuclear power codes and standards.

The data on the number of licenses issued for specific types of activities are presented in Table 2.

**Table 2**

#### The data on the number of licenses issued in 2013 for specific types of activities

Type of activity	Number of licenses
Siting of NPP Units	1 (0)
Operation of solid radwaste storage facilities	1 (0)
Operation of NPP power Units	2 (3)
Management of radioactive substances	0 (1)
NPP Unit decommissioning	2 (0)
Design and engineering of NPP power Units, radiation sources, nuclear materials and radioactive substances storage facilities, radioactive waste depositories	13 (7)
Equipment design for NPPs	4 (1)
Equipment manufacturing for NPPs	2 (3)
Use of nuclear materials in the research activity	2 (0)
Implementation of the expert review	10 (5)
<b>Total:</b>	<b>37 (20)</b>

*Note.* Hereinafter, the data for 2012 are given in parentheses.

The information on the number of licenses issued by the interregional territorial departments for nuclear and radiation safety supervision (NRS ITD) to the organizations engaged in works and rendering services to nuclear power plants is presented in Table 3.

**Table 3**

#### The information on the number of licenses issued in 2013 by the interregional territorial departments for nuclear and radiation safety supervision (NRS ITD) to the organizations engaged in works and rendering services to nuclear power plants

Indicator/NRS ITO	VITD	DITD	NEITD	UITD	CITD	NDITD	Total
Number of licenses issued for works and rendering services to the nuclear power plants	85 (74)	48 (56)	161 (157)	77 (89)	403 (268)	27(4)	801 (648)

In 2013, Rostekhnadzor headquarters and ITDs issued the licenses: to the design organizations — 164 (125), to the manufacturer plants — 210 (188). Licenses were not issued to 8 (10) enterprises on the grounds of presentation of inadequate information and

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insufficient substantiation of the declared activity. In 2013, no cases of unauthorized activity associated with the manufacturing of nuclear power plant equipment by the enterprises and organizations not licensed by Rostekhnadzor were registered.

In accordance with the "Administrative Regulations for Rendering by Federal Environmental, Industrial and Nuclear Supervision Service of Russia of the State Service of Issuing Permits for Activities in the Field of Atomic Energy Use to the Employees of Nuclear Facilities," Rostekhnadzor was issuing permits for activities in the field of use of atomic energy to the employees (personnel) of nuclear power plants.

In the reporting period Rostekhnadzor headquarters issued permits to 22 (33) executives of the nuclear power plants. The Interregional Territorial Office for Nuclear and Radiation Safety (ITD NRS) issued permits to 446 (394) employees (operating personnel) of nuclear power plants.

### **Inspection activity**

In 2013, Rostekhnadzor headquarters arranged and conducted with the participation of ITD NRS 3 (3) checks of nuclear power plants: the Kursk NPP, the Rostov NPP, and the operating organization JSC Rosenergoatom Concern, and a dedicated inspection of the Beloyarsk NPP Unit 4 prior to its first criticality.

As a result of the inspections 71 (26) violations of the requirements of federal codes and standards in the field of atomic energy use were revealed and 3 (3) orders for elimination thereof were issued. ITD NRS inspectors imposed administrative fines on the officials of the nuclear power plants amounting to the total sum of 120 (241) thousand rubles; Rostekhnadzor headquarters official imposed a fine on the legal entity - JSC Rosenergoatom Concern for the sum of 300 thousand rubles.

The increase in the number of revealed violations was caused by conducting in 2013 of a comprehensive inspection of the operating organization JSC Rosenergoatom Concern (in 2012 such an inspection was not conducted, only nuclear power plants were checked) as a result of which 50 violations and 59 deficiencies were revealed. Violations were revealed in all aspects of the operating organization activity.

The main kinds of revealed violations and deficiencies consisted in the absence of the necessary procedures and techniques (for instance, the procedure for forming and maintaining safety culture, procedure for the audits of implementation of quality assurance programs of the organizations conducting works and rendering services to the operating organizations, etc.), non-compliance of departmental documents, job descriptions, provisions on structural divisions of the operating organization with the established requirements, availability of equipment that was not registered in accordance with the established procedure, ineffective control of the activity associated with maintenance of radioactive waste (RW) management system, aimed at timely reprocessing of RW, violations of incoming inspection of activities during construction of NPP Units, etc.

In the framework of supervision over design and engineering organizations and manufacturing plants, monitoring was exercised to check the observance of codes and standards while executing the activities related to improvement of quality and reliability of equipment and pipelines of a long-term manufacturing cycle for NPP-2006 projects.

In 2013, ITD NRS conducted 3,123 (3,012) inspections of nuclear power plants and organizations rendering services (conducting works) for the operating organization, 388 (471) violations of federal codes and standards in the field of atomic energy use and of

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license validity conditions were revealed, as a result of the inspections on 83 (76) occasions enforcement actions were taken, administrative fines for the total sum of 2,428 (1,967) thousand rubles were imposed.

The manning level of inspection divisions with ITD NRS employees is, on the whole, 75 %. At the same time, the manning level of North European ITD NRS is less than 50 %, the manning level of inspection divisions at the Kursk, Leningrad, Smolensk, and Bilibino NPPs is 50-60 %.

Following the analysis of ITD NRS reports, in spite of the shortage of inspectors, the activity of ITD NRS may be on the whole considered to be satisfactory, and a certain increase of supervisory and licensing activity indicators may be noted. The number of inspections, applied enforcement actions, the sums of imposed fines, the number of issued licenses and permits increased.

The arrangement, conduct of inspections and documenting of their results, as well as implementation of measures within the framework of continuous state supervision meet the established requirements. The indicators of ITD NRS activity are presented in Table 4.

*Table 4*

**The indicators of ITD NRS activity in 2013**

Indicator/ITD NRS	VITD	DITD	NEITD	UITD	CITD	S&FEITD	Total
Total number of checks (inspections)	531 (770)	988 (940)	1306 (877)	60 (83)	230 (324)	8 (10)	3,123 (3,004)
Violations of law revealed	58 (160)	157 (186)	43 (28)	1 (1)	129 (96)	0	388 (471)
The total sum of administrative fines imposed, thousand rubles	270 (352)	975 (1,323)	415 (172)	698 (120)	70 (0)	0	2,428 (1,967)

In 2013, 755 (634) inspections were conducted in the organizations (enterprises) engaged in equipment design and manufacturing and conducting reviews. The inspections revealed 209 (436) violations of the requirements of the codes and standards, and validity conditions of licenses for equipment design and manufacture. The primary causes of violations consist in insufficient knowledge of the requirements of federal codes and standards, and of license validity conditions by the personnel. On four occasions of the revealed violations, proceedings were initiated on cases concerning administrative offenses. Based on the results of 7 checks, administrative penalties were imposed in the form of fines to the total amount of 435 thousand rubles.

#### **General assessment of safety of nuclear power plant Units. The condition of nuclear power plant Units. Problems arising in the course of operation of the nuclear power plant Units**

Based on the results of conducted inspections and measures taken within the framework of continuous state supervision, analysis of ITD NRS reporting information and annual reports of the operating organization on the current safety status of nuclear power plants, it may be concluded that in spite of the violations revealed, the state of nuclear, radiation and technical safety of nuclear power plant Units is on the whole assessed as satisfactory, license validity conditions and the requirements of the federal codes and standards in the field of nuclear power use are basically fulfilled, revealed violations are eliminated by the times set in Rostechnadzor orders.

The problems arising in the course of operation of the nuclear power plant Units are

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solved in accordance with the established procedure. For instance, in the Leningrad NPP Unit 1 equipped with the first generation RBMK-1000 reactor, a problem arose, which was associated with cracking of graphite blocks, that caused changes in graphite stack geometry, and change in the curvature of fuel channels (FC) and of reactor emergency protection and control rod channels, which exceeded the values set in the regulations. In this connection, Leningrad NPP Unit 1 was shut down for taking measures to compensate degradation of the graphite stack properties.

JSC Rosenergoatom Concern developed the technology for restoration of the graphite stack resource features (RGSRF) of the reactor. The package of documents substantiating Unit 1 safety was submitted to Rostekhnadzor. The review of the safety case, arranged by Rostekhnadzor and conducted by scientific and technical support organization, established the compliance of submitted documents with the requirements of federal codes and standards in the field of atomic energy use, state of the art science and technology development level.

Following the works performed, the sags of graphite columns and, correspondingly, of fuel channels and protection and control rod channels were brought to the values set in the regulations, which confirmed the effectiveness of the chosen technology for restoration of the graphite stack resource features.

Based on the results of performed RGSRF, JSC Rosenergoatom Concern prepared the documents substantiating safe power operation of Leningrad NPP Unit 1.

Based on the results of safety case review conducted by the scientific and technical support organization, it was determined that power operation of Leningrad NPP Unit 1 after RGSRF is substantiated and meets the requirements of federal codes and standards in the field of atomic energy use. Based on positive results of the review and obtained neutronic characteristics, Rostekhnadzor made amendments in the license validity conditions, authorizing power operation of Unit 1.

At the present time, Leningrad NPP Unit 1 reached 100 % power, as safety precautions and measures to monitor the condition of the core components are taken. Information on the reactor installation parameters submitted by JSC Rosenergoatom Concern indicated that they complied with the requirements of the regulatory documents, Operational regulations, In-Depth Safety Assessment Report, and the Reactor Plant Certificate.

Using similar technology, RGSRF was accomplished at Kursk NPP Unit 2. Following the works performed, the sags of graphite columns and, correspondingly, of fuel channels and protection and control rod channels were brought to the values set in the regulations. Based on the results of performed RGSRF, JSC Rosenergoatom Concern prepared and submitted the documents substantiating safe power operation of Kursk NPP Unit 2, which are now undergoing safety review.

Similar problems at other power Units of NPPs equipped with the first generation RBMK-1000 reactors will be solved as they arise using the proven technology.

JSC Rosenergoatom Concern continues its work on actualization and taking measures to prevent beyond design basis accidents at nuclear power plant Units and to mitigate their consequences. The mentioned measures were developed by JSC Rosenergoatom Concern following the analysis of stress tests conducted at Russian NPPs in connection with the accident at Fukushima NPP and are agreed upon by Rostekhnadzor.

Rostekhnadzor exercises control of implementation of the mentioned measures and continues the analysis of current regulatory documents from the point of view of availability of requirements for nuclear facility safety assurance in the event of extreme natural phenomena.

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## **Construction of nuclear power plants**

In 2013, in accordance with federal dedicated program "Development of nuclear power engineering and industrial complex of Russia for 2007-2010 and until 2025" and the plan for implementation of the "Energy Strategy of Russia up to 2030," 10 power Units were under construction (Leningrad NPP-2 Units 1 and 2; Baltic NPP Unit 1; Novovoronezh NPP-2 Units 1 and 2; Rostov NPP Units 3 and 4; Beloyarsk NPP Unit 4; Kursk NPP Unit 5; Balakovo NPP Unit 5). Construction licenses were issued for Kursk NPP Unit 5 and Balakovo NPP Unit 5, but actually the works are not conducted.

In 2013, state construction supervision was conducted at the NPP power Units under construction by combined work teams under the direction of deputy managers of ITD NRS in accordance with the requirements of the Town-planning Code of the Russian Federation, Provision on the Implementation of State Construction Supervision in the Russian Federation approved by the Regulation of the Government of the Russian Federation No.54 of February 1, 2006 and Rostekhnadzor order No.569 of September 29, 2011, "On the Organizational Measures to Increase the Effectiveness of the State Construction Supervision by the Federal Environmental, Industrial and Nuclear Supervision Service during Construction and Renovation of Buildings and Engineering Structures of Nuclear Facilities."

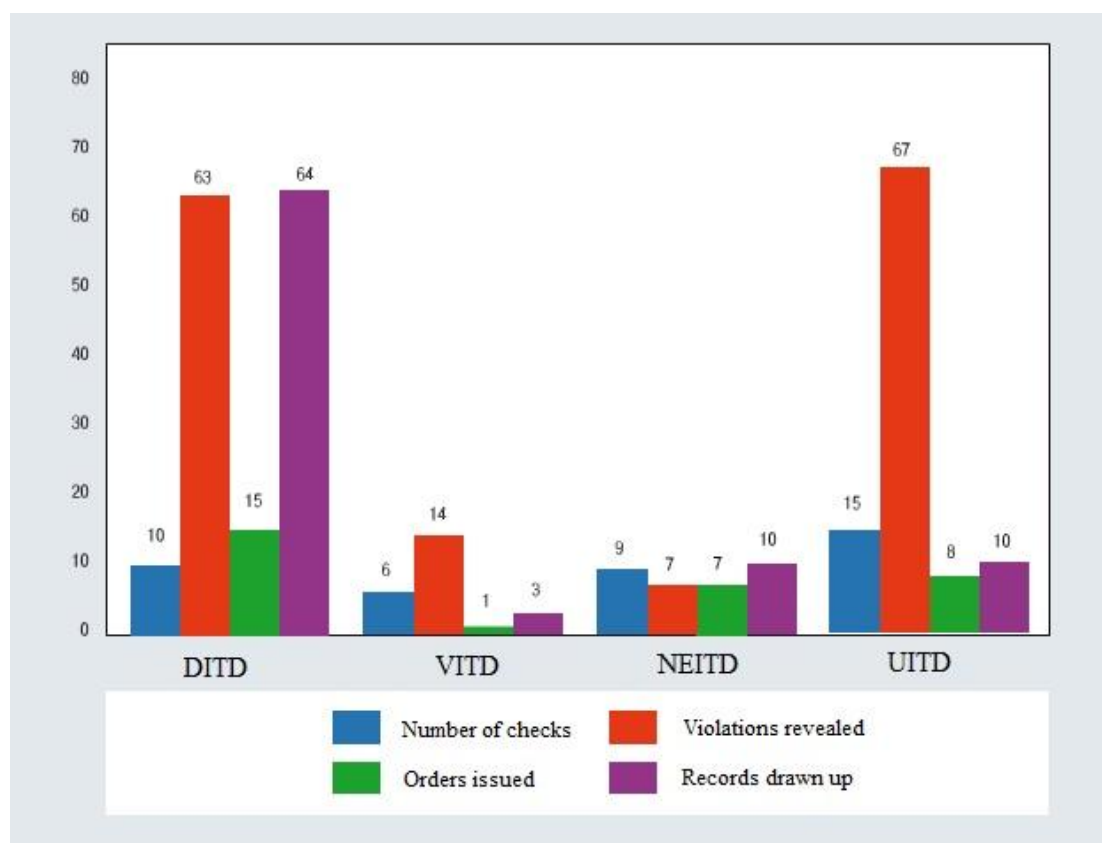
Rostekhnadzor issued the orders on assignment of combined work teams for exercising the state construction supervision at all NPPs under construction, and at operating NPPs where construction of individual facilities is going on. The programs of comprehensive checks during the state construction supervision were developed and approved.

In 2013, within the framework of the state construction supervision 40 checks of NPPs under construction were conducted in accordance with the mentioned programs.

As a result of the checks 151 violations of mandatory requirements of regulatory and legal acts in the field of town-planning activities, construction codes and standards, safety regulations, other regulatory acts, design documentation were revealed, 31 orders on elimination of the revealed violations were issued, 87 records of administrative offenses were drawn up (Figure 3). Implementation of the above mentioned orders will be monitored. The total sum of administrative fines amounted to 8.27 million rubles (Figure 4)

In 2013, no buildings and nuclear power plants were under construction in the territories supervised by the Central ITD NRS, Volga ITD NRS, ITD NRS of Siberia and Far East.

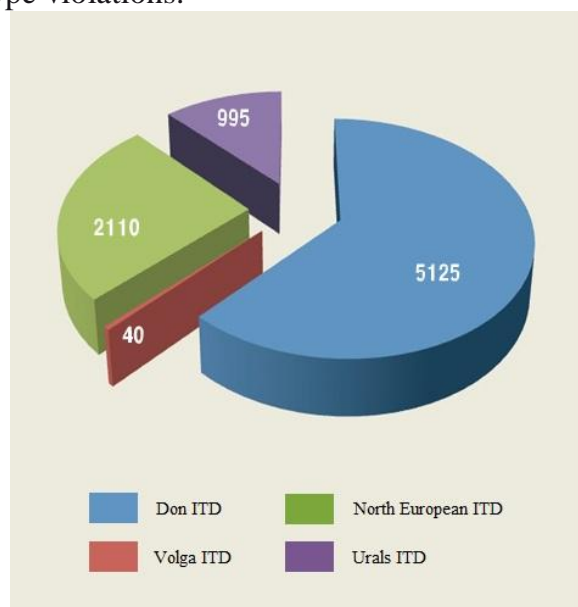




**Figure 3.** Results of the checks conducted within the framework of federal state supervision in 2013.

The difference in quantitative characteristics of the figure is explained by a different number of nuclear facilities in the territories supervised by the territorial departments.

Inconsistency between the number of issued orders and the number of violations revealed in the Urals ITD NRS is explained by the fact that one order was issued for several single-type violations.



**Figure 4.** Administrative fines recovered in 2013 by ITD NRS, thousand rubles

The analysis of inspection reports and orders issued in the reporting period indicated that all of the violations revealed were eliminated by the times set in the action plans for elimination thereof, excluding those violations that were scheduled to be eliminated later.

In the reporting period, based on the results of final checks conducted by North European ITD NRS, conclusions of compliance of capital construction facility with the requirements of the technical regulations (codes and standards), other regulatory legal acts, and the design documentation were issued for the following facilities:



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a complex of systems for spent fuel dry storage and handling with the use of metal-concrete containers at the Leningrad NPP in the town of Sosnoviy Bor, the Leningrad Region, the Leningrad NPP site;

radioactive waste storage and reprocessing facility, the town of Sosnoviy Bor, the Leningrad Region, the Leningrad NPP site.

For the purpose of raising the efficiency of the state construction supervision, on April 11-12, 2013, a workshop with the participation of Rostekhnadzor regional bodies was held on the subject of arrangement and implementation of governmental construction supervision during construction, renovation, and overhaul of buildings and engineering structures of nuclear facilities. Based on the results of the workshop, measures were developed to implement the records of the workshop pertaining to solution of problems that arouse in the process of state construction supervision at nuclear facilities.

To implement the measures envisaged in the records of the workshop, the following actions were taken:

the list of valid federal nuclear codes and standards was updated (September 25, 2013);

Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service to Perform its State Function on Exercising the State Construction Supervision during Construction and Renovation of Capital Construction Facilities indicated in item 5.1 of article 6 of the Town-Planning Code of the Russian Federation, excluding those facilities, the state construction supervision of which is entrusted with other federal executive authorities by the Decrees of the President of the Russian Federation (Rostekhnadzor order No.38 of January 31, 2013 registered with the Ministry of Justice of Russia on July 31, 2013, registration No. 29225);

the issue of arranging supplementary training of ITD NRS inspectors in fire supervision, sanitary-epidemiological supervision, and environmental supervision within the framework of the state construction supervision is being studied;

proposals for updating and improvement of regulatory and legal framework of construction supervision in the field of atomic energy use are being configured.

### **Operational occurrences at nuclear power plants**

In 2013, as in the previous years, no operational occurrences and accidents attributed to A01–A04 accidents and P01 occurrences and having radiation consequences for the population and the environment were registered.

In 2013, 39 operational occurrences accountable for as per the "Provision on the Procedure for Investigation of and Accounting for Operational Occurrences at Nuclear Power Plants" (NP-004-08) took place, which is 12 occurrences less than in 2012 (Figure 5).

Violation of the limits of safe operation was registered during the event that occurred at the Kalinin NPP Unit 1. This violation was classified as Level 1 event on the International nuclear event scale (INES). The remaining 38 violations were classified as "Level 0" events or "not rated on the scale."

Violation of the limits of safe operation was registered during the event that occurred at the Kalinin NPP Unit 4.

All operational occurrences at the NPPs were investigated; investigation reports were reviewed by Rostekhnadzor headquarters and submitted to Scientific and Engineering Centre for Nuclear and Radiation Safety (SEC NRS) for detailed analysis.

In connection with erroneous assessment of the categories of operational occurrences at the NPPs (in accordance with NP-004-08 requirements), in 2013, Rostekhnadzor repeatedly (on three occasions) forwarded the letters on the necessity of additional investigations to JSC Rosenergoatom Concern. Following these investigations the categories of occurrences that

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took place on April 4, 2013 at Kola NPP Unit 2, on April 18, 2013 at Kalinin NPP Unit 4 and on July 23, 2013 at Kalinin NPP Unit 3 were changed. Reports 2KOL-P10-03-04-13, 4KLN-P10-02-04-13 and 3KLN-P04-03-07-13-dop were issued. Thereby, the operating organization recognized the mistakes in classification of these operational occurrences at the NPPs.

In the course of the comprehensive check of JSC Rosenergoatom Concern conducted by Rostekhnadzor commission from November 25, 2013 to December 6, 2013 two operational occurrences requiring investigation and registration as per NP-004-08 (that took place on August 2, 2013 at the Kola NPP Unit 3 and on June 26, 2013 at the Bilibino NPP Unit 2) were revealed. Following additional investigation, report 2BIL- P10-02-06-13 was issued at the Bilibino NPP. The categories of operational occurrences that took place on August 2, 2013 at the Kola NPP Unit 3 and on November 26, 2013 at the Kursk NPP Unit 4 have not been finally defined as yet.

As compared to 2012, the number of operational occurrences accountable for as per NP-004-08 decreased by a factor of 1.3.

The data on the number and classification of operational occurrences at Russian NPPs in 2013 as per NP-004-08 are presented in Table 5.



**Figure 5.** The dynamics of operational occurrences at the NPPs accountable for as per NP-004-08 in 2008-2013

**Table 5**

**The number and classification of operational occurrences at Russian NPPs in 2013**

NPPs and reactor types	Operational occurrences in 2013										Total
	Category of occurrences (as per NP-004-08)										
	P	P02	P03	P04	P05	P06	P07	P08	P09	P10	
WWER, including:	0	1 (1)	1 (0)	1 (1)	0 (0)	3 (12)	2 (1)	3 (9)	3 (8)	4 (0)	18 (32)
The Novovoronezh NPP						0 (4)	0 (1)		0 (3)	1 (0)	1 (8)
The Kola NPP						2 (1)	1 (0)		1 (2)	1 (0)	5 (3)
The Balakovo NPP		0 (1)				1 (1)	1 (0)	1 (0)	0 (2)		3 (4)
Kalinin NPP, Units 1–3		1 (0)		1 (0)		0 (2)		0 (1)	1 (0)		3 (3)

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Kalinin NPP, Unit 4			1 (0)	0 (1)		0 (4)		0 (8)		1 (0)	2 (13)
The Rostov NPP								2 (0)	1 (1)	1 (0)	4 (1)
<b>RBMK, including:</b>	<b>0</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>5 (4)</b>	<b>2 (3)</b>	<b>0 (2)</b>	<b>5 (8)</b>	<b>5 (1)</b>	<b>17 (18)</b>
The Leningrad NPP						2 (1)	0 (2)		3 (3)	3 (0)	8 (6)
The Kursk NPP						1 (2)	1 (0)		2 (4)	1 (0)	5 (6)
The Smolensk NPP						2 (1)	1 (1)	0 (2)	0 (1)	1 (1)	4 (6)
<b>BN-600</b>	<b>0</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>1 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>1 (0)</b>	<b>0 (0)</b>	<b>2 (0)</b>
The Beloyarsk NPP						1 (0)			1 (0)		2 (0)
<b>EGP-6</b>	<b>0</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>1 (1)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>1 (0)</b>	<b>2 (1)</b>
The Bilibino NPP						1 (1)				1 (0)	2 (1)
<b>Total:</b>	<b>0</b>	<b>1 (1)</b>	<b>1 (0)</b>	<b>1 (1)</b>	<b>0 (0)</b>	<b>10 (17)</b>	<b>4 (4)</b>	<b>3 (11)</b>	<b>9 (16)</b>	<b>10 (1)</b>	<b>39*(51)</b>

**Notes:** 1. The categories of two operational occurrences that took place at the Kola NPP and at Kursk NPP Unit 4 have not been finally defined as yet.

2. The figures in parentheses indicate the corresponding number of operational occurrences at the NPPs in 2012

As compared to 2012, the number of operational occurrences in WWER and RBMK reactors decreased, while the corresponding number for EGP-6 reactors increased. In 2013, two operational occurrences were registered at the NPP with BN-600 reactor, while in 2009–2012 there were no operational occurrences at the Beloyarsk NPP.

The distribution of operational occurrences at the NPPs by the types of reactors in 2011–2013 is presented in Table 6

**Table 6**

**Distribution of operational occurrences at the NPPs by the types of reactors  
in 2011–2013**

Reactor types	2011	2012	2013
WWER-440	10	6	5
WWER-1000	22	26	13
RBMK-1000	11	18	17
BN-600	0	0	2
EGP-6	3	1	2
<b>Total:</b>	<b>46</b>	<b>51</b>	<b>39</b>

The majority of operational occurrences took place at:

Kursk NPP Unit 1 (RBMK-1000) - 4 occurrences;

Smolensk NPP Unit 1 (RBMK-1000) - 3 occurrences;

Kola NPP Unit 1 (WWER-440) - 3 occurrences;

Rostov NPP Unit 2 (WWER-1000) - 3 occurrences.

The majority of operational occurrences among NPPs took place at the Leningrad NPP - 8 occurrences, including 3 occurrences in the spent fuel storage facility (SFSF).

One operational occurrence at the Kalinin NPP Unit 3 was associated with failure of safety system channels (failure of two PRZ PORV of the main steam header to open during routine trial run).

15 operational occurrences at the NPPs were associated with safety system actuation, while in 27 % of cases these were false actuations.

23 operational occurrences were accompanied by power Unit load reduction caused by system (component) failures, which is 7 occurrences more than in 2012.

In addition, in 2013 there were three non-scheduled disconnections of the NPP Units from the grid (two violations at the Rostov NPP Unit 1 and one - at the Balakovo NPP Unit 2). In

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2012, 11 similar violations were registered.

### **Scrams**

In 2013, there were 9 operational occurrences accompanied by scrams, including fast power reductions (trips), which is by a factor of 1.45 less than in 2012, when 13 scram, trips occurred.

Such occurrences took place at: the Smolensk NPP Units (one scram and one fast power reduction); the Leningrad NPP (two fast power reductions); the Kalinin, Balakovo, Kola and Bilibino NPPs (one scram each), and the Kursk NPP (one fast power reduction).

Out of the total number of scrams (fast power reductions) eight were associated with the necessity to perform safety functions, and one fast power reduction at the Smolensk NPP power Unit was caused by erroneous personnel actions during work with process protections.

No operational occurrences with scrams were registered in 2013 at the Rostov, Novovoronezh and Beloyarsk NPPs.

### **Personnel errors**

In 2013, there were six personnel errors that became the initiating events of operational occurrences at the NPPs, which amounted to 15 % of the total number of violations (in 2012 there were eight personnel errors).

Operational occurrences associated with personnel errors took place at: the Leningrad NPP (2 occurrences); at the Kalinin, Smolensk, Kursk and Beloyarsk NPPs (one occurrence each).

Out of the total number of occurrences associated with personnel errors three were caused by erroneous accomplishment of process operations during scheduled switchings (2 in the Leningrad NPP SFSF and 1 - at the Kursk NPP Unit), two occurrences were associated with failure to meet the requirements of the instructions during operations aimed at changing the Unit operating mode (at the Kalinin and Smolensk NPP Units), one occurrence was associated with unintentional action applied to protection and automatics components (at the Beloyarsk NPP power Unit).

The main causes of the mentioned operational occurrences associated with the human factor are insufficient training of the operating personnel involved and lack of control of the actions of subordinate personnel on the part of managerial operating staff.

No personnel errors that became initiating events of operational occurrences were registered at the Balakovo, Kola, Bilibino, Novovoronezh and Rostov NPPs in 2013.

In 2013, the most significant operational occurrences at the NPPs (in terms of safety impact and potential consequences) were the following ones:

1. On January 20, 2014, the limit of safe operation of the pressurizer by its level was violated due to erroneous actions of the personnel during the disconnecting the Kalinin NPP Unit 1 from the grid as a result of damage of the coupling bolts of the generator rotor-exciter armature clutch.

The violation was caused by failure of the operating personnel to perform of mandatory actions for shutting down the turbine driven feedwater pumps after actuation of EP-1 and reactor coolant pumps after the steam generator level rise, which resulted in the primary reactor coolant temperature decrease and recession of the pressurizer level below 4000 mm.

2. On April 18, 2013, the limit of safe operation of Kalinin NPP Unit 4 was violated by maximum difference between the temperature of the pressurizer water and the primary reactor coolant, as well as by maximum cooldown rate as a result of failure of the SG-2 primary safety valve to close during routine trial run prior to the Unit startup caused by the ingress of a mechanical particle under the seat of the SG-2 pilot-operated safety valve.

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The causes of the violations consisted in:

failure of the Kalinin NPP personnel to develop sufficiently effective corrective actions for blowdown of stagnant zones of the component coolant system equipment;

deficiencies in the setup performed by the Kalinin subsidiary of JSC Atomtechenergo, caused by weak points in the procedures and termination criteria for assembly cleaning of feedwater pipelines and steam generator vessels.

3. On July 23, 2013, a failure of safety system channels occurred in Kalinin NPP Unit 4: failure of two PRZ PORV MSHs to close during routine trial run after scheduled preventive repair due to insufficient steam flow from PRZ PORV MSH head-end volume through the injection valve as a result of non-compliance of the injection valve electrical magnet slider rated stroke with the requirements of the engineering documentation.

The causes of the violations consisted in:

failure to verify the compliance of electrical magnet slider rated stroke with technical requirements of the drawing during the injection valve assembly in the course of scheduled preventive repair due to the lack of corresponding instructions in the repair documentation;

insufficient analysis by the Kalinin NPP personnel of completeness of check operations in the repair documentation during its development, coordination, putting in force, scheduled revision and use.

Out of 39 operational occurrences rated on the International nuclear event scale (INES), one occurrence is qualified as "Level 1" (at the Kalinin NPP Unit 1), 27 - as "Level 0", and 11 - "not rated on the scale."

Distribution of operational occurrences at the NPPs by immediate causes is presented in Table 7

**Table 7**

**Distribution of operational occurrences at the NPPs by immediate causes  
in 2011 - 2013**

No.	Immediate causes of occurrences	2011	2012	2013
1	Mechanical phenomena, processes, conditions	1	1	1
2	Electrical phenomena, processes, conditions	2	1	1
3	Chemical phenomena and processes, reactor physics	0	0	
4	Hydraulic phenomena, processes	1	3	2
5	Phenomena, processes in monitoring systems	0	8	2
6	Equipment environmental conditions	0	0	
7	Abnormal environmental conditions outside the NPP compartments	1	0	
8	Human factor	6	8	3
9	Not identified	1	0	1
	<b>Total:</b>	<b>4</b>	<b>5</b>	<b>3</b>

In 2013, the majority of operational occurrences at the NPPs were caused by malfunctions related to electrical and mechanical phenomena, processes and conditions. In 2011 -2012, the majority of immediate causes of occurrences were also associated with these factors. At the same time, in 2013 the number of occurrences associated with mechanical processes, increased by a factor of 1.36, while those associated with electrical processes decreased by a factor of 1.5. The number of occurrences resulting from the processes in monitoring systems decreased from eight in 2012 to two in 2013, and the number of occurrences associated with

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the human factor decreased from eight to three.

In 2013, the majority of operational occurrences at the NPPs were caused by such factors as deficiencies of control and arrangement of operation, manufacturing defects, and equipment design errors.

Breakdown of operational occurrences at the NPPs is presented in Table 8

*Table 8*

**Breakdown of operational occurrences at the NPPs by root causes**

No.	Cause of occurrences	2011	2012	2013
1	Equipment design error	5	9	4
2	Design error	7	9	2
3	Manufacturing defect	9	4	8
4	Construction drawbacks	0	0	0
5	Assembly drawbacks	4	2	3
6	Adjustment drawbacks	1	0	0
7	Drawbacks of repair performed by outside organizations	1	1	1
8	Drawbacks of design, engineering and other documentation	1	2	3
9	Deficiencies of control and arrangement of NPP operation	13	19	16
10	Not identified	5	5	2
	<b>Total:</b>	<b>46</b>	<b>51</b>	<b>39</b>

Following the investigation of the mentioned NPP operational occurrences, JSC Rosenergoatom Concern developed appropriate corrective measures to prevent the repetition of similar events and implements these measures.

Implementation of corrective measures for elimination of the causes of violations is monitored by the divisions for inspections of NPP nuclear and radiation safety and in the course of dedicated inspections conducted by Rostechнадзор territorial bodies for nuclear and radiation safety supervision.

Figure 5 indicates the number of violations that took place in 2008 - 2013 without taking into account the incidents at the Rostov NPP Unit 2 (9 violations in 2010) and the Kalinin NPP Unit 4 (4 violations in 2011 and 13 violations in 2012): these Units were at the trial commercial operation stage.

Analysis of NPP operational occurrences that took place in 2013 demonstrates that their number, without taking into account the incidents that occurred at the power Units that were at the trial commercial operation stage, has practically remained unchanged as compared to 2010 -2012 data.

**Radioactive releases and discharges**

The values of releases of inert radioactive gases (IRG) and aerosols from Russian NPPs in 2013 versus maximum permissible annual releases specified by Rostechнадзор regional bodies in accordance with the Resolution of the Government of the Russian Federation No.183 of March 2, 2000, "On Limit Values for Releases of Noxious (Contaminating) Substances in to the Atmospheric Air and Adverse Physical Impacts on it," are presented in Table 9.

*Table 9*

**The values of releases of inert radioactive gases (IRG) and aerosols from Russian NPPs in 2013 versus maximum permissible annual releases (MPR)**

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NPPs	IRG	I-131	Co-60	Cs-134	Cs-137
	TBq (% of MPR)	MBq (% of MPR)			
NPPs with WWER-1000 and WWER-440 reactors					
The Balakovo NPP	Below instrument sensitivity	Below instrument sensitivity	2.6 (0.01)	0.01 (0.0003)	1.3 (0.02)
The Kalinin NPP	3.7 (0.03)	682 (0.02)	1.4 (0.001)	10.9 (0.1)	16.4 (0.04)
The Novovoronezh NPP	8.2 (0.1)	74 (0.02)	600 (0.4)	51 (0.3)	140 (0.4)
The Rostov NPP	3.9 (0.1)	21.4 (0.02)	Below instrument sensitivity		0.3 (0.003)
The Kola NPP*	Below instrument sensitivity	Below instrument sensitivity	Below instrument sensitivity	Below instrument sensitivity	Below instrument sensitivity
NPPs with RBMK-1000 reactor					
The Kursk NPP*	552 (0.8)	5039 (0.3)	Below instrument sensitivity	Below instrument sensitivity	Below instrument sensitivity
The Leningrad NPP	73 (0.1)	Below instrument sensitivity	75 (0.2)	3.1 (0.01)	8.1 (0.01)
The Smolensk NPP*	35.4 (0.05)	12 (0.001)	74.9 (0.2)	Below instrument sensitivity	1.4 (0.002)
NPP with AMB-100, AMB-200 and BN-600 reactors					
The Beloyarsk NPP	2.8 (0.2)	Below instrument sensitivity	0.02 (0.0001)	Below instrument sensitivity	1.2 (0.01)
NPP with EGP-6 reactor					
The Bilibino NPP	486 (1.3)	Below instrument sensitivity	≤14.6** (3.8)		

\*MPR for the Kola, Kursk and Smolensk NPPs are at present at the stage of preparation and approval, therefore, the MPRs from these NPPs are set as per SP AS-03 specifications.

\*\*Co-60, Cs-134 and Cs-137 content in the Bilibino NPP releases is below minimum detectable activity. Therefore, the Table shows gross activity of long-lived radionuclide in the releases.

During the reporting period gas and aerosol releases from NPPs were lower than MPR values and did not exceed IRG releases by 1.3 % (the Bilibino NPP), I-131 - (the Kursk NPP), Co-60 - 0.4 % (the Novovoronezh NPP), Cs-134 - 0.3 % (the Novovoronezh NPP) and Cs-137 - 0.4 % (the Novovoronezh NPP).

The volume of liquid discharges into the environment and radionuclide ingress in the surface water relative to permissible discharge (PD) calculated and approved by Rostekhnadzor for each NPP in accordance with the Resolution of the Government of the Russian Federation No. 469 of July 23, 2007, "On the procedure for approval of limiting

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values of permissible discharges of substances and microorganisms into water bodies of water consumers," are presented in Table 10.

For all NPPs, except the Bilibino NPP, the data are given for Cs-137, which is the main contributor (up to 70 %) to the gross activity of the discharge water. For the Bilibino NPP the radioactivity data for discharge water are indicated for Co-60, the contribution of which to the gross activity amounts to 75 %.

**Table 10**

**The volume of liquid discharges into the environment and radionuclide ingress in the surface water relative to permissible discharge (PD) calculated and approved for each NPP**

<b>NPPs</b>	<b>Discharge water volume, m<sup>3</sup></b>	<b>Radionuclide ingress, MBq (% of PD)</b>
<b>NPPs with WWER-1000 and WWER-440</b>		
The Balakovo NPP*	17,970	2.2 (2)
The Kalinin NPP	3,081	10.8 (0.3)
The Novovoronezh NPP	69,000	39 (0.9)
The Rostov NPP*	62,500	142 (17.3)
The Kola NPP	7,547	0.2 (0.0005)
<b>NPPs with RBMK-1000</b>		
The Kursk NPP	52,300	Below the instrument sensitivity
The Leningrad NPP**	—	—
The Smolensk NPP	47,329	4.4 (0.2)
<b>NPP with AMB-100, AMB-200 and BN-600</b>		
The Beloyarsk NPP	86,469	62 (2.1)
<b>NPP with EGP-6 reactor</b>		
The Bilibino NPP	2,291	4.8 (0.03)

\* Residual waters of the Balakovo and Rostov NPPs are discharged to spray ponds.

\*\* Residual waters of the Leningrad NPP are discharged to cooling towers of Leningrad specialized plant Radon.

Actual values of radionuclide activity in liquid discharges from the NPPs were below permissible values and did not exceed 17.3 % of PD value (the Rostov NPP).

### **Radioactive waste**

Information on filling of liquid waste storage facilities (LWSF) and solid waste storage facilities (SWSF) in Russian NPPs as of December 31, 2013 is presented in Tables 11–12.

**Table 11**

**Information on filling of liquid waste storage facilities (LWSF) in Russian NPPs**

<b>NPP</b>	<b>LWSF capacity, m<sup>3</sup></b>	<b>LW volume, m<sup>3</sup></b>	<b>LWSF filling, %</b>
<b>NPPs with WWER-1000 and WWER-440</b>			
The Balakovo NPP	3,800	1,196	31.5
The Kalinin NPP	3,436	2,444	71.1
The Novovoronezh NPP	17,891	6,710	37.5
The Rostov NPP	800	401	50.1
The Kola NPP	8,896	6,593	74.1
<b>NPPs with RBMK-1000</b>			
The Kursk NPP	70,400	43,325	61.5
The Leningrad NPP	21,920	17,622	80.4
The Smolensk NPP	19,400	17,168	88.5

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<b>NPP with AMB-100, AMB-200 and BN-600</b>			
The Belayarsk NPP	6,050	4,180	69.1
<b>NPP with EGP-6 reactor</b>			
The Bilibino NPP	1,000	697	69.7

LWSF filling ratio at the NPPs averaged 63.4 %. However, the LWSFs of the Smolensk NPP and Leningrad NPP were 88.5 % and 80.4 % full, respectively.

*Table 12*

**Information on filling of solid waste storage facilities (SWSF) in Russian NPPs**

<b>NPPs</b>	<b>SWSF capacity, m<sup>3</sup></b>	<b>SW volume, m<sup>3</sup></b>	<b>SWSF filling, %</b>
<b>NPPs with WWER-1000 and WWER-440</b>			
The Balakovo NPP	42,300	19,240	45.5
The Kalinin NPP	21,302	10,035	47.1
The Novovoronezh NPP	54,543	47,336	86.8
The Rostov NPP	8678	691	8
The Kola NPP	47,068	13,366	28.4
<b>NPPs with RBMK-1000</b>			
The Kursk NPP	34,985	28,517	81.5
The Leningrad NPP	50,242	41,991	83.6
The Smolensk NPP	16,060	13,747	85.6
<b>NPP with AMB-100, AMB-200 and BN-600</b>			
The Belayarsk NPP	22,160	14,932	67.4
<b>NPP with EGP-6 reactor</b>			
The Bilibino NPP	6,330	4,006	63.3

SWSF filling ratio at the NPPs averaged 59.7 %. However, the SWSFs of the Novovoronezh, Smolensk, Leningrad and Kursk NPPs were, respectively, 86.8; 85.6; 83.6 and 81.5 % full.

High percentage of filling of radioactive waste storage facilities confirms that JSC Rosenergoatom Concern must revise the programs of RW management at nuclear power plants and find a comprehensive solution of the problems associated with RW reprocessing before expiration of the terms of RW intermediate storage for conditioning thereof and subsequent disposal.

**Radiation burden on the plant personnel and temporarily assigned persons**

Collective and average individual dose values for the plant personnel and the persons temporarily assigned to work at the NPPs in Russia are presented in Table 13.

*Table 13*

**Collective and average individual dose values for plant personnel and the persons temporarily assigned to work at the NPPs in Russia**

NPPs	Number of persons monitored		Collective dose, man Sv	Average individual dose, mSv
NPPs with WWER-1000 and WWER-440				
The Balakovo NPP	Plant pers.	2,106	0.5	0.24
	Assigned pers.	1,651	0.72	0.44
	Total	3,757	1.22	0.32

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The Kalinin NPP	Plant pers.	2,544	0.74	0.29
	Assigned pers.	1,292	0.18	0.14
	Total	3,836	0.92	0.24
The Novovoronezh NPP	Plant pers.	1,994	2.98	1.49
	Assigned pers.	1,454	1.5	1.03
	Total	3,448	4.48	1.3
The Kola NPP	Plant pers.	1,525	1.58	1.04
	Assigned pers.	861	1.15	1.33
	Total	2,386	2.73	1.14
The Rostov NPP	Plant pers.	1,111	0.1	0.09
	Assigned pers.	775	0.12	0.15
	Total	1,886	0.22	0.12
<b>NPPs with RBMK-1000</b>				
The Kursk NPP	Plant pers.	3,329	6.15	1.85
	Assigned pers.	3,132	9.26	2.96
	Total	6,461	15.41	2.39
The Leningrad NPP	Plant pers.	4,053	6.23	1.54
	Assigned pers.	2,180	3.56	1.63
	Total	6,233	9.79	1.57
The Smolensk NPP	Plant pers.	3,094	5.97	1.93
	Assigned pers.	3,422	4.23	1.24
	Total	6,516	10.2	1.57
<b>NPP with AMB-100, AMB-200 and BN-600</b>				
The Belyarsk NPP	Plant pers.	1,560	0.48	0.31
	Assigned pers.	841	0.23	0.26
	Total	2,401	0.71	0.3
<b>NPP with EGP-6 reactor</b>				
The Bilibino NPP	Plant pers.	485	1.73	3.57
	Assigned pers.	311	0.48	1.54
	Total	796	2.21	2.78

In the reporting period, maximum individual radiation doses during repair of equipment were received by the Bilibino NPP personnel (3.57 mSv) and persons temporarily assigned to the Kursk NPP (2.96 mSv).

In the reporting period at the NPPs in Russia there were no registered cases of exceeding the average value of radiation dose limit for Group A personnel in any consecutive 5 years established by NRB-99/2009 as 20 mSv per year.

### **The results of IAEA mission to analyze the fulfillment of recommendations made by the November 2009 IAEA Integrated Regulatory Review Service Mission**

Following the IAEA mission held in 2009 to analyze the efficiency of Russian nuclear safety regulatory system, international experts prepared a report containing recommendations and suggestions for its enhancement. For the purpose of fulfillment of these recommendations and suggestions, Rostekhnadzor developed an Action Plan containing 46 actions, the implementation of which has been basically completed by now. The regulatory framework was improved, as a result of which Rostekhnadzor consolidated its position of an actually independent regulatory authority directly subordinate to the Government of the Russian Federation. Amendments empowering Rostekhnadzor to bring the offenders to responsibility were made in the Code on administrative offenses. Events aimed at the exchange of

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experience with foreign supervisory bodies are regularly held, in particular, joint inspections were conducted with the participation of Finnish and French supervisory bodies.

IAEA follow-up mission that was held in Russia as scheduled, four years later, in November of 2013, analyzed the extent to which Rostekhnadzor fulfilled the recommendations and suggestions of the previous mission and assessed Rostekhnadzor activities in additional directions: emergency preparedness and response; lessons learnt from Fukushima accident for the regulatory body.

In the course of IAEA follow-up mission, Rostekhnadzor participated in an emergency exercise at the Novovoronezh NPP of JSC Rosenergoatom Concern, the process of which was observed by IAEA experts.

The members of IAEA follow-up mission appreciated Rostekhnadzor efforts to improve the state nuclear safety regulation system and acknowledged that the absolute majority of the 2009 mission recommendations were implemented.

In addition, the experts of IAEA follow-up mission noted the timeliness and effectiveness of Program of actions aimed at participation of Russian stakeholders in implementation of IAEA Action Plan on Nuclear Safety. This Program developed by Rostekhnadzor in the wake of Fukushima accident includes, among other measures, additional assessment of safety status of the NPPs that are in operation or at the stage of construction.

The experts also emphasized that Rostekhnadzor continues its efforts to improve the regulatory and legal basis with due regard of IAEA safety standards to assure stable regulatory regime of nuclear and radiation safety in relation to all kinds of activity in the field of atomic energy use.

As a result of IAEA follow-up mission, recommendations and suggestions for further improvement of the effectiveness of Rostekhnadzor regulatory activity were elaborated, and good practices were defined that might be recommended for use by the regulatory bodies of other IAEA member-states in their nuclear safety regulatory activities.

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### *2.2.2 Nuclear fuel cycle facilities*

In 2013 Rostekhnadzor supervised 17 industrial nuclear fuel cycle facilities (NFCF), 109 research and development and design organizations, organizations that fulfill the works and deliver services to NFCF including those that are engaged in transportation and storage of nuclear materials and carry out other works for the nuclear fuel cycle facilities based on the licenses of the Rostekhnadzor headquarters.

Among the supervised facilities were:

15 commercial reactors, 2 of which were at the operation stage, 3 were in the final shutdown mode and 10 were at the stage of decommissioning.

26 nuclear installations for nuclear material reprocessing (natural uranium mining and processing, sublimate production, separation of uranium isotopes, chemical-metallurgical and radiochemical production, production of nuclear fuel, processing of spent nuclear fuel);

15 nuclear installations for research and development work involving nuclear materials;

39 storage facilities for nuclear materials, spent nuclear fuel and radioactive waste including 3 underground disposal facilities for liquid radioactive waste.

Within the reporting period the Rostekhnadzor Headquarters issued 51 licenses for the right to execute the activities in the field of atomic energy use at nuclear fuel cycle facilities (cf. 52 licenses in 2012).

In 2013 the Rostekhnadzor's interregional territorial departments for nuclear and radiation safety supervision (ITD NRS) issued 127 licenses for the right to execute the activities in the field of atomic energy use at nuclear fuel cycle facilities (cf. 144 licenses in 2012).

In accordance with the dates specified in the Plan of Inspections of legal entities and individual entrepreneurs to be conducted by the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in 2013, Rostekhnadzor arranged and conducted inspections to check implementation of federal codes and standards in the field of atomic energy use and validity terms and conditions of licenses issued to JSC "Siberian Chemical Combine" (JSC SCC), JSC "Ural Electrochemical Integrated Plant" (JSC UEKhK), JSC "Leading Research Institute of Chemical Technology" (JSC VNIKhT), JSC "Angarsk Electrolysis Chemical Factory" (JSC "AEKhK"), FSUE "Russian Federal Nuclear Center - The All-Russian Research Institute of Experimental Physics" (FSUE RFNC - VNIIEF), JSC TVEL, JSC "State Scientific Center - Scientific Research institute of Nuclear Reactors" (JSC GNTs-NIIAR).

Altogether 7 inspections were conducted by the Rostekhnadzor Headquarters at NFCF in 2013 (cf. 6 inspections in 2012). No inspections of the ITD NRS structural units were conducted in 2013.

576 inspections were conducted by the ITD NRS at nuclear fuel cycle facilities within the reporting period; 105 inspections of this number were scheduled and 471 inspections were non-scheduled. 335 violations of codes and standards in the field of atomic energy use were found during inspections;

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124 order statements were issued for elimination of these violations. There wasn't any order statements that were not implemented in the due time.

The results of the ITD NRS inspection activities are presented in Table 14.

**Table 14**

***The results of the ITD NRS inspection activities***

<b><i>Indicators</i></b>	<b><i>VITD</i></b>	<b><i>SITD</i></b>	<b><i>NEITD</i></b>	<b><i>UITD</i></b>	<b><i>CITD</i></b>	<b><i>DITD</i></b>	<b><i>Total</i></b>
Inspections conducted at NFCFs including:	72	262	14	166	62	0	576
Scheduled	1	49	1	16	38	0	105
Unscheduled	71	213	13	150	24	0	471
Violations revealed	51	124	0	131	29	0	335
Order statements issued on results of inspections conducted	10	53	0	35	26	0	124
Warnings given	0	1	0	0	0	0	1
Administrative suspension of activities	0	0	0	0	0	0	0
Administrative fines imposed	3	6	0	9	1	0	19
Materials handed to the law-enforcement bodies	0	0	0	0	0	0	0

According to the Code of Administrative Violations, relevant sanctions were imposed on the NFCFs and the organizations carrying out activities and rendering services for NFCEs as well as to the officials of these organizations for their failure to comply with the requirements of codes and standards in the field of atomic energy use and license validity terms and conditions.

Most violations of federal codes and standards in the field of atomic energy use are related to maintenance and repair of equipment, the state of technical documentation, the state of organizational and administrative documents as well as radiation safety assurance. The analysis of the causes of violations of federal codes and regulations in the field of atomic energy use demonstrates that the major causes of violations were mainly related to poor personal implementation and were due to insufficient departmental monitoring by companies' technical divisions and administrative departments, as well as were caused by improper implementation of one's job functions.

The nature of the found violations hasn't undergone significant changes in recent years.

The indicators of licensing and supervisory performance over the period under review are rather stable on the whole. An increase in the number of violations of federal codes and regulations in the field of atomic energy use and license validity terms and conditions is related to accounting of supervisory activities' indicators in the reports in the regime of continuous supervision at nuclear facilities.

For all revealed cases of violations the instructions and order statements were issued, the specific terms for elimination of violations were determined and elimination of violations was monitored. Order statements were mainly implemented within the prescribed time periods.

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In 2013, 491 non-scheduled inspections were performed to verify authenticity of the information provided by the companies in order to obtain a license or amend the license validity terms and conditions.

Scheduled inspections were performed in accordance with the Federal Environmental, Industrial and Nuclear Supervision Service of Russia Plan for Scheduled Inspections of Legal Entities and Individual Entrepreneurs for 2013. All scheduled inspections were conducted.

Inspections in the framework of the continuous state supervision regime were conducted in accordance with action plans of the structural units of the Rostekhnadzor IRD NRS.

Inspections in the framework of the continuous state supervision were conducted to check the following:

- implementation of the earlier issued statements of orders to remove the violations observed in respect of mandatory requirements and license validity terms and conditions;

- implementation of the codes and regulations in the field of atomic energy use;
- compliance with the procedure of maintenance and repair of equipment and systems at nuclear facilities;

- implementation of safety assurance measures at nuclear facilities;
- maintaining the necessary characteristics of the systems and their elements related to safety assurance of nuclear facilities;

- organization of the system for selection, training, testing and work authorization of plant personnel;

- compliance with the requirements of operation and process documentation;
- compliance with validity terms and conditions of licenses and permits for the right to conduct

the activities in the field of use of atomic energy issued to the employees of nuclear facilities;

- making arrangements for accident prevention and preparedness of organizations for the elimination of accident effects;

- adherence to the rules of the radioactive waste management procedure.

No accidents occurred at nuclear fuel cycle facilities in 2013 just as in the previous years. 5 occurrences were registered (cf. 4 occurrences in 2012), of which:

- three didn't result in any radiation and other consequences and are characterized by level "0" as per International Nuclear Event Scale (INES), i.e. "not significant for safety";

- two resulted in local radiation consequences at FSUE PA "Mayak" (one of the occurrences took place in 2012 but was revealed in 2013).

One of 5 occurrences which took place in 2013 was caused by technical reasons due to failure of equipment, 4 occurrences were caused by personnel errors including failure to comply with the requirements of operation documentation.

On January 25, 2013 a train with the special car containing radioactive materials collided with the snow plow. No consequences for the cargo or the special car after the collision were registered, the train continued following its route.

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On March 29, 2013 a cladding tube stuck in one of the container cells during unloading of the transport vehicles containing spent fuel assemblies arrived from FSUE "Atomflot" at FSUE PA Mayak. Unloading of the container with the stuck cladding tube was suspended until the failure causes have been found and eliminated. This occurrence didn't affect the safety of the activities being carried out.

In June 2013 during examination in the internal radiation monitoring laboratory of FSUE "South-Ural Institute of Biophysics" the consequences of the actinide contamination of the right hand microtrauma of V.Dobrov, maintenance fitter working in Shop 2 of plant 235 of FSUE PA Mayak, were evaluated. The employee sustained the microtrauma in December 2012. Based on the examination results, the expected effective internal exposure dose caused by the radionuclides incoming into the employee's body made up 330 mSv, which exceeds the dose limit for the annual effective exposure dose of personnel caused by normal operation of anthropogenic ionizing radiation sources established by item 3.1.5 of Radiation Safety Standards (NRB-99/2009).

On June 9, 2013 a process solution containing fission materials was spilled at FSUE PA Mayak into the process compartments of shop 2 at plant 20 due to the equipment seal failure. This occurrence resulted in radioactive contamination of process compartments but didn't entail radiation impact on the personnel beyond the established norms specified by the federal codes and regulations in the field of atomic energy use. Based on the results of the committee's activities on investigation of the occurrence at FSUE PA Mayak, the category "plant-level occurrence" was assigned to the occurrence. FSUE PA Mayak contrary to the requirements of federal codes and regulations didn't notify the organizations concerned including Rostekhnadzor about this occurrence (they didn't send operational and preliminary messages, as well as a report on investigation of the occurrence).

As soon as the report on investigation of the occurrence was received by the Ozersk Inspection Department, an inspection was performed in the framework of the continuous state supervision accompanied with review of the following documents: explanatory notes of employees, job order-authorizations for the right of performing the activities in the conditions of higher radiation hazard, information notes on contamination of equipment and compartments issued during execution of activities related to collection of the spilled solution and its decontamination, as well as provisions, instructions and other technical documentation.

The analysis of the occurrence investigation materials revealed a number of violations of federal codes and regulations in the field of atomic energy use pertaining to quality assurance during equipment operation, announcement system and procedure of investigation in case of abnormal operational occurrences, as well as development of measures aimed at prevention of similar occurrences in future.

Based on the results of review and analysis of the report on investigation of the occurrence, Rostekhnadzor sent a letter to FSUE PA Mayak with a proposal to revise the category of the occurrence as per requirements of items 2.1 and 4.16 of the Provisions for the procedure of investigation and accounting of operational occurrences at nuclear fuel cycle facilities (NP-047-03).

On June 20, 2013 an unscheduled reactor plant power reduction to 0% occurred at reactor plant LF-2 of FSUE PA Mayak. It was caused by the coolant system

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power cutoff. This occurrence didn't affect the safety of the reactor plant, the production processes were continued in the mode provided for by the regulations.

### ***Decommissioning of commercial uranium-graphite nuclear reactors***

At the present time 10 commercial uranium-graphite nuclear reactors (hereinafter called CUGR) are being decommissioned, 3 CUGR are in the final shutdown mode. All the commercial uranium-graphite nuclear reactors are brought to nuclear-safe condition and are at the stage of preparation for long-term cooling. After unloading of the fuel, the relevant conclusions on nuclear safety of the graphite stacks of these reactors were received. Radiation situation in the last years at the commercial uranium-graphite nuclear reactors, which are in the process of decommissioning, is characterized as stable; effective personnel exposure dose never exceeds the established limits.

No operational occurrences were registered involving the systems and equipment important for safety.

FSUE "The Mining and Chemical Combine" (FSUE GKKhK) carried out activities related to decommissioning of commercial reactors AD and ADE-1 remaining at the stage of continuation of activities of stage II (preparation of reactor plants for long-term cooling).

Radiation burden on the personnel does not exceed the limits of control levels established at the enterprises.

Operation, maintenance, inspection, checks and tests of systems important to safety shall be conducted in accordance with the established procedures.

No operational occurrences were registered involving the systems and equipment important for safety of shutdown reactors. Inspection of the state of the basic metalwork of AD and ADE-1 reactors shall be performed in accordance with the requirements of the company's instructions.

All radiation-hazardous activities are carried out based on the dosimetry work orders. No radiation safety occurrences were registered during arrangement and execution of activities.

The ADE-2 CUGR was shut down at FSUE GKKhK on April 14, 2010 for decommissioning.

In the framework of implementation of the state contract, JSC "Experimental and demonstration center for decommissioning of uranium-graphite nuclear reactors" (JSC

"ODC UGR") basing on the Rostekhnadzor license started implementation of activities on dismantling of the specific equipment and performance of a comprehensive examination of the ADE-2 CUGR.

The reactor factory JSC "SKhK", and now JSC "ODC UGR" jointly with JSC "SKhK" carried out activities on operation in the final shutdown mode and decommissioning of three commercial reactors based on the Rostekhnadzor licenses.

Two sites (No.2 and No.11) have been combined in the structure of the Reactor Factory JSC "SKhK" (RF JSC SKhK). Two CUGRs, and namely ADE-4 (shut down on April 20, 2008) and ADE-5 (shut down on June 5, 2008) are located at Site No.11 of the Reactor Factory. They are being operated in the final shutdown mode. Three shutdown CUGRs (I-1, EI-2 and ADE-3) being at the decommissioning state are located at site No.2 of the Reactor factory.

Since the validity term of the Rostekhnadzor's license for decommissioning of structures and a set of facilities with I-1 and ADE-3 CUGRs expired on December 31, 2012, the activities related to decommissioning of the reactors were suspended by the JSC SKhK order until obtaining of a Rostekhnadzor's license.

The shipping and process canisters of the ADE-4 and ADE-5 reactors were cleaned of the silt deposits. All nuclear materials from the ADE-4 and ADE-5 reactors were moved to site No.2.

Radiation burden on the personnel does not exceed the specified limits of control levels. The existing system for nuclear and radiation safety assurance at RF JSC SKhK within the reporting period mainly meets the requirements of the applicable codes and regulations in the field of atomic energy use.

There are 5 CUGRs shut down for decommissioning at FSUE PA Mayak: AV-1 and AV-2 of Factory 23 and A, AI and AV of Factory 156. The CUGRs were transferred into the nuclear-safe state; they are now at the stage of long-term storage under surveillance.

The radiation environment at the workplaces within 2013 hasn't deteriorated as compared to the periods of 2007-2012. No exceeding of the basic exposure dose limits and reference staff exposure levels was registered.

In 2009, the Deputy Director General of the State Corporation Rosatom approved the branch "Concept for decommissioning of commercial uranium-graphite nuclear reactors for the case of on-site safe disposal" developed jointly with the Federal Budgetary Enterprise "Scientific and Engineering Center for Nuclear and Radiation Safety".

According to the Concept on AV-1 and AV-2 reactors, the following documents were elaborated: Decommissioning program for commercial uranium-graphite reactor AV-1;

Decommissioning program for commercial uranium-graphite reactor AV-2.

The design documentation for decommissioning of the AV-1 reactor was approved; positive conclusion of the Department of Capital Construction (DCC) of the State Corporation Rosatom was obtained. The designing estimates for reconstruction of the AV-1 CUGR ground water discharge system were developed and approved by the DCC of the State Corporation Rosatom. The "Master-plan of measures on decommissioning of the AV-1 CUGR" and a set of working documentation for reconstruction of the AV-1, AV-2 CUGR system of ground water discharge into the special industrial water basin were developed.

The designing estimates for reconstruction of the AV-2 CUGR ventilation system were developed and approved by the DCC.

The systems of nuclear and radiation safety assurance at the commercial reactors being decommissioned in the reporting period met the requirements of the applicable codes and regulations in the field of atomic energy use as well as license validity terms and conditions.

### ***Decommissioning of nuclear fuel cycle facilities***

FSUE GKhK completed the activities related to decommissioning (mothballing) of open storage pool for liquid radioactive waste No. 354a (as part of facility 354). Storage pool for liquid radioactive waste (LRW) No. 354a was classified as an indoor storage facility for solid radioactive waste (contaminated earth storage facility).

Decommissioning was carried out at JSC GMZ of the radwaste tailings storage of the former uranium mining enterprise in accordance with the design that passed the state environmental impact assessment. Based on the results of the radiation monitoring conducted in 2013, no exceeding of the controlled parameters' values established by radiation safety standards was registered.

Work was continued in the JSC "Novosibirsk Chemical Concentrates Plant" (JSC NZKhK) in 2013 to prepare for decommissioning of CUGR fuel elements' production facilities.

Work was conducted at JSC "A.A. Bochvar High-technology Research Institute of Inorganic Materials" (JSC VNIINM) in 2013 to prepare for decommissioning of Building B. A comprehensive engineering radiation survey was carried out and the decommissioning program was developed. Preparatory measures permitted by the license validity terms and conditions are in progress. The decommissioning project was submitted for environmental impact assessment.

JSC SKhK carried out activities related to mothballing of radioactive waste storage facilities - pools B-1 and B-2 located at site 18a of shop No.4 of the Radiochemical Plant SKhK.

### ***Spent nuclear fuel (SNF) management***

Over the reporting period SNF from foreign NPPs was imported in accordance with the Regulations approved by Resolution of the Government of the Russian Federation dated 11.07.2003 No. 418, the Procedure of acceptance for further processing at Russian enterprises of spent nuclear fuel from foreign nuclear power plants and return of radioactive wastes and materials generated by reprocessing as approved by Resolution of the Government of the Russian Federation dated 29.07.95 No. 773, as well as on the basis of Rostekhnadzor permits for importation and further processing of irradiated fuel assemblies. Spent fuel was received according to the annual schedule and spent fuel importation limit approved by the Government of the Russian Federation.

FSUE PA Mayak was involved in storage of the spent fuel brought into the pool-type storage followed by its subsequent reprocessing at the company's radiochemical plant.

No violations of safe operation limits were recorded in the reporting period. FSUE "The Mining and Chemical Combine" (FSUE GKKhK) was involved in storage of the VVER-1000 spent fuel assemblies in the SF storage facility pool.

The spent fuel assemblies from the nuclear power plants of Russia, Ukraine, Bulgaria as well as the storage tubes containing the fuel elements of the irradiated fuel assemblies studied at FSUE GNTs NIAR are being received for storage. Conclusions of the State Environmental Impact Assessment were received in relation to implementation of activities in the field of atomic energy use:

Reconstruction of the "wet" storage facility for VVER-1000 irradiated nuclear fuel at plant RT-2 (building No.1) of FSUE GKKhK was approved by Order of the Federal Service for Supervision in the Sphere of Natural Resource Use No. 528 of September 28, 2012.

### ***Operation of nuclear material storage facility***

A document assigning a facility, where or in relation to which the declared activity is to be performed: a fixed structure designed for storage of nuclear

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materials, a storage facility for irradiated fuel assemblies of VVER-1000 reactors containing spent nuclear fuel, was approved by Order of the Federal Service for Supervision in the Sphere of Natural Resource Use No. 585 of November 1, 2012. FSUE GKKhK developed a plan of development and localization of the beyond design basis accident accompanied with de-watering of the storage pools for the wet storage facility for spent fuel assemblies to enable control of beyond design basis accidents.

No violations of the safe conditions of the SNF storage facilities' operation were registered within the reporting period.

The existing system of nuclear and radiation safety assurance at the storage facility for spent fuel assemblies of VVER-1000 reactors containing spent nuclear fuel at FSUE GKKhK in the reporting period on the whole met the requirements of the applicable codes and regulations in the field of atomic energy use as well as license validity terms and conditions and is considered as satisfactory.

The dry storage facility of the irradiated nuclear fuel (SFIF-2) is intended for technological storage of SNF of RMBK-1000 and WWER-1000 reactors.

SFIF-2 is operated in compliance with the Rostekhnadzor's license. Change No.2 to the license validity terms and conditions (LVTC) of January 24, 2014 permitted trial operation of the startup complex SFIF-2 from January 1, 2013 to June 30, 2013.

As of December 15, 2013, 6 trains containing SNF from the Leningrad NPP were received and reloaded.

FSUE GKKhK completed the activities under the project "Reconstruction of DAV-90 shipment unit accompanied with development and manufacture of non-standardized equipment of FSUE GKKhK.

According to the Program for loading of irradiated DAV-90 units into TPC-135, the first batch of DAV-90 fuel elements was loaded into TPC-135 and shipped to FSUE PA Mayak.

The storage conditions for the spent DAV-90 meet the regulatory requirements.

***Nuclear fuel fabrication by fuel company JSC TVEL at JSC MSZ, JSC NZKhK and JSC "Chepetsky Mechanical Plant" (JSC ChMZ)***

No incidents that could affect assuring of radiation safety of personnel, population and the environment were registered at the nuclear fuel production plants in 2013 just as in the previous years. Radiation situation was monitored in accordance with the approved radiation monitoring plans. Radiation burden on personnel, levels of radioactive contamination of the equipment, territory, and dose rate in the adjacent territory didn't exceed the limits established by NRB-99/2009.

The action plan on elimination of the occurrences specified in the report and the statement of order based on results of the JSC NZKhK inspection performed by the Rostekhnadzor committee within September 11-20, 2012 was implemented according to the stated dates. Within 2012 and 2013, 10 out of 12 items of the order statement were completed. The general comprehensive examination program for nuclear facilities of JSC NZKhK was revised and submitted to JSC TVEL for approval.

In 2013 in the framework of implementation of the Rostekhnadzor's order statement, JSC NZKhK completed the activities on arrangement of an observation well network of the

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tailings storage facilities' subsoil state monitoring system. The network comprises 35 observation wells and 10 hydrological stations.

The existing nuclear and radiation safety system at JSC MSZ, JSC NZKhK and JSC ChMZ in the reporting period on the whole met the requirements of the applicable codes and regulations in the field of atomic energy use as well as Rostekhnadzor's license validity terms and conditions and is considered as satisfactory.

### ***Operation of commercial reactors***

In 2012, the LF-2 plant was commissioned at FSUE PA Mayak after the general overhaul. The monitoring systems demonstrated satisfactory performance in 2013. No comments regarding operation of the main equipment were given.

No cases of violations of the safe operation limits at the reactor plant "Ruslan" were registered in 2013 either.

No cases of violations of nuclear safety or radiation monitoring norms and conditions were registered at the reactor plants of FSUE PA Mayak in 2013.

The general condition of nuclear and radiation safety of the commercial reactors and plants of FSUE PA Mayak in 2013 may be assessed as satisfactory. Two ADE-4 and ADE-5 CUGRs at JSC SKhK and one ADE-2 CUGR at FSUE GKhK are being operated in the final shutdown mode and are being prepared for decommissioning.

Following the results of radiation monitoring conducted in 2013, the limits of the controlled parameters specified in NRB-99/2009 were not exceeded.

### ***Radio-chemical and chemical-metallurgical production facilities***

Operation of facilities and equipment of radiochemical plants (RChP), namely JSC SKhK, FSUE "The Mining and Chemical Combine" (FSUE GKhK), FSUE PA Mayak was carried out in accordance with the applicable regulatory and technical documentation. No comments were given regarding performance of facilities, equipment, monitoring devices and automation means. No deviations of the process parameters from the preset values were found in the reporting period.

The radiation burden on personnel of plants and external organizations received within the reporting period did not exceed the permissible values and were below the reference levels. The annual average values of the activity of aerosols in the air of the working areas as well as the annual average values of the surface radioactive contamination of the monitored surfaces did not exceed the specified reference levels. Actual values of radioactive releases did not exceed the established standards over the reporting period.

The existing nuclear and radiation safety system in the reporting period met the requirements of the applicable codes and regulations in the field of atomic energy use as well as the license validity terms and conditions and is assessed as satisfactory.

### ***Isotope separation production facilities***

In 2013, JSC PA "Electrochemical Plant" (JSC PA EKhZ) completed the activities related to reprocessing of highly enriched weapon-grade uranium (HEU) into low enriched uranium (LEU). The activities were conducted in compliance with Decree of the Russian Federation Government No. 861 of August 25, 1993.



No occurrences were recorded in the operation of systems and equipment important for safety at JSC PO EKhZ in 2013. The requirements established for nuclear and radiation safety and radiation monitoring were observed.

The existing nuclear and radiation safety system at JSC PO EKhZ in the reporting period on the whole met the requirements of the codes and regulations in the field of atomic energy use as well as license validity terms and conditions and is considered as satisfactory.

Over the reporting period radiation situation at the isotope separation sections (ISS) of JSC SHK was stable.

No accidents, radiation incidents and faulty actuations of emergency alarm systems were registered within the reporting period.

The annual average values of the volumetric activity of aerosols in the air of compartments' working areas did not exceed 0.3 of the permissible volumetric activity in 2013. No exceeding of the controlled intake of radionuclides into the plant employees' body was registered in 2013.

Summary values of alpha- and beta-active nuclides in the drain water supplied to industrial sewerage system were kept at lowest controllable levels, which make up no more than 50% of the reference levels. Monthly operational rates of radionuclide releases to the atmosphere were not exceeded.

No deviations of the process parameters from the preset values were identified in the reporting period; process equipment operated without any occurrences.

The existing nuclear and radiation safety system at ZRI JSC SKhK in the reporting period on the whole met the requirements of the codes and regulations in the field of atomic energy use as well as license validity terms and conditions and is considered as satisfactory.

No deviations from the preset operational modes were recorded at JSC AEKhK in the reporting period. No disturbances were recorded in the operation of systems and equipment important for safety in the plant's sections.

The annual radiation doses obtained by the personnel in 2013 remained at the level of 2012. The existing nuclear and radiation safety assurance system at ZRI JSC AEKhK in the reporting period mainly met the requirements of the codes and regulations in the field of atomic energy use and license validity terms and conditions and is assessed as satisfactory.

In the reporting period JSC UEKhK completed considerable amount of work with regard to upgrading the separation equipment; continued effort is made to change the equipment for safer items; the system of engineering and technical nuclear and radiation safety features is being improved.

Nevertheless, JSC UEKhK doesn't take any effective practical measures to solve the problem related to conversion of the uranium hexafluoride waste into triuranium octoxide; they continue its storing and accumulating in the outdoor site.

JSC International Uranium Enrichment Center (JSC IUEC) was created for the purpose of implementing the President of the Russian Federation initiative dated 25.01.06 "On creation of prototype global infrastructure, which would assure equal access for all interested parties to nuclear power subject to reliably following the non-proliferation regime" and providing

guaranteed access to separation capacities by way of offering enrichment services.

In 2013 JSC IUEC, for the purpose of creating a bank of low enriched uranium under the auspice of IAEA, stored nuclear materials (low enrichment uranium) in JSC AEKhK storage facilities in accordance with the storage agreement concluded between JSC IUEC and JSC AEKhK.

### *Sublimate production facilities*

Nuclear and radiation safety at the sublimate plant JSC SKhK is ensured in compliance with the requirements of codes and regulations in the field of atomic energy use.

No cases of overexposure of personnel above the reference level were registered in 2013.

The existing nuclear and radiation safety system in the reporting period on the whole met the requirements of federal codes and regulations and license validity terms and conditions.

Personnel exposure levels at the sublimate plant JSC AEKhK are considerably lower than the established rates.

A number of measures were implemented at the plant to enhance the safety level of the sublimate production.

The existing radiation safety system at the enterprise in the reporting period on the whole met the requirements of the codes and regulations in the field of atomic energy use and license validity terms and conditions.

### *Uranium mining production facilities*

JSC "Priargunskoye Mining-Chemical Production Association" (JSC PPGKhO) commissioned 8 new mining units in 2013. Acceptance of the new units and beds for operation is being implemented by the commission with participation of Rostekhnadzor's representatives accompanied with issuance of the acceptance reports. Mine No.8 operated earlier and laid up was prepared for operation by renewal of the surface complex of structures and driving of new mine tunnels from the side of Mine No.2 and was accepted for operation in December 2012.

No occurrences during operation of systems and components important to safety were registered within the reporting period.

Production radiation monitoring is maintained as per Schedule on Monitoring of Radiation and Harmful Process Factors for 2013.

Radiation situation demonstrated dynamic reduction of radiation burden on personnel. There were two causes for the dose burden reduction:

due to continuously increasing portion of high-performance mining equipment making it possible to reduce the miner-ore contact time;

due to reduction of the uranium content in the mined ores.

The reference level for the personal effective dose accumulated within five successive years (90 mSv) as well as for the annual effective dose (no more than 50 mSv) was not exceeded by any person.

The company developed the measures to improve the radiation situation: now fresh air is delivered by fan KTC-40 with the capacity being 40 thousand m<sup>3</sup>/h;

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The existing radiation safety system at JSC PPGKhO in the reporting period on the whole met the requirements of the codes and regulations in the field of atomic energy use as well as license validity terms and conditions and is considered as satisfactory.

Radiation monitoring in the specified control points is performed at the underground leaching area of JSC Khiagda; it includes the compartment of the sorption division, the chemical concentrate production compartment, the leaching solutions' production area, the industrial site territory (altogether 23 control points).

No radiation accidents, radiation incidents, non-radiation occurrences were registered in the reporting period at JSC Khiagda. The status of radiation safety in 2013 is considered as satisfactory.

Trial commercial operation of two local sorption installations and the main process building is being conducted at JSC Dalur. Uranium is mined by means of underground leaching at the Damlatovsky and Khokhlovsky uranium deposits.

No radiation accidents and consequences were registered at JSC Dalur within the reporting period.

The status of radiation safety was compliant with the requirements of codes and regulations in the field of atomic energy use.

### ***Enterprises being designed***

JSC "Elkonsky ore mining and smelting industrial combine" (Elkon GMK), JSC Uranium Mining Company "Gornoye" and JSC "Lunnoye" were not directly involved in management of nuclear materials, radioactive substances and radioactive waste in 2013.

In the reporting period JSC "Elkon GMK" was neither directly involved in treatment of NM, RS and RW nor involved contractors for such activities. The operations at deposits "Elkon", "Neprokhodimoye", "Druzhnoye" and "Severnoye" of the Elkonsky Ore Mining Area were stopped.

JSC Elkon GMK doesn't have any radiation hazardous facilities.

No operations related to RW management were performed within the reporting period; discharges and releases of radioactive substances into the environment were not made.

The inspections of the radiation safety statues were neither scheduled nor performed in the reporting period.

Prospecting mining and geological works at the deposit were completed at JSC Lunnoye in 2012. Construction and commissioning of the installation for production of the natural uranium concentrate is scheduled for 2014. Achieving of the design output of the natural uranium concentrate production is scheduled for 2015-2016.

No operations related to RW management were performed within the reporting period; discharges and releases of radioactive substances into the environment were not made.

The inspections of the radiation safety statues were neither scheduled nor performed in the reporting period.

### ***Radioactive waste management. Radioactive releases and discharges to the environment***

The activities related to management of radioactive waste of NFCFs are carried out in compliance with the licenses issued by Rostekhnadzor.

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In the process of fulfillment of the authorized activities JSC SKhK generates low-active, medium-active and high-active solid and liquid radwaste. A certain tendency towards reduction of the quantity of radwaste was observed over the reporting period.

As far as the solid radioactive wastes are being accumulated, they shall be sorted out based on their categories and transported to the RW storage facilities located at Site 16 of the Chemical and Metallurgical Plant.

Liquid radioactive wastes are pretreated and removed to disposal in geological formations at sites 18 and 18a.

Technological processes of liquid radioactive waste (LRW) pretreatment for disposal in geological formations comply with the regulations. The number of the LRW being generated meets the established standards.

No violations of radiation safety standards, which resulted in release of radioactive substances into the environment and high exposure of personnel were registered within the reporting period.

The existing system of radiation safety assurance during management of radioactive waste at JSC SKhK mainly complies with the requirements of the federal codes and regulations in the field of atomic energy use and license validity terms and conditions.

Liquid and solid radioactive wastes of various specific activity are being generated in the result of production activities carried out by the main divisions of FSUE "The Mining and Chemical Combine" (FSUE GKKhK).

Collection and sorting of radioactive waste should be carried out in their generation places. Processing, temporary storage and disposal of radioactive waste are arranged in a centralized manner at the facilities of Shop No.1 of the Isotope-Chemical Plant. Liquid radioactive wastes are removed to disposal at the "Severny" ground of the "Zheleznogorsky" Branch of FSUE "National operator for radwaste management".

Since the operating conditions in the main divisions of FSUE GKKhK (Reactor Factory and Radio-Chemical Plant) had changed, the number of LRW dropped into pool 366 and processed according to the cleaning scheme considerably decreased.

Based on the statement of FSUE GKKhK and the materials on substantiation of the standards for radioactive substances releases into the atmospheric air, the standards for maximum permissible RS releases into the atmospheric air were approved for FSUE GKKhK for the period of 1 year by Order No. 82-pr of May 17, 2013. According to the information of the Radioecological center of FSUE GKKhK, the values of the average monthly discharges and releases didn't exceed the reference values in the reporting period. The results of monitoring of the uranium content in the atmospheric discharges demonstrate that the activities of JSC Production Association "Electrochemical Plant" (JSC PA EKhZ) doesn't have any radiation impact on the environment and population above the established limits.

Low-activity and medium-activity radioactive wastes are generated at JSC "Novosibirsk Chemical Concentrates Plant" (JSC NZKhK) during implementation of the permitted activities.

The radionuclide-contaminated solutions generated as a result of the plant technological processes are subjected to reprocessing in Shop No.1. The process solutions after the liming process are transformed into solid uranium-containing

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limber deposits, which are transported as sludge by hydraulic transport to the tailings dam. The sludge line section (500 m) earlier decommissioned was liquidated in the reporting period. The sludge discharge place was transferred and the new sludge line was constructed up to the place of discharging into the tailings dam water-surface area.

9 observation wells are being operated at the tailings dam. A network of observation wells of the tailings storage facilities subsoil state monitoring system comprising 35 wells and 19 hydrological stations was additionally arranged.

According to the schedule of environmental facilities' monitoring for 2013, radiation situation monitoring of the tailings dam its sanitary protective area is being conducted. The monitoring results are to be presented in the reports.

Examination and repair of structures and equipment of the pump stations and sludge lines are conducted according to the schedule of planned and preventive activities.

JSC NZKhK obtained Rostekhnadzor's permit No. 7/2013 of June 24, 2013 for release of radioactive substances into the atmospheric air. The releases were within the established regulatory values in 2013.

The scrap metal contaminated with radionuclides after being decontamination was transferred to the SRW temporary storage site at the territory of the enterprise and then to LLC Ecomet-C for remelting. The old site for the contaminated scrap metal storage was liquidated in the reporting period.

JSC NZKhK does not discharge radioactive drains to the hydrographic grid.

Sublimate production solid radioactive waste are stored at JSC AEKhK in the RW storage facilities, sludge pits and trench storage facilities. To ensure safety and analytical monitoring of ground waters for uranium and fluorine ion content, observation wells were put into operation. The reference levels of the uranium and fluorine ion content in the ground waters were not exceeded in 2013.

In the framework of activities aimed at reduction of the radioactive waste volumes, it was envisaged to place flowing deposits of neutralized radioactive drains in the void spaces of structure 325/3. Activities were carried out in 2013 to repair the radioactive drain line, install the pressing plant and provide equipment to the unit for conditioning and sorting of solid radioactive waste.

Radioactive releases and discharges do not exceed the established levels. Discharge of process drains to the hydrographic grid was not effected in the first half of 2013.

No occurrences were registered in radwaste handling operations that might impair radiation safety.

The bulk of radioactive waste is generated at JSC "Priargunskoye Mining-Chemical Production Association" (JSC PPGKhO) as a result of hydrometallurgical processing of uranium ore. All uranium-series natural radionuclides are discharged into the tailings dam after removal of uranium.

Radioactive non-purifiable scrap metal constitutes other types of radioactive waste generated in the Association. The scrap metal of the underground uranium mines mostly remains in the underground mines.



Radioactive air emissions from the mines of the Uranium Mining and Ore Department contain radon and its fission products, as well as long-lived uranium-series radionuclides. They are removed without decontamination according to the design.

The value of the maximum permissible releases of radionuclides into the atmospheric air was established by Rostekhnadzor Permit No. 2/2012 of April 25, 2012 based on Order of the Siberia and the Far East ITD NRS No. 70-pr of April 24, 2012, validity period - till March 15, 2015. The value of the maximum permissible discharges of radionuclides was established by Permit of the Trans-Baikal Department of Rostekhnadzor No.3 based on Order of the Trans-Baikal Department of Rostekhnadzor No. 61 of February 8, 2010, validity period - till January 24, 2015.

Persistent problem is non-rehabilitated land in the valley Bambakai, into which uranium shaft spillway used to be discharged (located outside the control area). It covers the territory with the area of 418 thousand m<sup>2</sup> with the gamma dose rate being up to 2.0 mSv/h and the surface contamination of soil based on the sum of alpha-active isotopes being up to 3000 Bq/kg and based on the sum of beta-active isotopes being up to 1820 Bq/kg. The Federal Target Program on Nuclear and Radiation Safety for the period of 2008-2015 provides for allocation of funds for rehabilitation of the Bambakai valley.

Radioactive waste of JSC Khiagda comprise: contaminated earth and process equipment during decommissioning thereof. The contaminated earth is collected from the ground and washed in the weak acid solution. The decommissioned process equipment is to be decontaminated and placed at the radwaste temporary storage site. The process solutions containing radioactive substances should be recycled to the technological process. The process regulations for uranium mining by means of underground leaching don't suppose generation of any LRW at this stage of activities.

At JSC Dalur in the conditions of underground leaching, considering closed process cycle, generation of LRW is impossible.

No generation of solid radioactive waste was observed in the reporting period. The enterprise developed and prepared a system of collection, temporary storage and transportation of radioactive waste for disposal to a specialized organization.

Integrated activities on enhancement of safety during radioactive waste management were carried out at FSUE PA Mayak in 2013. Plans of reduction of liquid and solid radioactive waste, measures on enhancement of safety during radioactive waste management were developed and implemented in the structural units of FSUE PA Mayak. The established standards for radioactive waste generation and the reference levels for releases and discharges of radionuclides were not exceeded in 2013.

Instruction for the Enterprise No. V-04 of January 14, 2013 established the FSUE PA Mayak standards for discharge of water into the radioactive drain system by the structural units.

The volumes of LRW discharges into surface water basin - storage facility of LRW (special industrial water basin) V-6 and the activity of alpha- and beta-emitting radionuclides taken-in with the discharge water did not exceed the standards established for the enterprise.

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Operation of surface water basin - storage facility of LRW (special industrial water basin) V-6 was carried out in accordance with the instructions' requirements.

Construction and erection works related to construction of the purification plant building for the active drains and for the waters containing intermediate level waste generated in the result of chemical and metallurgical production works were carried out in the framework of the Federal Target Program "Nuclear and radiation safety assurance for 2008 and for the period up to 2015".

The personnel of Plant 22 carried out activities related to rehabilitation of contaminated territories, routine activities on inspection and repair of hydraulic engineering structures in the special water basins - storage facilities, they continued the activities related to mothballing of water basin V-9.

The activities related to monitoring of hydraulic engineering structures of water basins were carried out in the full scope in accordance with schedules. Commission examinations of hydraulic engineering structures were conducted twice a year (in the pre-flood and post-flood periods) followed by elaboration of an action plan on elimination of the found deficiencies.

The activities on measuring of water levels and water sampling in the observation wells of the hydrogeological network were carried out based on the program "Steady-state monitoring observations over the condition of the underground waters in the area of FSUE PA Mayak" in 2013 and were completed in the full scope and in accordance with the schedules. 2604 measurements of levels in the monitoring observation network wells were made and 314 samples were taken from the monitoring observation network wells within the reporting period.

Plant 22 developed and duly implemented the "Measures on improvement of the radiation situation state during RW management", No. 329/12 of July 6, 2012.

The following activities were carried out at Plant 235 in order to improve the state of radiation safety during management of radioactive waste:

experimental ground was created at the site of Plant 235 to reduce the volume of the generated solid radioactive waste by means of pressing, "Report on the pressing plant readiness for experimental operations" No. 2.2.235/1716 was issued on April 30, 2013. The activities were started as per "Program of performance of experimental operations at the pressing plant of building 802" No. 2.2.235/1715 of April 30, 2013; a Work Statement was developed for revision of the "V-9 (Karachai) water basin mothballing design. Phase 3". The main objectives of the design revision were to incorporate the SRW disposal site (V-9) into the design of the V-9 water basin mothballing and to extend the disposal site to all water area of the water basin closed part;

life cycle tests of the low level liquid waste purification plant were conducted from November 2012 to February 2013 at shop 4 of Plant 235. To improve the quality of the active drain water purification to remove radionuclides and mechanical impurities, "Plan of operation of the liquid LLW pilot commercial purification plant prototype" No. 2.2.235/1341 of March 19, 2013;

Instruction "On the standards of factory discharges into special industrial water basins for 2013" No. V-33dsp of February 14, 2013 was issued and "Measures on reduction of liquid RW discharges for 2013-2014" No. 2.2.235/823 of February 28, 2013 were developed in order to reduce the standard values for discharge of liquid radioactive waste into the surface water basins -storage facilities (special industrial water basins - storage facilities). As a result of implementation of these measures, discharges of LRW into water basin V-9 were reduced in 2013 by 5.03 % as compared to 2012.

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Special industrial water basins V-2, V-3, V-4, V-10, V-11, V-6, V-9, V-17 were operated in accordance with the instructions applicable at the enterprise. Operation of the JSC UEKhK nuclear installation results in generation of gaseous and solid radioactive waste.

Gaseous radioactive wastes constitute aerosols of alpha-active uranium radionuclides. In the course of gaseous radioactive waste treatment, the air removed from places of possible generation of gaseous radioactive waste as well as repair and maintenance operations sites was purified. The purification equipment, which reached the limit values of operating parameters, was replaced. The methods applied at the combine provide for continuous monitoring of the gas purification efficiency during management of gaseous radioactive waste. Electrical furnaces of the thermal liquidation plant in the machine revision shop and the combustion plant in shop 70 are equipped with the gas wet purification systems ensuring entrapment and purification of both gaseous radioactive waste and mechanical constituents of exhaust gases.

The standards for maximum permissible radionuclides' releases into the atmospheric air for JSC UEKhK were established by Order of the Rostekhnadzor Ural ITD NRS No. 01-09/44 of February 8, 2013. The permit for radionuclides' releases valid till February 1, 2014 was issued based on the established standard values. The actual releases at JSC UEKhK within 2013 didn't exceed the permissible values.

Solid radioactive wastes generated in the technological process of JSC UEKhK are reprocessed in Shop 70, at the same time they are conditioned (burned or pressed) at the solid waste reprocessing site.

No liquid radioactive waste is generated at JSC UEKhK.

All liquid and solid radioactive waste generated by LLC Novouralsk Scientific and Design Center (LLC NNKC) are transferred to Shop 70 of JSC UEKhK for reprocessing. The enterprise doesn't have its own discharges of radionuclides into the environment; all discharges are dumped into the sewerage of JSC UEKhK and monitored by the environmental protection laboratory of JSC UEKhK.

At JSC "Chepetsky Mechanical Plant" (JSC ChMZ), radwaste is generated in the structural units of the enterprise as a result of reprocessing of natural origin raw materials comprising only natural radionuclides. All the radwaste generated at the company is categorized as low-level waste.

The radwaste generated by the process cycle of the enterprise sections are transferred to the operating tailings storage facilities, while spent closed radionuclide sources - to RosRAO according to the requirements of regulatory documents.

Radwaste management at JSC ChMZ on the whole meets the requirements of the relevant codes and regulations.

In the course of research and development work at JSC GNTz NIIAR liquid and solid radioactive waste of different categories and radioactive gas aerosol releases are generated. Low and intermediate level LRW are transferred for disposal in the underground reservoir beds of the experimental industrial ground.

The measures on RW minimization were developed in the work packaged related to radioactive waste management. In the framework of the FTP "Nuclear and radiation safety assurance for 2008 and for the period up to 2015", activities are being carried out on modernization of RW and SF management system facilities.

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Collection, processing, temporary storage, transportation and disposal of radwaste on the whole meet the requirements of codes and regulations in the field of atomic energy use.

Radwaste management at JSC "Machine-Building Factory" (JSC MSZ) on the whole meets safety requirements and validity conditions of the Rostekhnadzor license.

Solid radwaste, spent radionuclide sources past their service life and organic LRW (oil) are collected and removed to FSUE Radon. Liquid radwaste undergoes treatment predominantly by liming and is then transferred to the plant's operating tailings storage.

Radioactive releases and discharges did not exceed the established regulatory values in 2013.

### ***Handling of radioactive material during transportation***

Transportation of radioactive materials in the Russian Federation is carried out by all kinds of transport – automobile, railway, water (sea) and air. Safety requirements are regulated by federal norms and regulations in the field of atomic energy "Safety regulations for transportation of radioactive materials" (NP-053-04). The activities involving nuclear material handling during transportation are carried out by 20 operating organizations (JSC GNTs NIAR, JSC SPb Isotope, JSC SKhK, JSC AEKhK, JSC EKHz, FSUE PO Mayak, JSC IRM, JSC UEKhK, JSC Concern Rosenergoatom, JSC VNIINM, FSUE NII NPO Luch, FSUE GNTs RF-PPI, FSE RRC Kurchatov Institute, JSC TVEL, JSC Atomspetstrans, JSC PPGKhO, JSC Khiagda, JSC Dalur, FSUE RFNC-VNIIEF) and 21 organizations carrying out activities and rendering services to the operating organizations (JSC ChMZ, LLC NPF Sosny, JSC ASPOL-BALTIC, JSC SMP, Corporation "Atlantic Ro-Ro Carriers", JSC ANSHIP, LLC ANROSKRIM, FSUE ATC CP, FSUE FTsYaRB, JSC UAT NZKhK, LLC NUKLON, JSC MSZ, JSC Kosmos, JSC Volga-Dnepr, JSC AviaconCitotrans, JSC NZKhK, Closed Joint Stock Company "WESTINGHOUSE ELECTRIC UK LIMITED", JSC RZhd, LLC ELEMASHPETSTRANS, LLC ELEMASH-AUTO). Operating organizations comprise practically all nuclear fuel cycle facilities and some research institutes. The organizations, which carry out activities and render services to the operators, comprise the incorporated enterprises of JSC TVEL (JSC MSZ, JSC NZKhK, JSC ChMZ), the organizations involved in reloading of nuclear material packages in the sea ports (stevedore company LLC ANROSKRYM), carrier-organizations - shipping, air, railway and automobile companies (JSC ASPOL-BALTIC, JSC SMP, Corporation "Atlantic Ro-Ro Carriers", JSC ANSHIP, JSC Kosmos, JSC Volga-Dnepr, JSC AviaconCitotrans, Closed Joint Stock Company "WESTINGHOUSE ELECTRIC U.K. LIMITED", JSC RZhd, LLC ELEMASHPETSTRANS, LLC ELEMASH-AUTO), as well as organizations involved in transport and forwarding servicing during transportation of nuclear material (LLC NPF Sosny, FSUE FCNRS, LLC NUCLON).



Nuclear materials are transported in transportation casks which are provided with certificates verifying compliance of the design and transportation conditions with the requirements of the above mentioned federal norms and regulations "Safety regulations for transportation of radioactive materials" (NP-053-04). In 2013, the Rostekhnadzor specialists reviewed and agreed 89 certificates including amendments and notifications of changes to certificates, as well as 3 special requirements for air transportation of nuclear materials and 1 change thereto.

The activity of returning to the Russian Federation of nuclear materials, which were previously exported for operation of nuclear research installations, was continued basing on the Agreement of 27th May 2004 between the Government of the Russian Federation and the Government of the United States on cooperation for importation to the Russian Federation of the nuclear fuel fabricated in the Russian Federation for research reactors. In 2013 irradiated fuel assemblies of research reactors were imported from Czechia, Vietnam and Hungary.

Also, importation of irradiated fuel assemblies from the NPPs of the Ukraine and the Republic of Bulgaria continued.

In 2013 pilot delivery of enriched uranium hexafluoride was made to South Korea via a new route, i.e. through the sea port Vostochny of the Promorsky Territory.

Rostekhnadzor when exercising the state control and supervision over the safety of nuclear material transportation is also licensing the activities on design, engineering and manufacture of transfer packing casks. The following companies and organizations have obtained the relevant licenses: JSC Leading Institute VNIPIET, JSC KBSM, JSC NZKhK, FSUE RFNC - VNIITF, FSUE RFNC-VNIIEF, JSC MSZ, JSC GNTs NIIAR, FSUE PA Sevmash, JSC Petrozavodskmash, JSC Nov-EnergoProm, JSC EKHz, JSC ICYaK, LLC NPF Sosny, JSC Uralkhimmash, JSC Energotex, JSC MK ORMETO-YuUMZ, LLC MSZ-Mekhanika, JSC NZKhK-Engineering, LLC SibMZ, JSC CAE MBK, LLC Electrolab, JSC Atommasheexport, LLC Variant 999.

The technical condition of transfer packing casks is of great importance for the safety of nuclear material transportation. The transfer packing casks available for transportation of irradiated fuel assemblies of VVER-440 and VVER-1000 nuclear power reactors were manufactured in 70-80-s of the previous century. Their operation has been presently extended according to the established procedure. Work was continued in 2013 in relation to designing of transfer packing casks meeting the state-of-the-art safety requirements for transportation of spent nuclear fuel of power reactors. The full scale sample of the transfer packing cask for VVER-1000 reactor spent nuclear fuel was tested for emergency conditions of transportation as per requirements of federal codes and regulations "Rules for safe transportation of radioactive materials" (NP-053-04). However, despite previous successful tests of the transfer packing casks' prototypes for transportation of spent nuclear fuel of VVER-type power reactors, they haven't been put into serial production to replace the existing obsolete stock of transfer packing casks.



In 2013 Rostekhnadzor agreed the statements of work for manufacture of the cast-iron TPC for storage and transportation of LLW, ILW and HLW.

***Specific measures that were taken in the reporting period by Operators and Rostekhnadzor (in the sphere of their competence) in order to improve the level of nuclear and radiation safety of nuclear fuel cycle facilities***

Within the reporting period work was continued at the supervised NFCFs to implement the action plans aimed at improvement of nuclear and radiation safety assurance systems.

***FSUE PO Mayak***

Reactor plant LF-2 was commissioned in 2013 after overhaul.

The following measures were taken to improve the NPP nuclear safety at Plant 20 within 2013:

- protective containers were replaced by the containers provided with the polyethylene protective layer;

- the statement of work and the design documentation were developed for replacement of the neutron-absorbing inserts with coaxial devices' paraffin filler by those with the polyethylene filler;

- introduction of the procedure "Plutonium. Procedure for mass measurements on D28U1 filters by means of gamma-ray spectrometry. Development of software";

- implementation (jointly with the central plant laboratory) of technical support of activities related to development of the procedure for uranium mass measurement in the equipment of shop 2 by radiometer MKS-AT1117;

- the software was developed, the staff was trained, the measurement instruction was elaborated.

Measures were taken to enhance the radiation safety and reduce the dose burden on the personnel of FSUE PA Mayak for 2013.

***FSUE GKKhK***

Two automated personnel monitoring systems APMS-301 completed with dose meters DVGN-01 for measurement of the individual equivalent dose rate in the mixed gamma-neutron fields were received at the enterprise in 2013. In August 2013, based on the document package review results and the measurements conducted the Enterprise's Radiation Safety Department was accredited by Rosstandart and Rosaccreditation for compliance with the requirements for independence and technical competence during personnel monitoring established by the documents of the radiation monitoring laboratories' Accreditation System. The area of accreditation: "Radiation measurements of facilities: Personnel" (Accreditation Certificate: dated August 2, 2013 No. POCC RU.0001.21PK34).

***JSC PA EKZhZ***

Annual inspections of the state of nuclear safety and implementation of requirements of the Nuclear Safety Rules for nuclear fuel cycle facilities

(NP-063-05) as well as implementation of requirements of the shops' (departments') instructions on nuclear safety were conducted in the shops and departments of JSC PA EKhZ. The separation production nuclear safety team of JSC PA EKhZ conducted inspections to check elimination of the drawbacks found by the committee. The drawbacks found during inspections were eliminated (statements of work were developed, instructions were revised, new documentation on nuclear safety was elaborated).

### ***JSC PPGKhO***

In the reporting period the Radiation Safety Service received dose meters "Arbiter", spectroscan, x-ray analyzer, automated personnel monitoring system.

Reduction of personnel radiation exposure doses is achieved by reducing the time for execution of well face operations by means of usage of higher-capacity and remote equipment. Loading and delivery machines PD-2E were equipped with protective lead screens against gamma-radiation, which enables reducing the dose of the personnel operating therein by 3.5-5 times. Machines MPDN were replaced by machines PD-2E and imported ones Mikroskoop and Toro, where the miner is spaced from the ore and protected by the machine itself.

Enhancement of safety during operations with sealed radionuclide sources is accomplished mostly by means of reduction of the number and activity of the applied sources. This is accomplished by replacement of radioisotope level meters, other radioisotope devices, radionuclide sources applied for monitoring of sensitivity and alignment of radiometric and radiation measurement equipment ranges with the alternative devices operating based on the other physical principles, as well as low radiotoxicity, specific and total activity volume sources. Thus, industrial radio-wave level meters and domestic level meters based on the principle of the environment electroconductivity change are no used instead of BGI-type level meters based on high activity emitters made of caesium 137.

Retrofitting of ventilation was made in shop No.1 of the hydrometallurgical plant. A set of similar activities was performed in shop No.2 during preceding years, which enabled reduction of the radioactive aerosols' air contamination by tens of times.

### ***JSC SKhK***

Activities related to mothballing of the pool as per the design started in 2011 were performed in the territory of pool B-1. The activities were completed on mothballing of pool B-2.

Since the HEU-LEU program was completed in June 2013, according to the Instruction No. 1-1/306-R of September 16, 2013 the facility "The area for reprocessing of highly enriched uranium oxides of Shop No.53 of the Sublimate Plant" at the JSC SKhK site is being transferred to the shutdown mode with subsequent decommissioning.

### ***JSC UEKhK***

The activities related to modernization of separation equipment with changeover to new generation centrifugal separators and AKSU equipment were carried out in 2013 as during previous years.

### ***JSC NZKhK***

The enterprise carried out the following activities in the reporting period in order to enhance safety:

- the sludge line section (500 m) earlier decommissioned was liquidated in the tailings storage. The sludge discharge place was transferred and the new sludge line was constructed up to the place of discharging into the tailings dam water-surface area;

- a network of observation wells of the tailings storage facilities subsoil state monitoring system comprising 35 wells and 19 hydrological stations was arranged;

- the uranium dioxide powder production chain based on the ADU technology was stopped in building 17;

- the storage facilities for nuclear fission materials were equipped in building 336V. All nuclear fission materials were moved to the "production center" from the territory of warehouses "Prototypes";

- the investment project on modernization of production capacities of the fuel pellets' production area was at the stage of implementation.

### ***NFCF Nuclear and Radiation Safety Challenges and Their Resolution Status***

The critical tasks related to NFCFs safety assurance comprise the necessity to provide for the adequate financing and performance of activities at various stages of preparation for decommissioning and decommissioning of commercial uranium-graphite reactors at the sites of FSUE PA Mayak, FSUE GKKhK and JSC SKhK including conducting of all necessary engineering and radiation examinations and preparation of necessary design materials.

The most critical problems comprise aging of buildings and structures at a number of sectoral companies, which were commissioned in the mid 40s - early 50s of the last century. Insufficient financing available for their repairs, reconstruction and decommissioning can eventually negatively affect nuclear and radiation safety in operation of nuclear facilities and management of nuclear materials and radioactive substances.

It should be also emphasized that a large amount of morally and physically obsolete equipment, which is past its service life or is close to the end of service life, is still operated.

The problem of monitoring and ensuring of safety during long-term storage of uranium hexafluoride waste (UHFw) at open sites of nuclear fuel cycle facilities is still pressing now.

Other deficiencies and critical problems of nuclear and radiation safety of nuclear fuel cycle facilities are:

- continued ingress of liquid radioactive substances into the open industrial water basins/ponds at FSUE SKhK, FSUE GKKhK, and FSUE PO Mayak;

- interim storage of irradiated fuel assemblies DAV-90 without reprocessing thereof at FSUE PA

Mayak, JSC SKhK and FSUE GKKhK;

- continued long-term storage of spent nuclear fuel of AMB type in the storage facilities of FSUE PO Mayak without fuel reprocessing (at the present time design work is underway to resolve this problem);

to this date not all nuclear fuel cycle facilities (NFCF) collect, store and condition radioactive waste in full compliance with the requirements of regulatory documents.

At present, introduction of the state-of-the-art technologies of radwaste reprocessing and storage is insufficient. The companies don't have solid radioactive waste disposal facilities fully complying with the state-of-the-art requirements. A large number of solid radioactive waste storage facilities closed down more than 20 years ago is located at the territory of the enterprises; the design documents for some of these facilities are missing. A number of outdoor surface storage facilities for low radioactive waste (pools, sludge storages, tailings storages, etc.) are being operated up to now.

Construction of the near-surface storage facility for low- and intermediate-level SRW of plant 235 of FSUE PA Mayak (building No.133) was suspended due to insufficient financing.

The policy of the State Corporation Rosatom towards reduction of the number of personnel at the supervised nuclear fuel cycle facilities implemented also by means of separation of structural units into the separate enterprises carried out in the framework of nuclear power industrial complex restructuring gives rise to a certain concern. Such processes result in decrease of the production controllability as it would make difficulties to monitor the activities of the separate enterprises being established (including monitoring by the operating organization) and ensure safety of the activities executed by them. It is necessary to tighten the requirements for the organizations carrying out activities and rendering services for nuclear fuel cycle facilities including arrangement of incorporation of these organizations' employees positions (managers, deputy managers responsible for safety aspects, responsible managers for activities at nuclear- and (or) radiation-hazardous areas) into the list of positions of nuclear facilities' employees who should receive permits of Rostekhnadzor for the right of execution of activities in the field of atomic energy use approved by Decree of the Government of the Russian Federation No. 240 of March 3, 1997. Besides, the fact that the existing system of tendering processes and public purchases has extended the time periods for receipt of financial budgetary funds, delivery of the necessary equipment and execution of activities at capital construction objects of nuclear fuel cycle facilities also requires consideration.

The following problems are still pending:

- lack of the Administrative Regulations on Rostekhnadzor's providing of governmental services for establishing of the limits of maximum permissible radioactive releases and discharges into the environment, issuing of permits for discharges and releases (is now under registration in the Ministry of Justice of Russia);

- techniques for development of limits of radioactive substances' maximum permissible releases into water objects for water consumers was not approved (is at the stage of agreement).

- other critical problems in the field of nuclear and radiation safety assurance at nuclear fuel cycle facilities comprise the following.

To ensure radiation safety of NFCF personnel and public, targeted budgetary financing is needed to resolve the problems related to reprocessing and disposal of the radioactive waste accumulated over many years of operation of these

enterprises. The primary concerns are construction of radwaste vitrification plants, construction of LRW cementation systems, as well as development of medium and low-level radioactive waste reprocessing facilities.

Rehabilitation of the territories contaminated with radioactive substances due to accidents and historic activities of some enterprises, and also due to incomplete decommissioning activities, is still a standing issue. A number of measures aimed at rehabilitation of territories included into the Federal Target Program on nuclear and radiation safety for the period within 2008-2015 were not performed in 2012 due to lack of financing, e.g. rehabilitation of the Bambakai valley lands contaminated in the result of preceding activities of JSC PPGKhO.

Problems of the NRCs nuclear and radiation safety regulation.

1. Reduction in the number of inspections related to legislative limitations observed in the recent years may result in slackening of control over the state of nuclear and radiation safety at supervised facilities. Excessive complexity and multi-stage process of agreement upon inspections conducted by the supervisory body at the enterprises unjustifiably reduce their efficiency as well as degrade the effectiveness of arrangement of the safety supervision in the field of atomic energy use. It would be advisable to revise the presently used format of the Report on Inspection of Supervised Enterprises and Organizations in terms of nuclear supervision to ensure that it provides a more complete and adequate description of all found deficiencies and violations affecting (both directly and indirectly) assurance of safety in atomic energy use.

2. Owing to revision of Federal Law No. 69-FZ "On fire safety", the federal state supervision at the facilities supervised by FSUE GKhK was removed from the competence of the EMERCOM of Russia. Rostekhnadzor faces a complicated task of elaborating regulatory documents, training of inspectors and specialists and arranging of fire safety supervision at the underground facilities of FSUE GKhK.

3. Lack of the centralized system for training, refresher training and professional development of inspectors in the aspects pertaining to safety assurance supervision in this field makes considerable difficulties in providing Rostekhnadzor with the adequately qualified inspector staff; the issue related to arrangement of the centralized refresher training courses for inspectors on technical safety and civil construction supervision is still pending.

4. The scope of information provided to various higher organizations has considerably increased. It could result in substitution of actual supervisory activities by statistical ones. The structure and the scope of the reporting statistical information submitted by the ITD NRS should be revised in order to optimize it with the account taken on the actual use of this information in future.

The following measures have been envisaged, executed and proposed to enhance the efficiency of the ITD NRS supervision:

extension of procedures and techniques on training, feedback of work experience for the heads of the departments and inspectors in Rostekhnadzor on the whole (this activity is currently implemented as periodical brief meetings among the inspection department heads and managers of the ITD NRS held by the relevant branch department of the headquarters as well as in the form of workshops for senior inspectors and managers of the ITD NRS arranged by FBE SEC NRS of



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Rostekhnadzor);

improvement of the practice of applying preventive measures aimed at prevention of violations of the requirements of federal codes and regulations in the supervised organizations;

increase of inspectors' exactingness in relation to the operating organizations as well as management and officials of organizations during execution of requirements for assurance of safety of nuclear facilities.

5. The problems related to providing the headquarters and the ITD NRS with the highly qualified staff become more pressing now since highly qualified specialists leave due to their dissatisfaction with the amount of their salary and a lack of a number of social guarantees. The supervised organizations could constitute one of the sources for staffing with new employees; however the level of salaries at these companies is significantly higher than the salary of the employees working within the Rostekhnadzor's system. Lack of accommodation and preschool institutions is also a problem, which makes it difficult to engage young specialists to the state civil service.

### 2.2.3 Nuclear research installations

In 2013 Rostekhnadzor performed regulation and supervision of nuclear and radiation safety of 66 nuclear research installations (NRI) in 17 operating organizations of various ministries and departments. Data on activities at nuclear research installations as per activity types is given in Table 15.

**Table 15**

**Data as per activity types**

Type of a nuclear research installation	Type of activity		
	Operation (including the number of those operated in final shutdown mode)	Decommissioning	Construction
Research reactors	23 (1)	5	2
Critical assemblies	26	0	0
Subcritical assemblies	9	0	1
Number of research reactors	58	5	3
<b>Total number:</b>	<b>66</b>		

During the reporting period Rostekhnadzor Headquarters issued 13 licenses to operating organizations. Relevant data is given in Table 16 (hereinafter, data as of 2012 is provided).

**Table 16**

**Licenses issued by Rostekhnadzor Headquarters**

Type of activity	Number of licenses
Siting	0 (0)
NRI design and engineering	2 (2)
NRI construction	1 (0)
NRI operation	5 (4)
NRI decommissioning	1 (0)

Type of activity	Number of licenses
NM and RW management	0 (0)
Use of NMs during R&D	2 (1)
Operation of NM and spent fuel storage facilities at NRI site	1 (2)
Decommissioning of NM storage facilities	0 (0)
Operation of a stationary structure with NMs (protective chambers)	0 (1)
Conduct of an expert review	1 (1)
<b>Total:</b>	<b>13 (11)</b>

The interregional territorial departments for nuclear and radiation safety supervision granted 31 licenses for activities at nuclear research installations.

Rostechnadzor issued permits granting the right to work in the field of atomic energy to the employees (personnel) of nuclear research installations.

In the reporting period permits were issued

by the Headquarters to (11) 15 top managers of nuclear research installations;

by NRS ITD to 112 (69) employees of nuclear research installations.

Inspection activity

In the reporting period NRS ITD held 140 (104) inspections to check the status of nuclear, radiation and technical safety of nuclear research installations.

149 (201) violations of the requirements of the federal codes and standards in the field of atomic energy were revealed during the inspections.

The total sum of administrative fines imposed by the ITDs made up 825 (293) thousand rubles.

In the second half of 2013 Rostechnadzor Headquarters in cooperation with NRS ITDs arranged and conducted inspections of the Unified Institute of Nuclear Research (Dubna). As a result of inspections, 11 violations of the requirements of federal codes and standards in the field of atomic energy were revealed, a statement of order on their elimination was issued, and a penalty was imposed in the total amount of 20 thousand rubles.

The results of NRI inspections held by ITDs in 2012 are presented in Table 17.

**Table 17****Results of the ITD NRS inspection activities at NRIs in 2013**

Criterion	NRS ITD					Total
	VITD	NEITD	UITD	CITD	ITD Siberia	
Total number of inspections	39 (23)	25 (20)	17 (11)	52 (31)	7 (5)	140 (90)
Number of violations revealed	29 (4)	11 (7)	6 (6)	75 (48)	28 (4)	149 (69)
Total number of administrative penalties imposed as a result of the inspections	3 (0)	1 (1)	0 (0)	6 (4)	1 (0)	11 (5)
The sum of penalties imposed (thousand rubles)	65 (0)	20 (20)	0 (0)	710 (660)	30 (0)	825 (680)

**Operational occurrences at nuclear research installations**

In the reporting period no nuclear, radiation accidents occurred at the supervised NRIs.

In 2013 6 (7) operational occurrences were registered at nuclear research installations classified according to the Regulations for the procedure of investigation and accounting of operational occurrences at nuclear research installations (NP-027-10). No violations of normal operations limits and conditions were observed.

Distribution of NRI operational occurrences by NRS ITDs and RF constituent entities is presented in Table 18.

**Table 18****Distribution of NRI operational occurrences against NRS ITDs and RF constituent entities**

NRS ITD	RF constituent entities	2013 (2012)	
		Number of occurrences	Total number in NRS ITD
CITD	Moscow	0 (0)	3 (3)
	Moscow region	1 (3)	
	Kaluga region	2 (0)	
NEITD	Saint-Petersburg	0 (0)	1 (0)
	Leningrad region	1 (0)	
VITD	Ulyanovsk region	2 (2)	2 (2)
	Nizhniy Novgorod region	0 (0)	
UITD	Sverdlovsk Region	0 (1)	0 (1)
Siberia and Far East	Tomsk	0 (1)	0 (1)
	<b>Total:</b>	<b>6 (7)</b>	<b>6 (7)</b>

Distribution of NRI operational occurrences by operating organizations and categories (in accordance with NP-027-10) is presented in Table 19.

**Table 19**

**Distribution of NRI operational occurrences by operating organizations and categories (in accordance with NP-027-10)**

Operating organization	NRI	Occurrence category					Total
		P01	P02	P03	P08	P09	
Branch of FSUE NIFKhI named after L.Ya. Karpov	VVR-ts	1		1			2
FSBE Petersburg Nuclear Physics Institute	VVR-m		1				1
JSC GNTs NIAR	SM-3					1	1
JSC GNTs NIAR	BOR-60				1		1
International Intergovernmental Organization JINR	IBR-2				1		1
<b>Total number for the year:</b>		<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>6</b>

Occurrences of category P08 deal with malfunctions of the control and protection system, interlocks at the values of NRI monitored parameters not exceeding the specified limits.

In 2013 there were two operational occurrences at VVR-ts NRI of the FSUE NIFKhI named after L.Ya.Karpov:

1. On March 27, 2013, a spent fuel assembly was damaged due to careless actions of the personnel of VVER-ts shift. Shift personnel failed to assure high quality of activities during the transfer of the spent fuel assembly from spent fuel pond transportation container to the transportation container of the distribution chamber. In particular, there was no adequate control of the location of the spent fuel assembly, which caused the damage.

2. On April 22, 2013, due to the absence of a formal work permit, which is a violation of the Instruction on radiation safety (IRB-2011), two persons were irradiated at VVER-ts within the limits of the permissible annual exposure dose specified by regulatory documents. The main cause of the occurrence dealt with deficiencies in personnel training.

The main causes of the occurrences are connected with lack of proper control of technical discipline, timely implementation of plans related to the elimination of violations of federal codes and standards in the field of atomic energy use and license validity terms and conditions, that shall be exercised by the management of the branch of FSUE NIFKhI named after L.Ya.Karpov.

Administrative measures were applied for the branch of FSUE NIFKhI named after L.Ya.Karpov and some of its officials, in accordance with the legislation, namely: a penalty in the amount of 600 thousand rubles was imposed onto the legal entity, two penalties in the amount of 30 thousand rubles were imposed on officials. The total sum of the penalties made up 660 thousand rubles.

All operational occurrences at the NRI were properly investigated, and appropriate corrective measures were developed and implemented in order to prevent recurrence of similar events. Rostekhnadzor Headquarters considered reports on the occurrences and forwarded them to the SEC NRS for a thorough analysis.

The above-mentioned occurrences do not exceed the limits and conditions of NRI safety, but impact NRI operation stability and cause lay-over of the NRI experimental facilities.

Inspections of the procedure of investigation and accounting of NRI operational occurrences applied by the operating organization, held by NRS ITDs, confirmed the



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fulfillment of procedural requirements established in NP-027–10.

### ***Radioactive releases and discharges***

No radioactive substances were released or discharged to the environment at the Rostekhnadzor supervised NRIs in quantities exceeding the established values, and radiation situation did not exceed natural background.

### ***Radiation burden on the station and external employees (personnel)***

No cases of occupational overexposure were observed during operational occurrences.

Radiation burden on the permanent and temporary personnel was below the limits of control levels established at the enterprises.

### ***Decommissioning of NRIs and NM storage facilities***

Decommissioning of NRIs and NM and spent fuel storage facilities, located at the territory of the operating organization, is supervised.

The following 5 NRIs are at the stage of decommissioning: research reactors VR (FSUE LSC RF-ITEF), AM (FSUE LSC RF-FEI), AST-1 and RBT 10/1 (JSC LSC NIIAR), MR (SRC KI);

Spent nuclear fuel storage facility located at the territory of FSUE NIIP is decommissioned.

### ***Nuclear fuel and radioactive waste management***

Management of fresh and spent nuclear fuel, radioactive waste and sources of ionizing radiation in operating organizations satisfies the requirements of norms and regulations in the field of atomic energy in general.

One of the safety assurance problems is the problem of spent nuclear fuel and radioactive waste removal from the territory of operating organization and their subsequent disposal. The primary concern is the high cost of services charged for that kind of work by specialized facilities.

### ***Analysis of the operating organizations' activity***

Operating organizations carry out activities related to technical re-equipment, assurance of NRI safe operation. According to the license conditions the work is conducted to analyze safety status of NRI complexes for compliance with the requirements of new enacted regulatory documents in the field of atomic energy, and measures on the fulfillment of the requirements and (or) compensating measures for existing deviations are developed. Nuclear safety commissions of operating organizations hold annual internal inspections of NRI safety state. Operating organizations submit annual reports on NRI safety to Rostekhnadzor which are further analyzed by the SEC NRS. Analysis results are provided to Rostekhnadzor Headquarters.

### ***General Assessment of Nuclear and Radiation Safety of NRI***

The status of nuclear, radiation and technical safety at NRIs is characterized as satisfactory on the whole on the basis of NRI licensing process, outcome of completed inspections of NRI safety, and follow up on the implementation of license conditions. The system of regulatory documents on NRI safety meets the current IAEA requirements on the whole, and NRI inspection programs are consistent with international practices.

#### 2.2.4. Marine Nuclear Installations and Life Support Facilities

##### *General features of marine nuclear installations*

In 2013 Rostekhnadzor exercised state regulation of nuclear and radiation safety of nuclear-powered vessels and supporting facilities, as well as of organizations that fulfill the work and deliver services in the field of atomic energy use.

In the reporting period supervised organizations received 12 licenses (11 licenses in 2012).

Under the state supervision were 10 nuclear-powered vessels and 5 nuclear support vessels (hereinafter referred to as NS vessels) of FSUE "Atomflot" with the State Atomic Energy Corporation "Rosatom." Technical condition of the nuclear fleet and service ships as per January 31, 2013, is provided in Tables 20–21.

**Table 20**

##### *Technical condition of nuclear ships*

Name of ship	Design	Year when it was constructed	Type of nuclear steam generating installation	Number of reactors	Technical condition
Nuclear icebreaker "Lenin"	92-M	1959	OK-900	2	Decommissioned. Cores unloaded. Moored near the sea port of Murmansk, works as a museum of icebreaker fleet
Nuclear icebreaker "Arktika"	1052-1	1975	OK-900A	2	Activities on bringing it into the final shutdown mode. Cores unloaded.
Nuclear icebreaker "Sibir"	1052-2	1977	OK-900A	2	Final shutdown. Cores unloaded.
Nuclear icebreaker	10521-1	1985	OK-900A	2	In operation
Nuclear icebreaker	10521-2	1989	OK-900A	2	In operation reserve. Cores unloaded.
Nuclear icebreaker	10521-3	1992	OK-900A	2	In operation
Nuclear icebreaker	10580-1	1989	KLT-40M	1	In operation
Nuclear icebreaker	10580-2	1990	KLT-40M	1	In operation
Nuclear icebreaker Sevmorput	10081	1988	KLT-40	1	In operation reserve. Core unloaded.
Nuclear icebreaker	10521-4	2007	OK-900A	2	In operation

**Table 21**

##### *Technical condition of nuclear serviceships*

Name of ship	Designation of ship	Technical condition
Floating technical base (FTB) Imandra	Storage of fresh and spent nuclear fuel (SNF)	In operation
FTB Lotta	SNF storage	In operation
FTB Lepse	SNF and RW storage	Was transferred to shipyard Nerpa, a branch of JSC Shipyard Center Zvezdochka Preparation for SNF unloading and decommissioning of the
Steamer Volodarkiy	Interim SRW storage	Under decommissioning in the branch of FSUE RosRAO, North Western Center SevRAO
Special tanker Serebryanka	Transportation of SNF in containers, temporary storage of LRW	In operation

FSUE “Atomflot” operates and also provides for basing of nuclear-powered and nuclear support vessels, repairs of nuclear power equipment, storage and processing of radioactive waste (radwaste), transportation/loading and technological operations with nuclear fuel.

The status of nuclear and radiation safety at FSUE “Atomflot” meets the requirements of the federal norms and regulations in the field of atomic energy.

State supervision covered shipbuilding and shipyards JSC Baltijskiy Zavod, LLC Baltzavod-Sudostroyeniye, JSC Shipbuilding Plant Amurskiy and its branch, ship equipment plant Vostok, JSC DVZ Zvezda and other facilities working and rendering services in the field of use of atomic energy. There were totally 23 organizations working in the field of use of atomic energy under supervision.

JSC DVS Zvezda operated floating plant on LRW processing (PZO-500) and temporary RW storage.

At LLC Baltzavod-Sudostroyeniye there are works on construction of the main floating power unit of a nuclear power plant of low capacity with reactors of KLT-40S type and the head nuclear icebreaker of 22220 design with reactor installations RITM-200. In the year 2013 at the said facilities there were no nuclear and radiation hazardous works.

The level of nuclear and radiation safety assurance at the ship-building sector enterprises meets the requirements of federal norms and regulations in the field of atomic energy.

State supervision covered complexes of stands - prototypes of marine nuclear installations in the State Scientific Center of the Russian Federation - Physical and Energy Institute after A.I. Leipunskiy (FSUE SSC RF PhEI). Technical condition of the stands-prototypes as per December 31, 2013, is given in Table 22.

**Table 22**

***Technical condition of stands-prototypes***

Name	Operating organization	Technical condition
27/VM	PhEI	Decommissioning
27/VT	PhEI	Decommissioning

No violations of federal norms and regulations in the field of atomic energy were found during operation of bench prototypes.

### ***Conduct of inspections***

Over the reporting period there were 95 inspections (66 in 2012). 33 violations were found and had to be eliminated as per prescriptions (34 in 2012).

Prescriptions were issued upon the revealed violations and (or) prescriptions for their elimination; there were hearings of the heads of structural divisions of the supervised organizations. Fines were not applied. There were no prescriptions not fulfilled within the specified terms.

Generally, the causes of the revealed violations were lack of discipline and negligence of the personnel when performing their duties, poor control by the management.

### ***Operational occurrences***

No accidents or emergencies occurred in 2013 and 2012 at the supervised nuclear facilities.

9 operational occurrences were registered at nuclear ships of FSUE Atomflot of the State Corporation Rosatom (in 2012

10) as per classification of the Provisions on the Procedure of Classification, Investigation and Informing on Occurrences at Nuclear Fleet Facilities (RD 31.20.42–93).

The causes of the accidents:

leaks in steam generators — 5;

failure of equipment — 4.

Leak in the piping system of steam generators (including one before the piping system service life expires) is still the most frequent operational occurrence during operation of nuclear fleet.

The major cause of failure of the piping systems of steam generators are not identified in the full scope. The search for the causes of cracks in the piping systems of steam generators is performed with the help of material testing organizations.

The registered operational occurrences didn't result in exceeding of safe operational limits and were removed as per requirements of operating instructions. The radiation situation during all occurrences remained within the normal state limits.

### ***Dose burden***

Radiation safety assurance and organization of radiation control in the supervised organizations are arranged in accordance with the requirements of regulatory documents. No cases of occupational overexposure were recorded in the reporting period. Radiation burden on the permanent and temporary personnel was below the limits of control levels. Safety of personnel and public in terms of exposure to radiation factors was assured.

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### ***Decommissioning***

Ship Volodarskiy is under decommissioning now. It was previously used as a temporary storage for SRW.

In the reporting period nuclear power installations on ships were not decommissioned.

### ***RW and ionizing radiation sources management***

RW and ionizing radiations sources management was performed in compliance with the requirements of regulatory documents as per established technological scheme and in line with the radiation safety measures.

No unauthorized releases or discharges of radioactive waste were revealed. No radioactive contamination was recorded at the facilities or adjacent territories. The level of preparedness of supervised organizations and their relevant structural divisions makes it possible to assure efficient performance of measures aimed at elimination of radiation accidents and consequences thereof.

### ***Analysis of activities performed by operating organizations and related to improvement of safety assurance at nuclear power installations on ships***

Designers of nuclear ships and nuclear power installations (JSC TsKB Aisberg, JSC OKBM Afrikantov, JSC Concern NPO Avrora, and RRC Kurchatov Institute) analyzed compliance with the federal codes and regulations "General Safety Provisions for Marine Nuclear Power Installations" (NP-022-2000), "Nuclear Safety Rules for Marine Nuclear Power Installation" (NP-029-01) at nuclear ships. Proposals on work procedure for implementation of the said federal codes and regulations were developed and approved in cooperation with Rostekhnadzor.

Based on the analysis and proposals by the designers, the operating organization developed decisions for each nuclear ship regarding measures on enhancing of safety assurance of the reactor installations. The decisions stated those responsible for their implementation and the terms for implementation of the planned measures:

- at nuclear icebreakers Vaigach and Taimyr activities on enhancement of safety assurance level were performed in the full scope;

- at nuclear icebreaker Rossiya (it is supposed that its operation will stop in early 2014) there are activities on enhancement of safety assurance level of reactor installations in the cooldown system;

- at nuclear icebreaker Yamal there are activities on extension its service life and measures on enhancing safety assurance level of systems and equipment of the reactor installations:

  - at the high pressure gas system;

  - at the system of the 3rd circuit of primary circuit circulation pump cooling; at the cooldown system.

  - Rostekhnadzor controls implementation of the mentioned decisions.



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### ***Status of nuclear and radiation safety assurance***

The status of nuclear and radiation safety in the supervised organizations meets the requirements of the federal norms and regulations in the field of atomic energy.

The subject of special attention of Rostekhnadzor is SNF storage at FTB Lepse. Due to long term storage, a part of the nuclear fuel on FTB Lepse is classified as defected or in emergency condition.

A plan on decommissioning of Lepse was developed within the framework of international cooperation on the project of comprehensive decommissioning of FTB Lepse. FSUE

Atomflot developed and approved the decommissioning program for FTB Lepse. Currently the ship is being prepared for decommissioning, so it has been transported to the place where those works will take place - to shipyard Nerpa which is a branch of JSC Shipyard Center Zvezdochka. The works will start when Rostekhnadzor issues all the required permits (licenses).

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### 2.2.5 Radiation Hazardous Facilities

#### ***General description of radiation hazardous facilities***

The following radiation hazardous facilities are under the state supervision:

- a) medical, scientific, research laboratories and other facilities, where activities with open radionuclide sources (ORnS) are carried out;
- b) complexes, installations, devices, equipment and items with sealed radionuclide sources (SRnS) including:
  - technological and medical irradiating installations; flaw detectors;
  - radioisotope instruments and other sources; RITEG (radioisotopic thermoelectrical generator);
- c) radioactive substances storage facilities including:
  - specialized storage facilities located mainly in the sections of FSUE "RosRAO" affiliated offices;
  - non-specialized storage facilities located at nuclear facilities;
- d) radioactive waste storage facilities including:
  - specialized storage facilities of FSUE "RosRAO" sections; non-specialized storage facilities located at nuclear facilities;
  - storage facilities containing radionuclide waste of natural origin.

According to the data of ITD NRS reports, the categories of radiation facilities of supervised organisations are subdivided as per potential radiation hazard categories adopted in OSPORB-99/2010 as follows:

- a) organizations operating category I radiation facilities located only on the territories of the Central ITD NRS (totally 6 organizations):

GNTs RF "Institute for Physics and Power Engineering named after A. Leipunsky (complexes of radioactive substances production, non-specialised storage of radwaste), Obninsk, Kaluga region; Obninsk branch of GNTs RF FSUE NIFKhI after L. Karpov (complexes of radioactive substances production, complexes of powerful isotope irradiation installations, non-specialised storage facility for radwaste), Obninsk, Kaluga region; FSE RNTs "Kurchatov Institute" (complexes of powerful isotope irradiation installations, non-specialised storage facilities for radioactive substances and radwaste), Moscow;

FSUE "Research and development instrumentation Institute" (complex of powerful isotope irradiation facilities, non-specialized storage facility of radwaste), Lytkarino, Moscow region;

Electro-chemical plant FSUE "RFYaTs - VNIIEF" Sarov, closed administrative-territorial entity;

International inter-governmental organisation "Unified Institute of nuclear research", Dubna, Moscow region;

- b) organisations operating category II radiation facilities located on the territories supervised by all ITD NRS. 16 organisations were recognised as the above ones, mainly FSUE "RosRAO" branches and their sections;

- c) nearly 1,750 organizations operate categories III and IV facilities, number of these facilities amounts to 3,450.

Activities with open and/or sealed radionuclide sources are carried out at open and/or sealed radionuclide stationary sources.

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Radiation sources containing open radionuclide sources from the minimal activity level up to  $1.0 \times 10^{14}$  Bq, include the following:

radioactive substances with a gross activity corresponding to classes I, II and III as per OSPORB-99/2010 (P-32, S-35, C-14, Ra-226, Zr-95 and other);

sets of chemical agents for radioimmunological microanalysis and radiopharmaceuticals used in medical institutions.

Radioactive sources containing sealed radionuclide sources with activity from  $1 \times 10^1$  up to  $4 \times 10^{17}$  Bq include the following:

high power irradiating process gamma-ray installations of the of the following types: RB-1200, K-20000 (60000, 120000, 200000), "Sterilizer", "Researcher", MRX-g-100 (20, 25M), "Tweezers", "Panorama", "Tulip", GOT, IGUR-1, GP-2, GUPZhMP-1, and others with fixed and movable exciter and with different number of used sealed sources based on Co-60 radionuclide with a total activity of up to  $3.0 \times 10^{15}$  Bq;

different modifications of radiation-therapeutic medical plants of "Ray-1", "Agate-R" (S, V, VU, VT, V3, V5, Rocus-M (AM), Teratron Elite 80, Multisours YDR, TERAGAM K-01 type with different number of used sealed sources based on Co-60 radionuclide with total activity of up to  $5.4 \times 10^{14}$  Bq; portable gamma flaw detectors "Gammarid", RID and "Stapel-5M" with sources GIID-3 (4,5,6), scanners, (flaw detectors) of CBS LBD type base on Ir-192, Co-60, Cs-137 and Tl-170 with sources activity of up to  $2.0 \times 10^{13}$  Bq;

radioisotope instruments with isotope sources Pu-238-Be-9, Am-241-Be-9, Co-60, Cs-137, Pu-238, Am-241 (these are process control instruments, including monitoring gamma level indicators, density indicators, flow meters, thickness gage, static electricity eliminators, icing alarms, borehole tools and detectors of radiation-monitoring equipment with built-in sources). Isotopes activity in inducted instruments sources amounts to from  $1 \cdot 10^1$  up to  $3.7 \cdot 10^1$  Bq;

RITEG containing radionuclide thermal sources with Sr-90 radionuclide. As of late 2013, 1,864 organisations were under ITD NRS supervision, out of them 1,597 had valid licenses. Distribution of supervised organisation vise ITD NRS is presented in Table 23.

**Table 23**

***Distribution of supervised organisation vise ITD NRS***

<b><i>Number of organizations under supervision</i></b>						
<b><i>Central ITD NRS</i></b>	<b><i>North-European ITD NRS</i></b>	<b><i>Don ITD NRS</i></b>	<b><i>Volga ITD NRS</i></b>	<b><i>Ural ITD NRS</i></b>	<b><i>ITD NRS of Siberia and Far East</i></b>	<b><i>Total</i></b>
518	230	174	295	232	415	1,864

Table 24 contains the distribution of valid (as of the end of 2013) licenses in % of the total licenses amount vise kinds of activities they were issued for.

About half of supervised organizations are industrial enterprises and companies of fuel and energy sector according to their activity nature, about 15% - research and development (R&D) organisations, 20% - medical entities,, the rest of them are organisations carrying out activities and rendering services for operating organisations and organisations, that refer to the field of education, transport and agriculture, Ministry of Defence.

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Table 24

*Breakdown of licenses valid as of the end of 2013*

<i>Kind of activity</i>								
<i>Design of radiation sources (RS), storage facilities (SF) and</i>	<i>Construction of RS, SF</i>	<i>Manufacture of RS</i>	<i>Engineering and manufacture of equipment for RS and</i>	<i>Operation of RS and SF (including commissioning and decommissioning, and regarding supply of RS, RnS (radionuclide sources), maintenance</i>	<i>Management of radioactive substances (radioactive waste)</i>	<i>Management of radioactive substances in the course of</i>	<i>Use of radioactive substances (radioactive waste) during research</i>	<i>Safety review</i>
2 %	3.1 %	—	2 %	75.3 %	7.9 %	2.8 %	6.1 %	0.9 %

The total number of supervised organizations also includes 49 regional and departmental information and analytic centers (RIATs, VIATs) belonging to the system of state control and accounting of radioactive substances and radwaste.

About 70% of supervised organisations have departmental belonging: State corporation Rosatom, Ministry of Defense, Ministry of healthcare, Ministry of the Russian Federation for Civil Defense, Emergency Management and Natural Disasters Response, Customs service, Ministry of Education, etc.

Allocation of radiation hazardous facilities, including storage facilities, among ITD NRS in 2013 is given in Table 25 .

Table 25

*Allocation of radiation hazardous facilities, including storage facilities, among ITD NRS in 2013*

<i>Quantity</i>	<i>ITD NRS</i>						
	<i>Central ITD NRS</i>	<i>North-European ITD NRS</i>	<i>Don ITD NRS</i>	<i>Volga ITD NRS</i>	<i>Ural ITD NRS</i>	<i>ITD NRS of Siberia and Far East</i>	<i>Total</i>
Stationary radiation sources	1,001	575	264	624	304	710	3,478
Storage facilities	205	168	90	227	177	169	1,036

In 2013 129 organisations ceased activity in the field of atomic energy use. Organizations' going out of supervision is mainly related to the refusal to carry out activity for various reasons, in particular, due to the absence of material resources to perform works with the use of RS, or due to transition to other principles of technological processes control, or due to cumbersome permissible procedure.

Breakdown of organisation that ceased the activity in the field of atomic energy use is given in Table 26 .

Table 26

*Breakdown of organisation that ceased the activity in the field of atomic energy use*

<i>ITD NRS</i>						
<i>Central ITD NRS</i>	<i>North-European ITD NRS</i>	<i>Don ITD NRS</i>	<i>Volga ITD NRS</i>	<i>Ural ITD NRS</i>	<i>ITD NRS of Siberia and Far East</i>	<i>Total</i>
39	12	13	22	20	23	129

Categorization of radionuclide sources against potential radiation hazards is on the way in the Russian Federation in accordance with the requirements of Federal codes and regulations NP-038-2011.

As part of all radiation sources, 76,777 sealed radionuclide sources of category I-V (as per potential radiation hazards) are operated by supervised organizations. Distribution of sealed radionuclide sources against categories and ITD NRS are in Table 27.

Table 27

*Distribution of sealed radionuclide sources against categories and ITD NRS*

<i>Quantity</i>	<i>ITD NRS</i>						<i>Total</i>
	<i>Central ITD NRS</i>	<i>North-European ITD</i>	<i>Don ITD NRS</i>	<i>Volga ITD NRS</i>	<i>Ural ITD NRS</i>	<i>ITD NRS of Siberia and Far East</i>	
Total amount of sealed radionuclide sources,	18,566	12,973	3,866	8,472	4,260	28,640	76,777
Sealed radionuclide	1,743	941	31	516	27	240	3,498
Sealed radionuclide	552	984	121	129	169	114	2,069
Sealed radionuclide	1,012	634	141	754	623	1,127	4,291
Sealed radionuclide	3,385	1,843	736	1,145	1,916	2,471	11,496
Sealed radionuclide	11,874	8,571	2,837	5,928	1,525	24,688	55,423

Total amount of sealed radionuclide sources subject to licensing amounts to 10,000 pcs.

Total amount of sealed radionuclide sources of category 4 and 5, that are not subject to licensing, are more than 66,000 pcs.

The following organisations on the territory of the Russian Federation have got the most potentially hazardous radiation facilities:

organizations operating powerful irradiating process installations. Basic types of these installations are as follows: RB-1200, K-20000 (60000, 120000, 200000), "Sterilizer", "Researcher", MRX-g-100 (20, 25M), "Tweezers", "Panorama", "Tulip", GOT, IGUR-1, GP-2, GUPZhMP-1;

metrological dispensaries of the Ministry of Healthcare and Social Development of the Russian Federation operating radiation therapeutic medical installations of various modification, for example, like «Agate» ( P, P1, S, V, VU, VT, V3, V5), «Rokus» (M, MU), «Selektron» etc.;



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organisations applying non-destructive techniques in technological processes (gamma flaw detectors "Gammarid" 25, 170/400, 192/120, "Stapel 5M", RID-21);

organizations carrying out filed geophysical research with the use of radionuclide sources;

organizations and their subdivisions which have unattended radioisotope devices, including RITEG incorporating radionuclide heat sources with Sr-90 radionuclide. Each radionuclide heat source activity is from  $4.81 \times 10^{14}$  Bq up to  $4.55 \times 10^{15}$  Bq (depending on RITEG type), and RITEG can include from 1 to 6 radionuclide heat sources.

Apart from above mentioned radiation facilities, facilities of oil producing organizations, at which open storage is provided for the oil-field equipment with salt depositions of natural radionuclides RA-226, RA-228, U-238, TH-232 and K-40 (e.g. LLC Lukoil Nizhnevolzhskneft, JSC Rosneft-Stavropolneftegas, etc.) are also potentially hazardous. The safety status at radiation hazardous facilities is generally assessed as satisfactory.

### *Supervisory activity*

1,609 inspections of radiation hazardous facilities were conducted in 2013, including 694 schedules and 915 unscheduled inspections.

Radiation safety inspectors possess previous experience in supervising compliance with radiation safety requirements to facilities. Professional level of inspectors is mainly improved through self-studies as part of technical training system, and also by arranging workshops devoted to studying legal acts of the Russian Federation, regulatory documents on radiation safety, orders and resolutions of Rostekhnadzor. Table 28 includes data on the number of radiation hazardous facilities inspections vise each ITD.

**Table 28**

***Data on the number of radiation hazardous facilities inspections conducted by ITD NRS in 2013***

<i>Number of inspections</i>	<i>ITD NRS</i>					
	<i>Central ITD NRS</i>	<i>North-European ITD NRS</i>	<i>Don ITD NRS</i>	<i>Volga ITD NRS</i>	<i>Ural ITD NRS</i>	<i>ITD NRS of Siberia and Far East</i>
Scheduled	234	72	56	18	55	259
Unscheduled	96	57	319	284	53	106
<b>Total:</b>	<b>330</b>	<b>129</b>	<b>375</b>	<b>302</b>	<b>108</b>	<b>365</b>

Conduct of non-scheduled inspections was also conditioned by the following: follow-up to check the execution of statement of orders issued on results of previous inspections;

execution of specific orders (directions) of the Rostekhnadzor Chairman and his deputies, as well as the management of the ITD NRS;

other grounds established by the legislation of the Russian Federation. In 2013 inspectors found 860 violations in the course of radiation hazardous facilities inspections.

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Principal contributors to violations are:

violations related to keeping general documentation on radiation safety assurance and its conformity to regulatory requirements;

violations connected with radiation accident preparedness and elimination of accident effects;

lack of scheduled training and testing of the personnel knowledge.

To ensure follow-up of the supervised organizations' implementation of measures related to radiation safety assurance, the inspections divisions exercise preventive and routine inspection to check:

implementation of measures on meeting the radiation safety requirements by of supervised organizations officials;

supervised organizations officials' observance of dead line of submitting information on implementation of license validity conditions and elimination of violations found in the course of inspection activities.

Issuance of statements of order for elimination of violations in supervised organizations activities still remains a basic disciplinary action applied to the violators. Such an action was applied in cases when deficiencies were of an organizational nature and didn't generally affect assurance of radiation safety.

Besides, ITDs NRS used such form of interconnection with the state executive authorities, as providing them with the results of analysis of supervisory activities on ensuring radiation safety, as well as with the annual reports of the supervised organizations to enable timely response to the found violations and deviations of the organizations' observance of codes and standards in the field of atomic energy use.

Based on inspection results, the inspecting staff exercised the powers granted by the legislation of the Russian Federation for imposing administrative sanctions upon guilty persons for violations of the law in the field of atomic energy use.

Totally 43 administrative penalties were imposed in 2013 based on conducted inspections results. Out of them, 5 warning were given, 38 fines were imposed (26 upon officials, 12 upon legal entities). Total sum of imposed administrative fines amounted to 1,786 thousand roubles (560 thousand roubles - upon officials; 1,226 thousand roubles - upon legal entities).

### ***Occurrences in radiation hazardous facilities operation***

In 2013, 44 occurrences in operation of radiation hazardous facilities were observed (33 occurrences - in 2012). Distribution of occurrences against ITDs NRS are given in Table 29.

**Table 29**

***Distribution of occurrences against ITDs NRS in 2013***

<b><i>Index</i></b>	<b><i>ITD NRS</i></b>					
	<b><i>Central ITD NRS</i></b>	<b><i>North-European ITD NRS</i></b>	<b><i>Don ITD NRS</i></b>	<b><i>Volga ITD NRS</i></b>	<b><i>Ural ITD NRS</i></b>	<b><i>ITD NRS of Siberia and Far East</i></b>
Number of registered occurrences	1	4	1	6	21	11
P-1	1	—	—	1	—	—
P-2	—	4	1	5	21	11

Almost all occurrences were classified as P-2.

Main part of incidents is related to freezes-in and breakages of the logging devices during geophysical work containing radionuclide radiation sources.

Most of P-2 occurrences (non-radiation incidents) were registered in the ITD NRS of Siberia and Far East, Ural ITD NRS. It is caused by the fact, that a lot of occurrences in ionising radiation sources management were registered at mining industry enterprises, which were concentrated on the territory of above mentioned ITD NRS. Activities in inspecting the investigation of operational occurrences at radiation hazardous facilities meet the requirements of the "Rules for Investigation and Accounting for Violations in Management of Radiation Sources and Radioactive Substances Applied in National Economy" (NP-014-2000).

The following was not registered within the reporting period:

overriding of the basic radiation dose limits for personnel and population was recorded; inadmissible releases and discharges of radioactive substances, environmental contamination;

unauthorized intrusion into the territory of radiation hazardous facilities or unauthorized access to radioactive sources, radioactive substances or radioactive waste.

P-1 occurrences happened on the territories supervised by the Central and Volga ITD NRS.

1. Radioactive contamination was detected in the premise of FGBU "RNMRiK" of Minzdrav of Russia (9, Borisoglebsky per., Moscow, TsAO, Arbat region) on May 23, 2013. Ra-226 discharge took place out of a generator (open radionuclide source based on Ra-226 salt solution with activity of 1.1 GBq) into the mixing tank of the plant for radon concentrate preparation. The premise with area of 12 m<sup>2</sup> is located on the first floor of the building. Contamination was registered with long living alpha-active radionuclides on the areas of 50 cm<sup>2</sup>, there was not a release of radioactive substances beyond the storage boundary. Personnel irradiation and environmental radioactive contamination was not registered.

2. As it was found out, a dosimetrist received a dose of 10.14 mSv vise 9 mSv control level (while handling radwaste), in the course of handling activities by the Samara branch "Privolzhsky territorial district" of the FSUE "Radwaste management enterprise RosRAO" on the territory of the Kursk NPP. Administrative offense case was tried in respect to an official - chief specialist of the Samara division of "Privolzhsky territorial district", branch of FSUE RosRAO". An order was issued on imposing administrative penalty in the form of a fine of 20,000 roubles.

Analysis of occurrences in radiation hazardous facilities within 2009-2013 shows, that there was neither drastic reduction, nor considerable increase in occurrences amount.

### ***Management of radioactive waste and spent sources of ionising radiation***

Collection, transport, conditioning and storage of radwaste are implemented by FSUE "Radwaste management enterprise "RosRAO" and by FSUE "Joint Environmental Technological Scientific Research Center for Radioactive Waste Decontamination and Environmental Protection (FSUE "RADON").

As per potential radiation hazards, indicated storage facilities are classified as category II and III, which means (in case of an accident) the confinement of

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radiation impact within the facility territory (category III) or by control area (category II).

Waste coming for storage is mainly presented by spent ionizing radiation sources, radioisotope instruments, contaminated earth, laboratory glassware, construction garbage, contaminated working clothes and footwear.

Primarily radioactive waste is located in near-surface structures of various types: concrete tanks (for radwaste of low and medium activity level), well type storages (for spent ionizing radiation sources), trench type storages and tanks for liquid radioactive waste.

Radioactive waste storage safety is assured by the use of physical barriers system on the path of ionizing radiation and radioactive substances propagation into environment, including matrix materials, inner packaging, containers, system storage engineering barriers, geological structure of wall rock, as well as by the system of organizational and technical measures barriers protection and effectiveness maintaining.

Radwaste reprocessing is done by the Leningrad division of FSUE "RosRAO" branch "North-West territorial district" and FSUE RADON.

Radwaste preliminary processing and reprocessing include sorting, deinstallation, fragmenting, decontamination, compacting, cementing, joint grouting, bituminization, incineration of solid and liquid radioactive waste, purification of liquid radioactive waste. Reprocessing is done with the use of technologies excluding the ingress of radioactive substances into environment.

The analysis of the status and efficiency of the facilities demonstrates their reliability and sufficient safety for personnel and environment, which is confirmed by radiation monitoring results. Optimal scope of radiation monitoring is established at enterprises' sites and control area, it is necessary for obtaining adequate information on radiation impact levels, state of radiation situation and environmental contamination, which include measurement and determination of the following parameters:

- gamma-radiation dose rate;
- beta-particles flux density;
- neutron radiation dose rate;
- radwaste gamma and neutron radiation dose rate;
- contamination with alpha- and beta-active substances of production premises surfaces, transport means, roads territories;
- contamination with alpha- and beta-active substances of individual protection means, personnel skin, personal clothing;
- individual dose of personnel outer exposure;
- nuclide composition of radioactive substances in atmospheric deposition, soil and ground, vegetation.

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In 2013 Rostechnadzor granted licenses to the Federal state unitary enterprise "National operator for radwaste management" (FSUE "NO RAO").

Disposal of LRW is implemented by the following branches: Zheleznogorsky FSUE "NO RAO", Dimitrovgradsky FSUE "NO RAO" and Seversky FSUE "NO RAO".

Data on radwaste accumulated and surrendered by operating organizations are given in Table 30.

**Table 30**

**Data on radwaste accumulated and surrendered by operating organizations**

<i>Management</i>	<i>Amount of waste originated in an organisation</i>						<i>Amount of waste surrendered by organisations for reprocessing and disposal</i>					
	<i>SRW</i>		<i>LRW</i>		<i>Spent SRnS</i>		<i>SRW</i>		<i>LRW</i>		<i>Spent SRnS</i>	
	<i>As per activity, Bq</i>	<i>As per volume, m<sup>3</sup></i>	<i>As per activity, Bq</i>	<i>As per volume, m<sup>3</sup></i>	<i>As per activity, Bq</i>	<i>As per amount, pcs</i>	<i>As per activity, Bq</i>	<i>As per volume, m<sup>3</sup></i>	<i>As per activity, Bq</i>	<i>As per volume, m<sup>3</sup></i>	<i>As per activity, Bq</i>	<i>As per amount, pcs</i>
CITD	1.44 x 10 <sup>14</sup>	1,510.5 <sub>2</sub>	2.8x10 <sup>13</sup>	801.51 <sub>7</sub>	1.90 x 10 <sup>15</sup>	4,077	1.20 x 10 <sup>14</sup>	1,228.1	2.79 x 10 <sup>13</sup>	801	1.02 x 10 <sup>15</sup>	1,315
NEITD	2.06 x 10 <sup>13</sup>	819.1	2.0 x 10 <sup>12</sup>	179.011	2.14 x 10 <sup>14</sup>	822	1.13 x 10 <sup>13</sup>	1,304.5	6.02 x 10 <sup>14</sup>	758	3.35 x 10 <sup>14</sup>	10,282.
DITD	1.32 x 10 <sup>9</sup>	157.368	—	—	1.37 x 10 <sup>15</sup>	982	2.47 x 10 <sup>7</sup>	0.37	—	—	1.37 x 10 <sup>15</sup>	521
VITD	7.54 x 10 <sup>11</sup>	2,512.8 <sub>8</sub>	—	6.1 x 10 <sup>4</sup>	8.0 x 10 <sup>15</sup>	1412	—	6.3 x 10 <sup>4</sup>	—	6.1 x 10 <sup>4</sup>	8.08 x 10 <sup>15</sup>	491
UITD	2.06 x 10 <sup>11</sup>	287.51 <sub>2</sub>	3.97 x 10 <sup>5</sup>	3.8	7.42 x 10 <sup>15</sup>	4,89 <sub>9</sub>	2.06 x 10 <sup>11</sup>	287.46	—	—	7.42 x 10 <sup>15</sup>	4,899
ITD of Siberia and Far East	9.83 x 10 <sup>12</sup>	1,945.9	—	18.0 10.4	1.31 x 10 <sup>16</sup>	3,310	1.78 x 10 <sup>10</sup>	0.20	—	18.0 x 10 <sup>4</sup>	4.37 x 10 <sup>14</sup>	698
<b>Total:</b>	1.66 x 10 <sup>14</sup>	7,233.28	3.0 x 10 <sup>13</sup>	24.2 x 10 <sup>4</sup>	3.20 x 10 <sup>16</sup>	15,502	1.32 x 10 <sup>14</sup>	2,820.7	6.30 x 10 <sup>14</sup>	24.3 x 10 <sup>4</sup>	1.83 x 10 <sup>16</sup>	18,206

Apart from specified kinds of activities the enterprises carry out:

radioactive waste management in radiation accident works related to detection and liquidation of radioactive contamination;

management of radwaste, radioactive substances and ionizing radiation sources in transportation;

management of radwaste, radioactive substances and ionizing radiation sources in the course of radiation monitoring and determination of radwaste radionuclide composition;

works on individual dosimetry monitoring; works on decontamination of clothing,

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protection means, process equipment, transportation casks, specialised vehicles; monitoring of radiation situation in the area of possible contamination, control area, radiation control area with the help of engineering means of continuous on-line control; performing works within the state system of radioactive waste and substances control and accounting in the Russian Federation.

### ***Radiation hazardous facilities (RHF) safety assurance***

Assurance of radiation safety within the reporting period meets the requirements of the Federal codes and regulations.

The existing systems and components ensuring radiation safety (systems for transportation and fastening of sealed radionuclide sources, radiation sources control, signalization and radiation accident alert, interlocks, physical barriers, power, heat, water and gas supply systems, ventilation and fire safety systems) mainly comply with the design and regulatory requirements and are in good working state.

Maintenance and replacement of equipment with expired service life in metrological dispensaries were conducted by specialized organizations holding relevant licenses.

In most organizations, the operation of radioactive sources and management of radioactive substances and radwaste meets the requirements of regulatory documents in the field of atomic energy use.

The bulk of the violations that were not remedied on time are mainly related to insufficient finances available with the organizations for construction and installation, removal of radioactive sources from service, procurement of radiation equipment, replacement of overage sealed radionuclide sources and transfer for long-term storage (disposal) of radioactive waste, maintenance and technical examination of equipment and systems ensuring radiation safety.

That is primarily typical for state-financed organizations under federal control, state-financed organizations of the constituent entities of the Russian Federation, as well as some joint stock companies.

Radiation monitoring (RM) in supervised organizations was carried out taking into account the radiation hazardous facilities category in terms of potential radiation hazards and class of activity by regular radiation monitoring services or nominated responsible persons, and sometimes by other organizations licensed by Rostekhnadzor for that kind of services.

Main parameters controlled during operation of radioactive sources in organizations are:

- gamma-radiation dose rate;

- level of radioactive contamination of working surfaces, equipment, transport, personnel clothes and skin.

Besides, control of sealed radionuclide sources tightness and control of radioactive gases and aerosols in the air of working and other premises of organisations' premises was exercised.

The radiation burden on group A personnel (flaw detection people, dosimetrists, deactivation specialists, special vehicles drivers, radiologists, specialists for recharging) did not change, according to annual reports of supervised organizations

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within the reporting period the burden did not exceed dose reference limit levels established by NRB-99/2010.

Reference levels established for the controlled parameters of radiation factors were not exceeded. Radionuclide discharges and releases in the environment did not exceed the permitted values.

Qualification of personnel operating radiation sources and supervising radiation safety is adequate for ensuring safety in the field of atomic energy use.

The measures aimed at improvement of RHF physical protection included the measures of administrative nature (documents development and review) and engineering nature (improvement of security alarm system, protection barriers, security forces, etc.).

The status of physical protection in the supervised organizations ensures security of radioactive sources, radioactive substances and radwaste. Radiation sources are stored in specially allotted and furnished premises equipped with the alarm system, which is controlled from the security console. Organizations make analysis of the existing physical protection systems for their compliance with the requirements of the Federal codes and regulations, and measures are taken to clear the deficiencies and faults found by during inspections.

The level of preparedness for elimination of radiation accidents and their consequences is determined by the availability of potential accidents list during the licensed activity and their anticipated consequences, availability of sufficient and adequate engineering means and emergency procedures for emergency drills, skills acquired by personnel in the course of the drills.

All organizations developed action plans for personnel protection, emergency response instructions for personnel, envisaged emergency stock, whose volume was defined in consultation with the Federal Supervision Service for Consumer Rights Protection and People Welfare. These documents define accident situations (fragments of initiating events) and personnel actions in case of emergency. Analysis of inspection activity in the reporting period showed, that the main factors adversely affecting the status of radiation safety of radiation hazardous facilities were as follows:

- wear-out of machinery and equipment used in activities with radioactive substances and radioactive waste;

- need to decommission high-power radioisotope installations with exhausted resource and replacement of spent sealed radionuclide sources of operating radioisotope installations;

- occasional insufficient quality performance of the organizations that deliver services to operating organizations;

- persistent disposal problem of depleted uranium items;

- the problem of accumulation and unjustifiably long storage in organizations of the sources that are past their assigned service life mainly due to limited financial capabilities of the organizations;

- replacement/extension of assigned service life of metrological sealed radionuclide sources of in military units.

Level of radiation safety assurance in supervised organizations meets the requirements of codes and regulations in the field of atomic energy use.

Based on the performed analysis of occurrences, one may make a general

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assessment of the safety status at radiation facilities based on the absence of accidents and radiation incidents and non-exceeding of radiation burden on the personnel of supervised organizations and population above the established norms. The safety status at the supervised organizations during operation of radiation sources and use of radioactive substances may be assessed as satisfactory.

#### *2.2.6. State system of nuclear materials, radioactive substances and waste control and accounting*

##### ***2.2.6.1. State system of nuclear materials control and accounting (NMCA)***

The following Federal regulatory documents are used in the field of NMCA:

Federal Law No. 170-FZ of November 21, 1995 "On the Use of Atomic Energy";

Federal Law No. 102-FZ of June 26, 2008 "On assurance of measurements uniformity";

Federal Law No.294-FZ of December 26, 2008, "On protection of rights of legal persons and individual entrepreneurs in exercising state control (supervision) and municipal control";

Administrative regulation for execution by the Federal Environmental, Industrial and Nuclear Supervision Service of the state function of state control and supervision over physical protection of nuclear installations, radiation sources, storage facilities, nuclear materials and radioactive substances, the unified state control and accounting system for nuclear material, radioactive substances and radioactive waste approve by order No.703 dated December 15, 2011, of the Federal Environmental, Industrial and Nuclear Supervision Service.

Provisions on the state system of nuclear material control and accounting enacted by the Resolution of the Government of the Russian Federation No. 352 of 06.05.2008.

Basic rules for NMCA (NP-030-12) approved by Rostekhnadzor order No.255 of 17.04.2012.

Regulations for transfer of nuclear materials into the category of radioactive waste (NP-072-13) approved by Rostekhnadzor order No.288 of 05.07.2013.

Requirements for arrangement of material balance areas (NP-081-07) approved by Rostekhnadzor Directive No.2 dated November 19, 2007.

Also used are organizational and administrative documents of operating organizations level, that manage nuclear materials.

In the framework of supervision of the state nuclear materials accounting and control system Rostekhnadzor exercises supervision over 50 organizations, where 295 nuclear materials balance areas (MBA) are arranged. Out of them, there are 81 MBAs of nuclear materials category 1 (most potentially dangerous) in 22 organisations, 11 MBAs of category 2 - in 3 organisations, 15 MBAs of category 3 - in 2 organisations, 188 MBAs of category 4 - in 23 organisations.

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### *Conduct of inspections of nuclear material control and accounting, found violations of regulatory documents requirements*

181 inspections of nuclear materials control and accounting state were conducted in 2013 (163 inspections in 2012). Out of them, 10% (16 inspections) were conducted with application of technical facilities (inspection measurements by non-destructive testing in checking nuclear materials availability).

166 violations of federal norms and regulations and 9 violations of license conditions were revealed based on results of inspections. 5 administrative fines were imposed in the total amount of 470 thousand rubles.

The regime of continuous surveillance was established in 46 organisations out of 50 ones inspected in the frame of state supervision over the state system of NMCA.

Inspections of NMCA were conducted in 7 organisations in 2013: at the Bilibino NPP, JSC EDO Gidropress, JSC "Hi-tech research and development Institute of non-organic materials after A.Bochvara A. (VNIINM), branch of the research and development physical-chemical Institute after L.Karpov, awarded Order of the Red Banner of Labour (NIFKhI), Central research and development Institute after academician A.Krylov, JSC OKBM after Africantov, JSC Lunnoye, JSC "Elkonsky ore mining and smelting industrial combine".

Inspections in first 5 organisations out of those indicated were not conducted due to insufficient staffing of respective inspection divisions of Rostekhnadzor territorial bodies, and in the last 2 organization - due to actual absence of activities of nuclear materials managements within the reporting period in these 2 organisations.

Inspections of nuclear materials control and accounting state in all indicated organisations will be conducted in 2014.

Most inspections in 2013 (50) were conducted in the Ural Interregional Territorial Department (ITD) of nuclear and radiation safety (NRS). Fewest inspections (8) were conducted in the North-European ITD NRS (NEITD). In 2013 the number of violations found in NMCA increased as compared with 2012 (175 - in 2013, 97 - in 2012).

Principle causes of the found violations are as follows:

- enactment of a new revision of Basic Rules for Nuclear Material Accounting and Control (NP-030-12), establishing more detailed requirements to NMCA system as compared with a previous revision;

- insufficient measures for NMCA system improvement at some enterprises;

- enhancement of efficiency supervision over requirements for NMCA, including that by inspecting staff proficiency improvement.

Fewest number of violations were found at the Kalinin NPP, Kola NPP, Beloyarsk NPP, Smolensk NPP, Novovoronezh NPP, Leningrad NPP, Kursk NPP, Balakovo NPP, Rostov NPP.

Violations at NPP amounts to 6% of overall found violations in NMCA. On the average, one violation per each NPP. In 2013 the inspections of NMCA were conducted with high intensity, on the average 6 inspections at each NPP per year (31% of all inspections of NMCA state).

Small number of revealed violations in NMCA state may be explained by the fact, that nuclear materials are used at NPP in the form of inventory items (fuel assemblies). In this connection, the system of NMCA is relatively simple as compared, for example, with nuclear fuel cycle facilities (NFCF). Besides, positive

factor is a good arrangement and coordination of works in the field of NMCA at JSC Concern Rosenergoatom.

The amount of violations is 9% of all found violations (3 violations per each enterprise) at NFCFs, involved in fuel fabrication for NPP (JSC NZKhK, JSC MSZ, JCS ChMZ). On the average 6 inspections (10% of all NMCA inspections) were conducted at each enterprise, where MNCA issues were examined.

27% of all violations were found at chemical combines, uniting several stages of fuel cycle (FSUE PO Mayak, JSC SKhK, FSUE GKKhK), on the average 16 violations per enterprise. On the whole 13 inspections were conducted at each of the enterprises (22% of all inspections of NMCA).

Indicated enterprises are the most complex for arrangement of NMCA system. Therefore, they face a lot of NMCA inspections.

In 2013 the number of violations at the plants of isotopes separation (JSC AEKhK, JSC PO EKZhZ, JSC UEKhK and MTsOU) amounted to 4% of the overall amount of violations, with 4% of conducted inspections (on the average 3 inspections at each enterprise).

The number of violations was 6% of all found deficiencies (on the average 4 violations per enterprise) at uranium production enterprises (JSC PPGKhO, JSC Khiagda, JSC Dalur, JSC "Elkonsky ore mining and smelting combine", JSC Lunnoe). One inspection of NMCA issues was conducted at each of these enterprises (4% of all inspections of NMCA).

Number of violations revealed in 2013 amounted to 38% of the total number (on the average 3 violations per each enterprise) at research and development organisations (all in all 20 research and development Institutes and research centers are under supervision). Totally on the average 2 inspection of NMCA issues were conducted at each enterprise (23 % of all inspections of NMCA state).

In educational establishments (MIPhI, MEI, TPU) the number of found violations of NMCA amounted to 14% of the total number (on the average 3 violations per each educational establishment). On the average 2 inspections of NMCA issues were conducted at each enterprise (4% of all inspections).

#### ***Analysis of compliance with requirements to nuclear materials control and accounting in organizations.***

Analysis of all found violations demonstrates that most of them are related to measurement system, physical inventories, access control system and arrangement of NMCA in the organisation, keeping accounting and reporting records. Analysis results are given in Table 31 and on Figure 6 .

***Table 31***

#### ***Analysis of violations in nuclear material control and accounting***

<b><i>Violation category</i></b>	<b><i>Share,</i></b>
General requirements to the availability of licenses and permits, nuclear materials registration and discard	4
Organization of nuclear materials balance areas	9
Access control system	11
Measurement system	17
Nuclear materials transfers	2
Physical inventory	26



Maintenance of accounting and reporting documentation	2
Organization of accounting and control system	27
Personnel training and testing	2

Violations as to item "General requirements to the availability of licenses and permits, nuclear materials registration and discard" are generally caused by the failure to comply with the requirements to nuclear materials discard in transferring into the category of radioactive waste, absence of nuclear materials accounting in open radionuclide sources.

Violations related to the organisation of material balance areas (MBA) are caused, as a rule, by a failure to meet the requirements to MBA description.

Violations related to access control system are mainly caused by the following:

lack of required access control assurance (absence of seals or monitoring system in nuclear material access locations);

absence of seals checks between physical inventories.

absence of documented registration of such a check.

Principle violations related to nuclear materials measurement system, as a rule, are as follows:



**Fig. 6.** Analysis of violations in nuclear material control and accounting

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absence of measurements program for MBA;

non-conformity of measurements program to an actual available measurement system of enterprise (undue making changes to measurement program). It is necessary to note, that accounting and validation measurements of nuclear materials (including control in transfers) are made with different efficiency in different organisation. Part of organisations are active in making validation measurements, including that in nuclear materials control in transfers and during nuclear materials physical inventories, whereas some organisations lack respective effective control of nuclear materials with the help of validation measurements.

Violations related to nuclear materials transfer, as a rule, are caused by undue registration of nuclear materials (or absence of the registration) in transfers among MBAs.

Principle violations related to nuclear materials physical inventory:

the balance is not stricken for all kinds of nuclear materials, or error of inventory difference is not calculated;

the requirements to drawing up the order for physical inventories.

Principle violations related to keeping accounting documents and presentation of reporting documents:

all required reporting documents are not formalised;

there are errors in keeping accounting documents (non-conformity of different documents or non-compliance with the established procedure of making amendments).

Violations related to the organisation of NMCA system:

locations of losses are not identified, and procedures of nuclear materials losses assessment are not established in nuclear material control and accounting documents;

administrative control of nuclear materials control and accounting state is not exercised;

list of control and accounting documents is not defined, or their forms are not given.

Within the reporting period one anomaly in NMCA was found, that is exceeding admissible limits of inventory difference in the course of physical inventory.

There were no registered cases of theft or losses of nuclear materials.

Actual availability of nuclear materials as per accounting data was verified during inspection measurements made by Rostekhnadzor's inspectors in 2013.

Inspection measurements were made with the help of technical measurement tools with the aim to assure independent control of nuclear materials availability. Thus, to confirm actual availability of nuclear materials they use weighing equipment (to validate masses of nuclear materials accounting units), gamma-ray spectrometry equipment (scintillation gamma-ray spectrometers NaI InSpector and germanium semiconductor detectors Ge InSpector for validation of nuclear material kind and its isotope composition or uranium enrichment, neutron coincidence counters (for validation of nuclear material mass in accounting units).

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In the course of inspection measurements they use calibrated through the established procedure devices of both Rostekhnadzor and supervised organisations. Measurements are made in accordance with qualified measurement procedures with observance of respective measurement quality control procedures.

Basic causes of deficiencies in NMCA are as follows:

low level of knowledge and drawbacks in personnel training in NMCA area;

insufficient administrative control over NMCA state;

absence in some organizations of a unified nuclear materials accounting service assigned the function of comprehensive methodological support to the control and accounting system in all divisions, and also the functions of administrative control over the state of NMCA in their organization.

With the aim to correct deficiencies Rostekhnadzor:

conducts inspections of NMCA state; takes measures of administrative penalties in case violations found of federal code and regulations;

participate in the revision of regulatory methodological federal and departmental documents in the field of NMCA.

In accordance with Rostekhnadzor's functions, its Headquarters (HQ) and territorial bodies participate in granting permits to nuclear facilities personnel for the right to carry out activities in the field of atomic energy use, including personnel of organizations providing NMCA.

With the aim to enhance the efficiency of supervision over control and accounting, Rostekhnadzor HQ specialists took part in 10 scheduled inspections, in which totally 53 violations of NMCA were found (32% of the total number of revealed violations).

Organisations managing nuclear materials have registered accounting areas and submit respective reporting documents to the Federal system for NMCA (FIS). Rostekhnadzor inspects FIS functioning, timeliness and accuracy of respective submittals. On the whole based on NMCA results IN 2013, one can draw a conclusion, that reporting documents are submitted to FIS in due time and in full scope.

#### ***2.2.6.2. State system of radioactive substances and radioactive waste control and accounting***

The list of regulatory documents on radioactive substances and radioactive waste:

Federal Law No. 170-FZ of November 21, 1995 "On the Use of Atomic Energy";

Federal Law No. 102-FZ of June 26, 2008 "On assurance of measurements uniformity";

Federal Law "On the waste management and introduction of changes into some legal acts of the Russian Federation" N.190-FZ of July 11, 2011;

Federal Law No.294-FZ of December 26, 2008, "On protection of rights of legal persons and individual entrepreneurs in exercising state control (supervision) and municipal control";

Administrative regulation for execution by the Federal Environmental, Industrial and Nuclear Supervision Service of the state function of state control and supervision over physical protection of nuclear installations, radiation sources, storage facilities, nuclear materials and radioactive substances, the unified state

control and accounting system for nuclear material, radioactive substances and radioactive waste approve by order No.703 dated December 15, 2011, of the Federal Environmental, Industrial and Nuclear Supervision Service;

Regulations for arrangement of the state system for radioactive substances and waste control and accounting" approved by the Government Decree No. 1298 of 11.10.1998;

Regulations for the state control and accounting of radioactive substances and waste including registration of radwaste and radwaste storage facilities by state body for management in the field radwaste handling, approved by Decree of the Government of the Russian Federation dated 19.11.2012 No.1188;

Provisions on the state radioactive substances and waste control and accounting in the Russian Federation enacted by the order of Minatom of Russia No. 761 of 10.12.1999;

Basic regulations for control and accounting of radioactive substances and radioactive waste in an organization (NP-067-11), approved by Rostekhnadzor order No.67 dated 31.01.2012;

Regulations for transfer of nuclear materials into the category of radioactive waste (NP-072-13) approved by Rostekhnadzor order No.288 of 05.07.2013.

Forms of reporting in the field of state NMCA, procedure and intervals of reports submittal approved by RF Minatom order No.600 of 31.08.2009, registered by Minyust of Russian on 13.10.2001, reg. No.15019.

In the framework of supervision of the of state system of radioactive substances and radioactive waste control and accounting the Rostekhnadzor exercises supervision over 1669 organisations and 73 regional information and analytical centers (IAC) of the state system of NMCA.

Totally 1,020 inspections of radioactive substances and radioactive waste state were conducted in 2013, which approximately the same as in 2012 (1,046 inspections). 509 violations of federal codes and regulations and license validity terms conditions were found (322 ones in 2012). Increase in revealed violations number is caused by efficiency enhancement of supervision over radioactive substances and radioactive waste control and accounting, including that by inspectors proficiency increase. 20 administrative fines were imposed in the total amount of 900 thousand roubles.

In 2013 the information was registered on the loss of 1 source of ionising radiation and 67 orphan and non-registered sources, that were identified (out of them 57 - control sources of fire alarm detectors, which refer to sealed radionuclide sources of the 5<sup>th</sup> (lower) category of hazard).

Specialists of Interregional Territorial Departments of nuclear and radiation safety were exercising control over the progress of investigation cases of orphan or non-registered sources of radioactive materials on the territory of supervised enterprises.

The regime of continuous state supervision was established in 60 organisations out of 1,669 supervised organizations carrying out activity on radioactive substances and radioactive waste management. Inspections of arrangement of radioactive substances and radioactive waste are conducted in these organisations as scheduled and continuous surveillance.

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***Inspections of radioactive substances and radioactive waste state, found violations of regulatory documentation requirements***

The most number of violations in radioactive substances and radioactive waste control and accounting were found by the inspectors of the Central ITD (CITD) NRS (41% of the total violations number). The most number of violations are revealed by the inspectors of the Volga ITD (VITD) NRS (24% of the total violation number), and the Siberian and Far East ITD NRS (22% of the total amount of violations).

Analysis of revealed violations in the field of radioactive substances and radioactive waste control and accounting demonstrates, that the number of violations are related to the requirements to the arrangement of radioactive substances and radioactive waste control and accounting in the organisation and to maintaining and submittal of reporting documents (Table 32 and Figure 7) .

***Table 32***

***Analysis of violations in control and accounting of radioactive substances and radioactive waste***

<b><i>Violation category</i></b>	<b><i>Share, %</i></b>
General requirements to registration and discard	6
Organization of control and accounting system	38
Access control system	13
Measurement system	10
Transfers	2
Inventory taking	10
Maintenance of accounting and reporting documentation	13
Personnel training and examination	8

The causes of indicated violations are insufficient management attention to the issues of radioactive substances and radioactive waste control and accounting, as well as low level of knowledge and professional training of personnel in the field of radioactive substances and radioactive waste control and accounting.





**Fig. 7.** Analysis of violations in control and accounting of radioactive substances and radioactive waste

With the aim to correct indicated deficiencies Rostekhnadzor:

conducts inspections of state of radioactive substances and waste control and accounting;

apply administrative penalties in case violations of federal codes and regulations are found;

participate in development and revision of regulatory and methodological documents in the field of radioactive substances and radioactive waste control and accounting.

With the aim to enhance the efficiency of supervision over control and accounting, Rostekhnadzor HQ specialists took part in 10 scheduled inspections, they identified totally 42 violations in the field of radioactive substances and radioactive waste control and accounting (8% of the general number of violations revealed).

Submission of reporting documents to the information system of radioactive substances and radioactive waste control and accounting was checked during inspection of radioactive substances and radioactive waste control and accounting state in 2013. Reporting documents of both organisations and IAC were examined. As compared with 2012, the number of found violations related to non-submittal of reports reduced drastically.

To enhance the quality of supervisory activity it is necessary to continue inspectors training, as well as to improve the work on updating and explanation of the federal codes and regulations requirements and rules in the field of radioactive substances and radioactive waste control and accounting by supervised organisations specialists.

### *2.2.7 Mining facilities*

#### **2.2.7.1 Coal industry**

In 2013, the state control in the field of industrial safety of coal industry enterprises was exercised in 101 mines (mines, mine subsidiaries, underground mining divisions), 231 open-pit mines, and 69 preparation and briquetting plants. All coal mines, excluding 12 mines in the Rostov Region, are hazardous due to coal dust explosiveness. Out of 101 mines, 12 are not hazardous by methane, 21 mines belong to Category I by methane, 9 - to Category II, 16 - to Category III, 24 are not categorized, and 19 are hazardous due to unexpected outbursts. In 10 mines coal is mined in beds prone to bounces. At that, 388 facilities under supervision were in operation. The overall coal production in 2013, as compared to 2012, decreased by 3.17 million tons and amounted to 352.01 million tons (99.1 % of 2012 output), including:

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101.005 million tons (89.4 % of 2012 output) of deep-mined coal;

251.005 million tons (103.6 % of 2012) of coal produced by open-cut mining.

The average headcount of the employees involved in the coal industry amounted to 158,092 persons.

The indicators of the industrial safety state in the coal industry enterprises in 2013, as compared to 2012, are distributed as indicated below. In 2013, 11 accidents occurred at the enterprises under supervision, among them three accidents involving group casualties, and one group casualty incident not associated with an accident. 38 persons suffered in accidents and group casualty incidents, 33 of them were fatally injured. The total number of fatally injured persons amounted to 63.

In 2012, 16 accidents occurred, among them three accidents involving group casualties, and one group casualty incident not associated with an accident. 33 persons suffered in accidents and group casualty incidents, six of them were fatally injured. The total number of fatally injured persons amounted to 36.

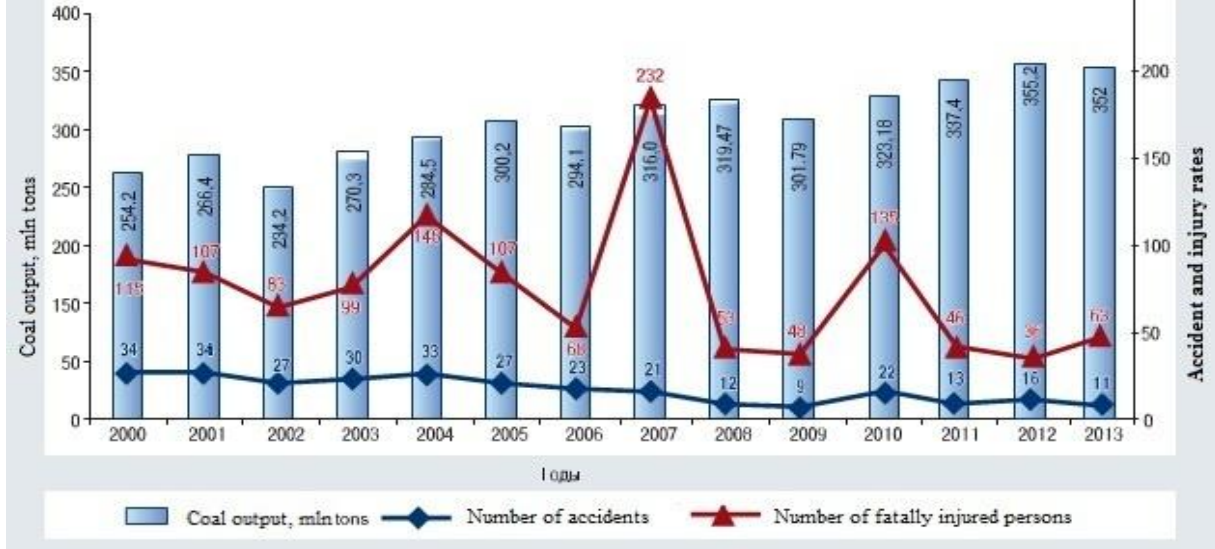
While the accident rate decreased by 31%, the number of fatal injuries increased by 75 %.

The data on the dynamics of coal output, occupational fatal injury rate, and accident rate for the period of 1996 - 2013 are presented in Table 33 and in Figure 8.

**Table 33**

**The dynamics of coal output, occupational fatal injury rate, and accident rate for the period of 1996 - 2013**

<b>Year</b>	<b>Coal output, million tons</b>	<b>Number of accidents</b>	<b>Number of fatally injured persons</b>	<b>Fatal injury-to-coal output ratio, individuals/million tons</b>
1996	255.0	78	134	0.52
1997	244.4	56	242	0.99
1998	232.4	54	139	0.60
1999	249.1	39	104	0.41
2000	254.2	34	115	0.45
2001	266.4	34	107	0.40
2002	234.2	27	83	0.35
2003	270.3	30	99	0.37
2004	284.5	33	148	0.52
2005	300.2	27	107	0.36
2006	294.1	23	68	0.23
2007	316.0	21	232	0.73
2008	319.47	12	53	0.16
2009	301.79	9	48	0.15
2010	323.18	22	135	0.41
2011	337.4	13	46	0.13
2012	355.2	16	36	0.10
2013	352.01	11	63	0.18



**Fig. 8.** The dynamics of coal output, occupational fatal injury rate, and accident rate

Among operating hazardous industrial facilities the most dangerous ones are mines, where coal is mined underground.

In 2013, all 11 accidents occurred during underground mining, the number of accidents associated with methane explosion (flash), water flooding (inrush), and bounces increased (Table 34)

**Table 34**

**Breakdown of accidents by types and fatal injuries by injury factors in 2012-2013**

No.	Type of accident, fatal injuries	Accidents			Fatal injuries		
		2012	2013	+/-	2012	2013	+/-
1	Explosion (burning, flashes) of gas and carbon dust	2	4	+2	1	27	+26
2	Fire (endogenous, exogenous)	9	4	-5	—	—	—
3	Bounce	—	1	+1	—	—	—
4	Sudden outburst of coal, rock, gas	—	—	—	—	—	—
5	Destruction of buildings, structures, technical devices	2	—	-2	4	1	-3
6	Transport	—	—	—	6	6	—
7	Electric current	—	—	—	4	4	—
8	Machines and mechanisms	—	—	—	3	6	+3
9	Falls	—	—	—	4	2	-2
10	Flooding of mine tunnels, inrush of water, clay	—	1	+1	—	4	+4
11	Sloughing, collapse of lining	1	1	—	10	13	+3
12	Poisoning, suffocation	—	—	—	—	—	—
13	Other types of accidents and injuries	2	—	-2	4	—	-4
<i>Total:</i>		<i>16</i>	<i>11</i>	<i>-5</i>	<i>36</i>	<i>63</i>	<i>+27</i>

The overall damage incurred by accidents amounted to 842,668 thousand rubles. Methane explosions (flashes) were caused by:

- violations of explosionproof electrical equipment operating rules;
- deviations from the requirements of design-engineering documentation;
- delayed repair of ventilation structures;
- lack of proper control of aerological situation in mine tunnels;
- accumulation of explosive concentration of methane-air mixture;

insufficient monitoring of dust deposition in mine tunnels.

Water inrush was caused by:

violations of the requirements of regulatory technical documents during mining activities in the zone prone to water inrush;

failure to carry out measures specified in the project.

The bounce occurred due to violation of the requirements of the chart of bounce preventive measures;

low efficiency of conducted preventive measures to bring the massif in bounce-proof condition in the abutment zone.

Fatal injuries related to sloughing were caused by:

violations of the requirements of safety regulations, mine tunnel lining charts, extraction level charts, duty regulations;

poor labor discipline;

insufficient qualification of the personnel of the enterprises;

unsatisfactory upkeep of workplaces.

Fatal injuries related to the impact of machines and mechanisms were caused by:

failure to ensure safe working conditions and labor protection during operation of mining equipment;

abatement of production control of fulfillment of industrial safety and labor protection requirements;

deficiencies of teaching safe working methods and techniques, which manifested themselves in violation of work procedure.

Fatal injuries related to flooding of mining tunnels were caused by failure to take immediate measures to rescue the people caught in an accident, localize and eliminate the accident.

In all of the cases, accident investigation commissions pointed out low level of departmental production control of fulfillment of industrial safety requirements in operated hazardous industrial facilities on the part of officials of the enterprises.

Breakdown of fatal injury cases by types of activities is presented in Table 35. Distribution of accidents and fatal injury cases among Rostekhnadzor regional bodies and subjects of the Russian Federation is presented in Table 36.

*Table 35*

**Breakdown of fatal injury cases by types of activities  
(deep, surface, open-cut mining)**

Hazardous factors of occupational injuries	Fatal injury rate in 2012/2013					
	Deep mining		Surface technical complex and coal preparation plants		Open-cut mining	
	Single cases of fatal injuries	Fatal injuries during accidents and group casualty incidents	Single cases of fatal injuries	Fatal injuries during accidents and group casualty incidents	Single cases of fatal injuries	Fatal injuries during accidents and group casualty incidents
Explosion, flash, burning of gas and carbon dust		1/27 (+26)				

Destruction of buildings and engineering structures	3/1 (-2)					1/— (-1)
Sloughing, collapse of lining	7/11 (+4)	3/2 (-1)				
Transport	4/5 (+1)				2/1 (-1)	
Electric current	1/3 (+2)		1/— (-1)		2/1 (-1)	
Machines and mechanisms	2/3 (+1)		1/ 2 (+1)		—/1 (+1)	
Flooding, inrush of water, clay		—/4 (+4)				
Falls	3/1 (-2)		1/— (-1)		—/1 (+1)	
Other factors	3/— (-3)	1/— (-1)				
<b>Total:</b>	<b>23/24 (+1)</b>	<b>5/33 (+28)</b>	<b>3/2 (-1)</b>		<b>4/4 (—)</b>	<b>1/— (-1)</b>

**Table 36**

**Distribution of accidents and fatal injury cases among Rostekhnadzor regional bodies and subjects of the Russian Federation in 2012–2013**

Rostekhnadzor regional body	Number of accidents			Number of fatally injured persons		
	2012	2013	+/-	2012	2013	+/-
<b>Siberian Department:</b>	<b>12</b>	<b>9</b>	<b>-3</b>	<b>24</b>	<b>30</b>	<b>+6</b>
The Kemerovo Region	12	9	-3	24	30	+6
<b>Trans-Baikal Department:</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>—</b>	<b>—</b>	<b>—</b>
The Republic of Buryatia	—	—	—	—	—	—
The Zabaikalye Territory	1	—	-1	—	—	—
<b>Yenisei Department:</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1</b>	<b>1</b>	<b>—</b>
The Republic of Khakassia	—	—	—	1	—	-1
The Irkutsk Region (since 2013)	—	—	—	—	1	+1
<b>Lower Don Department:</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>7</b>	<b>2</b>	<b>-5</b>
(since 2013 - Northern Caucasus Dept.)						
The Rostov Region	1	—	-1	7	2	-5
<b>Sakhalin Department:</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2</b>	<b>+2</b>
The Sakhalin Region	—	—	—	—	2	+2
<b>Far East Department:</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1</b>	<b>3</b>	<b>+2</b>
The Amur Region	—	—	—	—	1	+1
The Primorie Territory	—	—	—	1	1	—
The Khabarovsk Territory	—	—	—	—	1	+1
<b>Urals Department:</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2</b>	<b>+2</b>
The Chelyabinsk Region	—	—	—	—	2	+2
<b>Pechora Department:</b>	<b>2</b>	<b>2</b>	<b>—</b>	<b>3</b>	<b>23</b>	<b>+20</b>
The Komi Republic						
<b>Total in the coal-mining industry:</b>	<b>16</b>	<b>11</b>	<b>-5</b>	<b>36</b>	<b>63</b>	<b>+27</b>



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## **Description of major accidents**

**At 4:18 on January 20, 2013**, in the conveyor gallery 52-09, "Mine No.7" of Kotinskoye Mine Administration of JSC SUEK-Kuzbass, methane flash occurred, as a result of which eight people were fatally injured.

### Technical causes of the accident:

1. Accumulation of explosive methane-air mixture in the conveyor gallery face.
2. Availability of methane-air mixture local inflammation source, which evolved during operation of KP-21 cutter-loader machine with faulty explosion protection.
3. Non-compliance of actual flow of air supplied to the conveyor gallery face during drifting with rated flow rate.
4. Conducting mining activities and conveyor gallery drifting while methane content and air flow rate monitoring equipment was out of order.
5. Conducting mining activities and conveyor gallery drifting while the explosion prevention spraying system of KP-21 cutter-loader machine was out of order.
6. Violations of start-up equipment operation, shunting of interlocks, disconnection of protections.

### Organizational causes of the accident:

1. Inadequate control of the condition of methane content and air flow rate monitoring equipment in the mine.
2. Inadequate control of the condition of electrical equipment in the mine.
3. Insufficient level of production supervision of compliance with the requirements of industrial safety on the part of the mine engineers and technicians.
4. Insufficient training and qualification level of personnel involved in operation of hazardous industrial facilities.
5. Understaffing of air-gas monitoring service for conducting daily verification of equipment operable condition.
6. Tardy implementation of accident elimination plan and call of the paramilitary mine-rescue unit

**On February 11, 2013**, methane-dust-air mixture exploded in the extraction area of longwall face 832-u of Troinoy coal-bed in Voorkuta Mine belonging to JSC Vorkutaugol of JSC Severstahl-resurs. 21 persons suffered from the explosion, 19 of whom were fatally injured.

### Technical causes of the accident:

1. Accumulation, inflammation and explosion of methane-dust-air mixture in the chamber of 1-LU belt conveyor drive installed in the Rail slope 35-u of Troinoy coal-bed.
2. Failure to accomplish dust suppression measures for preventing and localizing coal dust explosions in mine tunnels of the extraction area of longwall face 832-yu of Troinoy coal-bed.
3. Violations of explosion safety during the use of electrical equipment in the Rail slope 35-yu of Troinoy coal-bed which resulted in the lighting cable short circuit while the start-up equipment leakage current protection was disabled.

### Organizational causes of the accident:

1. Inadequate supervision by the mine managerial personnel and specialists over observance of industrial safety requirements in the extraction area of longwall face 832-yu of Troinoy coal-bed.
2. Low quality of quarterly audit, shift-time and daily inspections of section No.8 electrical equipment in the absence of appropriate control by power-mechanical service of the mine.

**On March 26, 2013**, destruction of the wall of working in the brake slope face 282 in

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Osinnikovskaya Mine belonging to JSC OUK Yuzhkuzbassugol resulted in water inrush into operating mine tunnels. Out of 143 people who were in the mine, 139 people got out to the surface, 4 persons died.

Organizational-technical causes:

1. Conducting mining activities in the zone prone to water inrush using technical documentation that did not include measures to ensure safe mining activities in hazardous zone.
2. Unavailability of drainage of slope 68 and of dewatering plants installed in it for pumping-out drained water in the volume of 42,067 m<sup>3</sup>.
3. Failure to restrict the access of personnel not involved in discharging water, and of workers sent into mine tunnels adjacent to the zone prone to water inrush and located in potential flooding zone.
4. Failure to take measures specified in the operative part of the accident elimination plan section pertaining to accident type - "water inrush."
5. Tardy call of the paramilitary mine-rescue unit.

**On May 2, 2013**, in Korkinskaya Mine belonging to JSC Chelyabinsk Coal Company, during works conducted to eliminate mine tunnel - supply passageway of bed P-lower, the process envisaged lining removal and roof caving. When successive cycle was carried out, the rock collapsed and two persons were fatally injured.

Causes of group casualties:

1. Weakening of the tunnel lining along the entire area of straddle extraction. Dismantling of metal arch support straddles MN14.9 and slackening of locks of 10 benches in a row along the entire area of straddle extraction, which resulted in displacement of the lining frames, their fall, and collapse of the roof rock.
2. Insufficient training of workers who extracted the lining.
3. Dispatching the workers into the mine tunnel that did not satisfy safety requirements.
4. Violation of labor discipline, careless and unauthorized actions of the work doers.
5. Insufficient consideration of mining and geological conditions when drawing up the chart of extraction of metal straddles.
6. Inadequate production control by the mine managerial personnel and specialists of observance of industrial safety requirements

**The activity of the operating organizations aimed at enhancement of industrial safety, including matters of technical re-equipment and reconstruction of the enterprises**

**Enterprises supervised by Far East Department of Rostekhnadzor**

Obsolete equipment that ran out of its rated operating life but is still used in the enterprises of the branch constitutes approximately 20% of the entire pool of technical devices in operation.

The first priority task of JSC Urgalugol enterprise (carrying out deep and open-cut mining of Urgalsk coal deposit in Verhnebureinsk area of the Khabarovsk Territory) is construction completion and commissioning, in the first half of 2014, of concentrating mill Chegdomyn having productive capacity of 6 million tons of coal per year.

Refurbishment of the fleet of mine dump trucks used for removal of capping and transportation of coal to the coal storage yard of Bureinskiy-2 open pit was completed.

In coal-bed V-26, new ventilation-air-heating plant AVM-21 was commissioned. The plant supplies air at a rate of up to 9000 m<sup>3</sup>/min and employs automated control system operated from the dispatcher's panel.

An integral part of monitoring of noxious gases generated during tunneling and second

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working in coal-bed V-26, and of protection against their effects is the mine multifunctional system MIKON-1R. In cooperation with Ingortech Company, SUBR-1P system for emergency and selective call of people in the mine, and facilities for searching people were installed and put in operation.

Major enterprises (JSC Primorskugol, JSC DGK, LLC KINGCOAL Far East, JSC Coal Open Pit Rakovskiy) in accordance with the developed investment programs approved by the owner conduct systematic replacement of mining equipment with expired term of operating life by modern, higher-capacity mining equipment, including foreign-made machinery, the use of which was authorized by Rostekhnadzor.

Thus, for instance, within the framework of equipment upgrade and modernization the following was purchased in 2013:

In Luchegorskoye subsidiary of JSC DGK:

hydraulic excavator KOMATSU PC-1000 — 1 vehicle;

bulldozer Hitachi-1200 — 2 vehicles;

dump truck BelAZ 37547 (carrying capacity - 40 tons) — 4 vehicles.

In Vostochnoye subsidiary of JSC Primorskugol:

tunneling machine R-110 — 1 machine.

In Vostochnoye subsidiary of JSC Primorskugol:

bulldozer KOMATSU D-275A — 2 vehicles;

front-end loader NZAS — 1 vehicle;

refueller KamAZ — 1 vehicle;

motor grader DZ-98 — 1 vehicle.

In LLC KINGCOAL Far East:

bulldozer CAT D11T — 1 vehicle; excavator

CAT-374 — 1 vehicle; excavator VOLVO

EC-700 — 2 vehicles; dump truck BelAZ-

7547 — 4 vehicles.

### **Enterprises supervised by Lena Department of Rostekhnadzor**

In 2013, the Lena Department reviewed and registered 293 industrial safety review reports, 283 of which were related to extension of rated operating life of technical means (126 reports were not approved due to low quality of their preparation). In addition, in the framework of supervision over the condition of technical devices, the Lena Department imposed administrative penalties for operating the equipment with expired rated term of operating life that was not extended.

In 2013, modernization of equipment was underway in coal-mining enterprises of the Republic of Sakha (Yakutia). Thus, for instance, in Neryungy open pit of JSC HK Yakutugol 9 new type dump trucks BelAZ-75306 with carrying capacity of 220 tons, 3 bulldozers Caterpillar CAT00D9RPWDM03, truck-mounted crane LIEBHERR LTM with lifting capacity of 150 tons, excavator PJHD 2300, local airing plant UMP-30-081 mounted on BelAZ-7958 were commissioned.

In Denisovskaya Mine of JSC UK Neryungyugol four belt conveyors 1PT-120, 1LT-120, 3LLT-1000, 3LT-1000 were commissioned.

New equipment assuring safety of mining activities in mine tunnels was commissioned:

in Jebariki-Haya Mine of JSC HK Yakutugol, Mikon-1R mine gas analyzer multifunctional system and Radius-2 wireless system for underground annunciation, paging, surveillance, and search of people caught in an accident were installed;

In Denisovskaya Mine of JSC UK Neryungyugol, multifunctional safety system is in process

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of assembly and phased commissioning.

### **Enterprises supervised by Trans-Baikal Department of Rostekhnadzor**

The equipment used in the Zabaikalye Territory and the Republic of Buryatia is gradually upgraded and modernized. For example, in JSC Razrez Tugnuyskiy incorporated in JSC Siberian Coal Power Company (SUEK), automatic traffic control (ATC) system "Carrier" manufactured by Vist Grupp Company was installed in BelAZ dump trucks. This system enables monitoring of vehicle condition both in real time, using on-line map, and for any elapsed time interval (fuel consumption, transported load quantity, traveling speed, etc.).

In 2013, LLC Chitaugol purchased and commissioned hydraulic quarry excavator Komatsu PS-1250, which made it possible to decommission two outdated excavators EKG-5A. The plans for 2014 envisage the procurement of K-702MBA wheeled tractor, T-11 bulldozer, BM-205 drilling machine, DZ-98 and GS-15 motor graders.

In open pit Urtuiskiy of JSC Priargunskoye Mining-Chemical Production Association, technical re-equipment effort and replacement of outdated and worn-out equipment are in progress as scheduled. In accordance with the investment program of the enterprise, the following new bulldozer-type vehicles were procured: two T-35.01YaBR-1 bulldozers, four T-15.01YaBR bulldozers, six BelAZ-75473 quarry dump trucks, tractor-towing vehicle mounted on BelAZ-74470 chassis, Hitachi ZX-1200 excavator; 15 outdated dump trucks were replaced.

Low-capacity open-pit mines are equipped with modern foreign-made (Chinese, Japanese) loaders, the use of which is authorized by appropriate permits.

### **Enterprises supervised by Sakhalin Department of Rostekhnadzor**

At present, coal-mining enterprises of the Sakhalin Region, for the most part, use obsolete and worn-out equipment: in open-cut mining - mainly, second-hand foreign-made excavators and bulldozers; in mines and coal concentration enterprises - domestic equipment manufactured as far back as in the 70-80-ies of the past century.

In 2013, LLC Sakhalinugol procured new belt conveyors 2KLB and 2KLL. In open-cut mining enterprises, the following equipment and vehicles were commissioned: dump trucks (13 vehicles), bulldozers (7 vehicles), excavators (9 vehicles), fork-lift trucks (3 vehicles), self-propelled milling plants (2 units), drilling rigs (2 units).

In 2013, the results of industrial safety reviews of 47 technical devices, 11 buildings and engineering structures with expired terms of operating life were reviewed; positive decisions on approval thereof were taken.

### **Enterprises supervised by Siberian Department of Rostekhnadzor**

For analyzing and monitoring the condition of aging and renewal of basic assets, the operating organizations together with the Siberian Department of Rostekhnadzor compiled the list of the basic equipment operated in hazardous industrial facilities. The enterprises specified the terms for renewal and modernization of production facilities.

Based on the analysis of the equipment condition considering the extent of its wear, the following data were obtained (percentage of the quantity of equipment with expired rated term of operating life) for the types of process equipment used in open-cut mining activities:

excavators — 58 %;

quarry dump trucks — 14 %;

bulldozers — 20 %;

drilling rigs — 14 %;

locomotives — 29 %.

Among the mining equipment used in the mines of Kuznetsk Basin, the fleet of electric

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locomotives is worn out most of all. 236 electric locomotives and 530 batteries are in operation, among them 80% of electric locomotives and 75% of batteries exceeded their specified lifetime.

60 out of 63 vertical hoisting units ran out of their rated lifetime (95%), 62 out of 73 inclined hoisting units ran out of their rated lifetime (85%). For the ventilation units these figures are 124 out of 191 (65 %) correspondingly. All stationary units with expired rated service life underwent expert examination by organizations holding Rostekhnadzor license for the possibility of their further operation.

During on-the-spot checks, attention was focused on the condition of technical devices, periods of their operation and availability of industrial safety review reports, granting permit to operate the technical device with expired rated operating life in hazardous industrial facilities.

In 2013, the Siberian Department reviewed 2009 industrial safety review reports on technical devices used in coal-mining enterprises; in 81 cases decisions to reject the approval were taken.

### **Enterprises supervised by Yenisei Department of Rostekhnadzor**

In 2013, the Yenisei Department reviewed:

for the Krasnoyarsk Territory - 236 industrial safety review reports on technical devices with expired rated operating life, in 66 cases decisions to reject the approval were taken;

for the Republic of Khakassia, - 85 industrial safety review reports on technical devices with expired rated operating life, in 6 cases decisions to reject the approval were taken;

for the Irkutsk Region - 46 industrial safety review reports.

On the whole, improvements were made in the condition of basic assets and technical level of coal-mining branch enterprises, but this effort progresses at a very slow pace. Actually all enterprises need reconstruction and technical re-equipment, but equipment improvement and renewal activities proceed very slowly.

For the purpose of timely replacement of equipment and technical re-equipment, JSC Razrez Nazarovskiy developed the investment program Support of Production Capacity of JSC Razrez Nazarovskiy that envisages measures for replacement of worn-out equipment, technical re-equipment and modernization of equipment. Within the framework of this program, modernization of EKG-10 No.124, ESh 10-70 No. 13 excavators was accomplished (low voltage cables and control system of main and auxiliary drives were replaced, automatic centralized lubrication system Lincoln was installed).

JSC Razrez Berezovskiy is implementing extensive investment program aimed at replacement and modernization of main equipment: replacement of dump trucks, bulldozers, special technical equipment, modernization of conveyors, excavators. In 2013, modernization of trunk belt conveyor KLM-5250 No.4 was accomplished. Within the framework of implementing the investment program Modernization of KLM-4500 Main Drives, KLM-4500 No.2 main drives were modernized through using EPN-1250 inductor electric actuators.

In 2013, new equipment was delivered to JSC Razrez Berezovskiy: 2 dump trucks KOMATSU HD 785-7; 1 motor grader GD825A-2; 1 multipurpose machine MKSM-800; 1 drilling machine BM-205D-01; instead of worn-out vehicles and those ones with expired rated service life: 2 BelAZ-7555B; 1 loader MKSM-800; 1 tractor MTZ-BM205. In 2014, replacement of BelAZ-7555B dump truck and T-500-based DZ-141 bulldozer with new KOMATSU vehicles is scheduled. For the period of 2014–2018, further modernization of conveyors KLM-4500 No.3, KLM- 5250 No.1, KLM-5250 No.3 is planned.

In JSC SUEK-Krasnoyarsk Razrez Borodinskiy, modernization of the equipment of EKG-8us No.26 and ESh 11/70 No.51 excavators was accomplished. For maintaining production



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capacity, productivity record keeping device, SBR-160A-24 drilling rig, RS-400-7 caterpillar excavator were put in operation, automated system for technical registration of electric power consumed by excavators was installed and adjusted.

In JSC SUEK-Khakassia Khakasskaya Mine, industrial safety review aimed at extension of operating life of DKVr 4-6,5/13 steam boilers, MKYu2-16/31 mechanized lining, VOD 16-P axial ventilators was conducted. Daily monitoring of the mine main equipment operating time and service life is conducted within the framework of JSC SUEK corporate software, including Parus code, SAP ERP code.

### **Enterprises supervised by Northern Caucasus Department of Rostekhnadzor**

In 2013, 224 industrial safety review reports on technical devices, buildings and engineering structures were reviewed. In five cases the conclusions of industrial safety reviews were not approved.

In coal mines supervised by Northern Caucasus Department of Rostekhnadzor 87 lifting facilities are in operation, 54 of which are on the surface and 33 are underground, 48 (55%) of which ran out of rated operating life. 12 (52%) out of 23 main ventilation units also ran out of rated operating life.

### **Enterprises supervised by the Pechora Department of Rostekhnadzor**

At the present time, technical re-equipment and reconstruction of enterprises is in progress in Pechora Basin coal mines. Thus, new vacuum-pump stations were commissioned in Severnaya and Zapolyarnaya mines. Renewal of mineral processing equipment (sieves, hydrocyclones, flotation machines) is going on, and new techniques of coal concentration are introduced (SE Pechorskaya TsOF). In surface facilities of the mines, installation of automatic powder fire-extinguishing systems is going on. A network of monorail diesel roads is being developed.

For ensuring safety and emergency resistance of coal-mining enterprises of Vorkuta, the underground machine monitoring system of Smok-1 type was introduced in the mines. This system provides gathering, archiving, transmission and visualization of the data on operation of mechanisms. Besides, works were started to introduce automated monitoring and control system TORO, which makes it possible to exercise monitoring of mandatory accomplishment of scheduled preventive technical maintenance and repair of mining equipment. Work safety management system was put in operation (personnel annunciation function); as the second stage, works are in progress to perform positioning of an underground group. In the future, on the basis of this system, the functioning of wireless emergency communication for conducting emergency rescue operations will be provided.

New generation mining equipment is delivered to JSC Vorkutaugol. In 2013, in the mines and open-pit mine Yun-Yaginskiy belt conveyors manufactured by JSC Alexandrov Machine-Building Works, tunneling machines WIRTH and SANDVIK, cleaning machine SL300, Komatsu bulldozers and dump trucks, Steinert magnetic separators (for concentrating mill) were commissioned.

In the supervised coal-mining industry enterprises, the Provisions for arranging and exercising production control during HIF operation, developed and duly agreed upon with Rostekhnadzor territorial bodies, are in force. Special permits (licenses) for licensed types of activities issued in accordance with the established procedure are available.

HIF operating organizations have valid risk liability insurance agreements against damnification during HIF operation.

Basic indicators of supervisory and monitoring activity in 2012-2013 are presented in Table 37.

Table 37

**Basic indicators of supervisory and monitoring activity of territorial bodies in the sphere of industrial safety of hazardous industrial facilities in coal-mining industry**

No. of item	Indicators of supervisory and monitoring activity	2012	2013
1	Number of organizations under supervision (legal entities)	867	844
2	Number of facilities under supervision	417	388
3	Number of inspectors (actual), persons	158	138
4	Number of examinations conducted	8,067*	7,482*
5	Number of violations revealed	50,727	57,937
6	Administrative penalties imposed, total	7,014	7,688
	Including the following:		
6.1	administrative suspension of activities including	561	666
6.1.1	temporary ban on activity	161	604
6.2	administrative fine	6,453	7,020
7	Total sum of fines recovered, thousand rubles	330,856	305,528
8	Cases handed over to law-enforcement bodies against infringers of industrial safety requirements	13	20

\* Including 7,039 examinations (checks) — in 2012, 6,769 — in 2013 conducted in the course of continuous state monitoring (supervision) of hazardous industrial facilities.

In 2013, the inspectors of coal-mining supervision conducted 7,482 checks of the enterprises operating coal-mining industry HIFs, including 252 scheduled inspections checks and 7,228 unscheduled checks, of which 6,769 checks were conducted in the course of continuous state monitoring (supervision), as a result of which 57,937 violations were revealed (including 57,749 violation of mandatory requirements set forth by the legislation, 188 cases of failures to fulfill the orders of state monitoring (supervision) bodies.

317 checks were conducted in accordance with earlier issued orders, and 43 checks - on the basis of the orders (instructions) of the head of the state monitoring (supervision) body, issued in accordance with the instruction of the President of the Russian Federation, the Government of the Russian Federation; 55 checks were conducted in accordance with requests of the applicants, two checks were conducted by the Office of Public Prosecutor with participation of Rostekhnadzor regional bodies, 62 checks were conducted together with other bodies of state control.

As compared to 2012, the number of examinations conducted in 2013 decreased by 7%, at the same time the number of revealed violations increased by 14%.

As a result of checks conducted in 2013, 7,912 orders were issued, 509 cases of administrative offenses were filed. The total sum of imposed fines amounted to 321,804 thousand rubles including 334 thousand rubles imposed on individuals, 151,226 thousand rubles — on officials, and 170,244 thousand rubles — on legal entities. The amount of the imposed administrative fines totaled 305,528 thousand rubles.

As compared to 2012, the total sum of fines decreased from 330,856 thousand rubles to 321,804 thousand rubles. The number of inspectors engaged in supervision in the coal-mining industry decreased by 13% (from 158 persons in 2012 to 138 persons in 2013).

Licensing activity is conducted in accordance with the Federal Law No.99-FZ of May 4, 2011, "On Licensing Individual Types of Activity", Provision on Licensing the Operation of Hazard Class I, II and III Explosion-, Fire- and Chemically Hazardous Industrial Facilities approved

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by the Decree of the Government of the Russian Federation No. 492 dated June 10, 2013, and Provision on Licensing Industrial Safety Review Activity approved by the Decree of the Government of the Russian Federation No. 682 dated July 4, 2012.

In 2013, the Department for Supervision in Coal Industry of Rostekhnadzor central office prepared and handed over to the Department for Support of Organizational and Control & Licensing and Authorizing Activities of Rostekhnadzor the following drafts for preparation and handing over to the applicants:

12 licenses for conducting industrial safety review activities, 7 of which - for granting the license, 5 - for renewal of the license; in 8 cases decisions to reject the license issue or renewal were taken;

1 license for operation of explosion and fire hazardous industrial facilities, in 3 cases decisions to reject the license renewal were taken with respect to one organization.

Regional bodies issued 20 licenses for operation of explosion and fire hazardous industrial facilities, 14 licenses were renewed. In 3 cases the licenses were rejected.

In 2013, the Department for Supervision in Coal Industry prepared the drafts of 426 permits for operation of technical devices in coal-mining industry HIFs. In 14 cases decisions to reject the issue of permits were taken.

### **Introduction of industrial safety management systems and progress made in the implementation of other innovation projects associated with safety assurance and emergency resistance of coal-mining enterprises**

In accordance with the requirements of the Federal Law No. 116-FZ dated July 21, 1997, "On Industrial Safety of Hazardous Industrial Facilities," coal-mining enterprises operating Class I and II hazardous industrial facilities shall create industrial safety management system and provide its functioning.

The requirements to documentary support of industrial safety management systems created in the organizations operating hazard Class I or II hazardous industrial facilities are established in the Decree of the Government of the Russian Federation dated June 26, 2013, "On Approval of the Requirements to Documentary Support of Industrial Safety Management Systems."

Industrial safety management systems envisage the accomplishment of a set of interrelated technical and organizational measures taken by coal-mining enterprises operating HIFs with the purpose of preventing accidents and incidents in HIFs, localization and elimination of the consequences of such accidents.

For ensuring safety and emergency resistance of coal-mining enterprises of Pechora coal Basin, underground machine monitoring system of SmoK-1 type was introduced in the mines, providing gathering, archiving, transmission and visualization of the data on operation of mechanisms. Besides, works were started to introduce automated monitoring and control system TORO, which makes it possible to exercise monitoring of mandatory accomplishment of scheduled preventive technical maintenance and repair of mining equipment. Work safety management system was put in operation (personnel annunciation function); as the second stage, works are in progress to perform positioning of an underground group.

New generation mining equipment is delivered to JSC Vorkutaugol. Thus, since the beginning of 2013, JSC Vorkutaugol procured and commissioned the following equipment:

SE Vorkutinskaya Mine - selective action tunneling machine Virth; monitoring equipment KRUG;

SE Komsomolskaya Mine - smoldering seat early detection system GESO;

SE Zapolyarnaya Mine - tunneling machine Virth; MIKON hardware (NCS);

SE Vorgashorskaya Mine - tunneling machine Virth; front-end tunneling machine Ikehoff Continuous Miner CM2/37H; mining dinting loader EL-160 LS.

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The deployment of this equipment makes it possible to enhance industrial safety condition in coal mining industry HIFs.

All mines of Kuznetsk Basin are hazardous due to gas and coal dust explosiveness. In 15 mines, mining activities are conducted in beds that are hazardous or posing a threat of coal and gas outburst.

In the mines of Kuznetsk Basin, degassing of coal-beds prior to mining is promoted for the purpose of steady decrease of accident and injury rates.

At the present time, degassing is conducted in 30 mines. If in 2007, degassing was conducted in 12 taking-out sections, nowadays it is accomplished in 35 sections.

In 2013, within the framework of Task order of the Government of the Russian Federation dated January 24, 2012 No.VP-P9-1pr, Rostekhnadzor and Rostrud (Federal Labor and Employment Service) continued joint periodic checks of accomplishment of the programs of actions pertaining to industrial safety, labor protection, and functioning of personnel training, re-training, and refresher training, including the use of individual protection means. Joint checks were conducted in coal-mining enterprises of the Kemerovo, Rostov, Sakhalin, Irkutsk Regions, the Komi Republic, the Republic of Khakassia, the Republic of Sakha (Yakutia), the Republic of Buryatia, the Chukotka Autonomous Area, the Krasnoyarsk, Khabarovsk, Primorye, and Zabaikalye Territories.

The checks conducted and analysis of their results made it possible to reveal a number of systematic violations of industrial safety, among which are the requirements of:

operation of mine transport;

operation of power-mechanical equipment;

aeration and control of dust-gas environment;

fire protection assurance;

maintenance of design, process and operation documentation;

survey support of mining activities.

In 2013, Rostekhnadzor headquarters developed and approved 10 regulatory documents on fire safety, prevention of explosions of dust-gas-air mixture, ventilation, operation of electrical equipment. The documents were registered with the Ministry of Justice of Russia according to the established procedure. Branch research and development institutes, experts of coal-mining companies and of Rostekhnadzor were involved in developing regulatory documents.

In order to increase the effectiveness of the state monitoring (supervision) it is necessary that updating of industrial safety requirements be continued taking into account the development of technologies used in HIFs of coal-mining industry.

Thus, in accordance with the Rostekhnadzor Action Plan for implementation of basic directions of the State policy in the area of fuel and energy complex, reproduction of mineral and raw materials sources, industrial and energy safety for 2014, approved on December 27, 2013 by Rostekhnadzor Chairman (acting) A. Ferapontov, the Department for Supervision in Coal Industry scheduled the development of Instruction for Dust Control in Coal Mines; Instruction for Conducting Fire Hazardous Works in Mine Tunnels, Coal Mine Heads and Coal-Cleaning Plants; Instruction for Isolation of Tunnels and Worked-out Areas in Coal Mines.

In 2014, the Department for Supervision in Coal Industry will proceed with accomplishment of measures envisaged in the Program for ensuring further improvement of labor conditions, enhancement of mining activity safety, decrease of accident and injury rates in coal-mining industry, maintaining of combat readiness of paramilitary mine-rescue and emergency response and rescue units approved by the Ministry of Energy of Russia, the Ministry of Health Care and Social Development of Russia, EMERCOM of Russia, Rostekhnadzor and

agreed upon with Coal-Mining Industry Trade Union of Russia.

## 2.2.7.2. Ore Mining and Non-metallic Industry, Facilities of Underground Construction

### Features of Supervised Facilities

In 2013, the state mining supervision was exercised in mineral raw material extraction, reprocessing facilities and underground construction facilities (see the Table). In accordance with amendments to Federal Law No.116-FZ of July 21, 1997, "On Industrial Safety of Hazardous Industrial Facilities," in 2013, facilities of open-cut extraction of placer and generally found minerals without blasting operations were excluded from a list of HIFs. The state mining supervision in the facilities excluded from a list of HIFs was exercised in accordance with the Law of the Russian Federation "On the Subsoil" and other laws, regulatory and legal acts of the Russian Federation. In 186 hazard class I facilities of the mining branch registered in the State Register of HIFs, mining supervision is exercised in the course of implementation of procedure of permanent state control.

The bulk of mined rock extracted in HIFs of the mining industry branch amounted to 1,291.1 million m<sup>3</sup>. This includes:

54.4 million m<sup>3</sup>, extracted by deep mining method (8 % increase as compared with 2012 level); 1236.7 million m<sup>3</sup>, extracted by open-cut method (25.2 decrease as compared with 2012 level). The decrease in the bulk of mined rock extracted by open-cut method is explained by the fact that this amount does not include the minerals extracted in the facilities that lost their status of hazardous facilities in 2013.

The total number of workers in HIFs of the branch amounted to 395,780 persons. The structure of the supervised organizations and HIFs of the mining industry is presented in Table 38.

*Table 38*

### The structure of supervised organizations and hazardous industrial facilities of the mining industry

No. of item	Indicator	Total	Altogether					
			Non-ferrous metallurgy mining organizations	Ferrous metallurgy mining organizations	Gold-mining organizations	Chemical mining industry	Construction material recovery organizations	Underground construction organizations
1	Number of organizations under supervision (legal entities)	3,624	141	67	459	114	2,684	159
2	Number of facilities under supervision	4,815	242	163	703	98	3,380	229
	Including the following:							
3	pits (mines)	165	50	17	59	23	13	3
4	open pits	3,297	120	86	464	43	2,584	—
5	concentration, grinding-sorting, and sintering plants	897	52	51	91	27	676	—
6	dredges	52	—	—	11	—	41	—



7	flushing devices	100	—	—	54	1	45	—
8	waterside structures	45	12	8	22	2	1	—
9	underground construction facilities	176	8	1	1	—	2	164
10	facilities using the subsoil for the purposes not associated with extraction of minerals	83	—	—	1	2	18	62

### Basic indicators of supervisory and monitoring activity

The basic indicators of supervisory and monitoring activity of the state mining supervision, presented by regional bodies for the period of 2012–2013, are summarized in Table 39.

*Table 39*

### Indicators of supervisory and monitoring activity of the state mining supervision in 2012–2013

Indicators of supervisory activity	2012	2013
Number of facilities under supervision	6,706	3,624
Total number of checks conducted	5,682	4,016
Including the following:		
within the framework of fulfillment of orders issued following the earlier conducted check	1,326	916
Total number of checks, in the course of which violations of the law were revealed	3,274	1,787
Total number of legal entities, individual entrepreneurs who committed violations of the law	2,513	1,257
Violations of the law revealed - total number:	27,744	15,892
Total number of orders issued following the checks	3,317	1,697
Total number of administrative penalties imposed as a result of the checks:	3,530	2,277
Including the following:		
administrative suspension of the activity	139	112
administrative fines - total number	3,380	2,165
finest imposed on legal entities	627	365
Total sum of the fines imposed, thousand rubles	129,352	94,472
Including the following:		
on legal entities, thousand rubles	84,029	62,297
Total number of checks during which violations were revealed and materials were handed over to law-enforcement bodies for opening criminal cases	28	19

In spite of the decreased total number of checks, compared to 2012, which was the result of the exclusion of a number of operational industrial facilities from a list of hazardous facilities, 1,436 checks of mining and survey activities and of handling of explosives were conducted in addition to the mentioned checks in the course of implementation of procedure of permanent state monitoring (supervision).

In the process of checks, 15,892 violations of industrial safety requirements were revealed, and orders for elimination thereof issued. The number of checks, as a result of which violations of the law were revealed, amounted to 44% of the total number of checks. For the most part, violations were revealed in the course of the checks to verify the fulfillment of

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orders (verification checks). In the course of these checks, only those violations that were not eliminated are recorded, and there is no legal basis for revealing additional violations.

In accordance with the Code of Administrative Offenses of the Russian Federation, 2,277 administrative penalties were imposed. Here, pursuant to presentations of Rostekhnadzor regional bodies and corresponding judicial decisions, in 112 cases administrative suspension of activity was imposed, and in 19 cases materials of the checks were handed over to law-enforcement bodies for initiating criminal proceedings in relation to the violations revealed. Administrative fines were imposed on legal entities based on the results of 20% of the checks conducted. The sum of fines imposed on legal entities for violations of industrial safety requirements constituted 66% of the total sum of the fines. The average amount of the fine imposed on a legal entity person was 170.7 thousand rubles, which is 22% higher than in 2012. Increased indicators of application of administrative penalties to legal entities reflect large scale of violations of the law for which the penalties were imposed, as well as higher exactingness of mining supervision inspectors.

In 2013, Rostekhnadzor headquarters together with engaged regional bodies reviewed the materials for issuing 18 operation licenses for explosion and fire hazardous industrial facilities. Following the review, 8 licenses were granted, 9 - renewed, in one case granting of the license was denied. During scheduled and unscheduled examinations, Rostekhnadzor regional bodies verify availability of licenses and observance of license requirements and conditions by the licensees.

Rostekhnadzor regional bodies assessed the preparedness of the mining industry organizations for localization and elimination of accident consequences.

Action plans for accident localization and elimination of their consequences are available in the supervised enterprises and are annually updated. Availability and relevance of plans are verified by Rostekhnadzor regional bodies in the course of the checks.

Rostekhnadzor representatives took part in drills and other actions of the mining industry enterprises. In 2013, altogether 145 drills were conducted; in nine cases preparedness of the enterprises for accident localization and elimination of their consequences was found to be unsatisfactory.

For organizations operating hazard class I and II mining facilities, availability of agreements concluded with emergency rescue units is obligatory, which is verified by mining supervision bodies in the course of the checks.

Formation of auxiliary mine-rescue teams in organizations operating hazard class I and II mining facilities is also subject to monitoring by Rostekhnadzor regional bodies. As of January 1, 2014, auxiliary mine-rescue teams were formed in 118 organizations.

Provisions on production control of observance of industrial safety requirements were developed and are available in each mining enterprise. Availability, correct development, and actual implementation of the Provisions are examined by Rostekhnadzor regional bodies in the course of scheduled and unscheduled checks of the supervised enterprises and facilities.

Rostekhnadzor headquarters reviewed 954 industrial safety review reports. In 53 cases, conclusions of the review reports were not approved. Approval was denied due to violations of currently valid regulations for conducting the reviews and presentation of their results. The following types of review reports were examined: 38 — for design documentation during technical re-equipment; 35 — for extension of service life of buildings and engineering structures; 717 — for technical devices; 58 — for declarations of industrial safety; 106 — for other documentation.

Rostekhnadzor headquarters reviewed 537 applications and accompanying materials for obtaining Rostekhnadzor permits for the use of technical devices at hazardous industrial

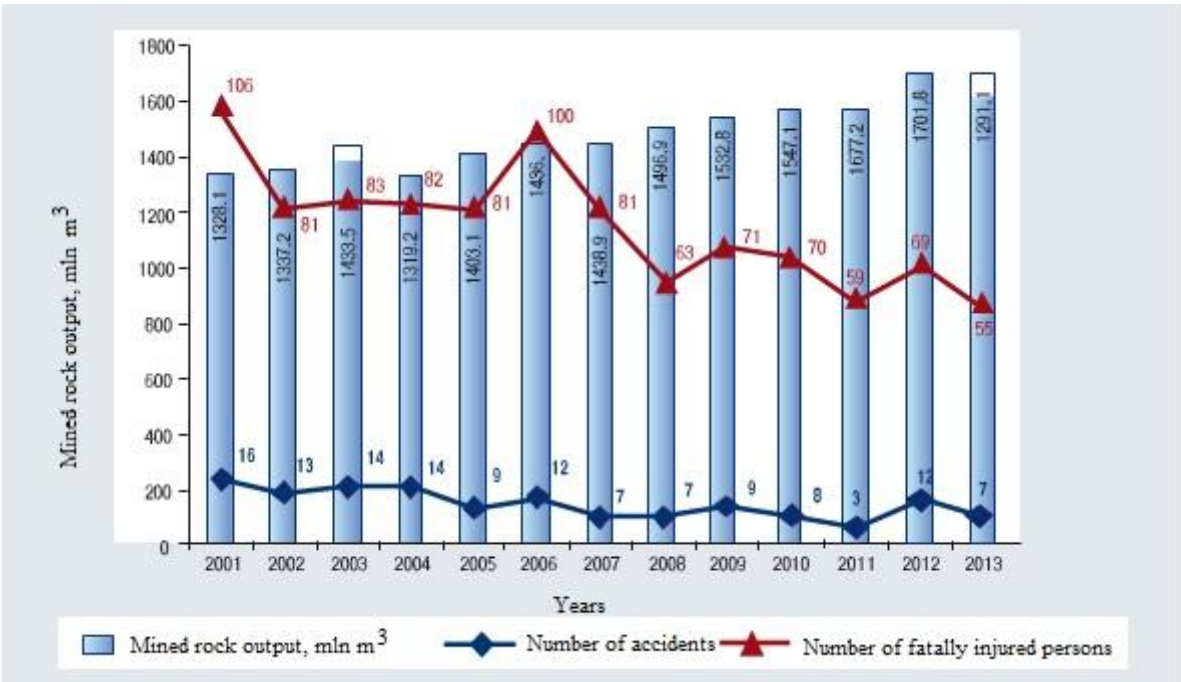
facilities of the mining industry. Following the review of the submitted documents, 524 permits for use of technical devices and process equipment were issued (taking into account the applications submitted in 2012). In 93 cases the permits for the use of technical devices were denied, and motivated explanation of the grounds for the denial was given. Contracts on insurance against liability for third party damnification were signed by all mining industry enterprises operating hazardous industrial facilities.

### Dynamics of the bulk of mined rock versus occupational injury and accident rates

The dynamics of the bulk of mined rock versus injury and accident rates in the mining industry in 2001–2013 is shown in Figure 9.

### Indicators of accident and injury rates

In 2013, seven accidents that occurred in the mining industry branch HIFs were registered, which is 42% less than in 2012. The material damage inflicted by the accidents amounted to 29.2 millions rubles (515.3 million rubles - in 2012).



**Fig. 9.** The dynamics of the bulk of mined rock versus injury and accident rates in the mining industry in 2001–2013

*Note.* For the year 2013, the bulks of minerals extracted only in hazardous industrial facilities are indicated. The distribution of accidents among the mining industry enterprises is shown in Table 40. The majority of the accidents were registered in agrochemical raw material extraction enterprises. Owing to the measures taken, no accidents were registered in the enterprises extracting raw materials for non-ferrous metallurgy, where the majority of the accidents occurred in 2012.

*Table 40*

**Distribution of accidents among the mining industry enterprises**

Enterprises	2012		2013	
	number	%	number	%
Extraction of raw materials for ferrous metallurgy	2	16.7	1	14.3
Extraction of raw materials for non-ferrous	4	33.3	—	—
Mining of precious metals	2	16.7	—	—

Extraction of materials for construction	2	16.7	2	28.5
Construction sector	1	8.3	1	14.3
Extraction of agrochemical raw materials	1	8.3	3	42.9
<b>Total:</b>	<b>12</b>	<b>100</b>	<b>7</b>	<b>100</b>

Compared to the previous reporting period, the number of individuals who suffered from the accidents decreased by 26%. The majority of those, who suffered in the accidents - 3 persons (including 2 fatally injured persons) - was registered in agrochemical sector enterprises.

The number of workers injured in the accidents in mining industry enterprises in 2012 and 2013 is presented in Table 41.

Table 41

**The number of workers injured in the accidents**

Enterprises	Number of cases	Number of victims				Table 42
		total	fatalities	severely injured	slightly injured	
2013						
Extraction of raw materials for ferrous metallurgy	1	1	1	—	—	
Mining of precious metals	—	—	—	—	—	
Extraction of agrochemical raw materials	3	3	2	1	—	
Extraction of materials for construction	2	2	2	—	—	
Extraction of raw materials for non-ferrous metallurgy	—	—	—	—	—	
Construction sector	1	1	1	—	—	
Total in 2013:	7	7	6	1	—	
2012						
Extraction of raw materials for ferrous metallurgy	2	1	1	—	—	
Mining of precious metals	2	7	3	4	—	
Extraction of agrochemical raw materials	1	1	—	—	1	
Extraction of materials for construction	2	1	—	1	—	
Extraction of raw materials for non-ferrous metallurgy	4	1	1	—	—	
Construction sector	1	—	—	—	—	
Total in 2012:	12	11	5	5	1	

The data on accident rates in 2012 and 2013 in mining enterprises according to the types of works are presented in Table 42.

The majority of the accidents occurred during open-cut mining works. In deep-mining the number of accidents decreased by 60% as compared to 2012.

**Accident rates in mining enterprises according to the types of works**

Types of works	2012		2013		Increase (decrease)
	Number of accidents	%	Number of accidents	%	
Deep mining	5	41.7	2	28.6	-3
Open-cut mining	4	33.3	5	71.4	+1
Factory/plant operation	3	25	—	—	-3
<b>Total:</b>	<b>12</b>	<b>100</b>	<b>7</b>	<b>100</b>	<b>-5</b>

The causes of accidents also underwent changes. While in 2012 the majority of the accidents resulted from natural effects (landslides, collapses) and hard-to-predict causes (fires, uncontrolled explosions), in 2013 most of the accidents occurred during the use of motor transport and are associated with the human factor.



**Table 43**

Breakdown of accidents by the types of dangerous occurrences in 2012 and 2013 is shown in Table 43.

**Breakdown of accidents by the types of dangerous occurrences**

Types of accidents	Quantity	
	2012	2013 r
During operation of machines and mechanisms		
Motor transport	2	5
Railway transport	—	1
Fires, inflammations, uncontrolled explosions	4	—
Collapses, including landslides	4	1
Floodings	2	—
<b>Total:</b>	<b>12</b>	<b>7</b>

In 2013, the majority of the accidents and the increase in their number were registered in JSC Apatite (the Murmansk Region) under supervision of North-Western Department of Rostekhnadzor.

Distribution of the accidents among Rostekhnadzor regional bodies and the subjects of the Russian Federation in 2012 and 2013 is presented in Table 44.

**Table 44**

**Distribution of accidents among Rostekhnadzor regional bodies and constituent entities of the Russian Federation**

Regional bodies of Rostekhnadzor, RF constituent entities	2012	2013
Interregional Technological Department:	—	<b>1</b>
the Taimyr Autonomous Area	—	1
Upper Don Department:	<b>1</b>	—
the Belgorod Region	1	—
North-Western Department:	<b>1</b>	<b>3</b>
the Murmansk Region	1	3
Northern Caucasus Department:	<b>1</b>	—
the Krasnodar Territory	1	—
Volga Department:	<b>1</b>	—
the Chuvash Republic	1	—
Western Urals Department:	<b>2</b>	<b>1</b>
the Perm Territory	—	1
the Republic of Bashkortostan the	1	—
Orenburg Region	1	—
Middle Volga Department:	—	<b>1</b>
the Samara Region	—	1
Lena Department:	<b>1</b>	—
the Republic of Sakha (Yakutia)	1	—
Urals Department:	<b>1</b>	—
the Sverdlovsk Region	1	—
Trans-Baikal Department:	<b>1</b>	—
the Zabaikalye Territory	1	—
Yenisei Department:	—	<b>1</b>
the Republic of Khakassia	—	1
Far East Department:	<b>3</b>	—
the Khabarovsk Territory	2	—
the Primorye Territory	1	—
<b>Total:</b>	<b>12</b>	<b>7</b>

## Group casualties

In 2013, there were three group casualty incidents in the mining industry enterprises. Nine people were injured: one of them - fatally, and five - severely. The indicators of group injury rates are commensurable with similar indicators of 2012 (Table 45).

*Table 45*

**Number of workers injured in group casualty cases**

Enterprises	Number of cases	Number of victims			
		Total	fatalities	severely injured	slightly injured
Extraction of raw materials for non-ferrous metallurgy	1	2	—	2	—
Extraction of agrochemical raw	1	2	—	—	2
Mining of precious metals	1	4	1	3	—
<b>Total in 2013:</b>	<b>3</b>	<b>8</b>	<b>1</b>	<b>5</b>	<b>2</b>
Mining of precious metals	2	8	3	5	—
<b>Total in 2012:</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>5</b>	<b>—</b>

The majority of persons who suffered in group casualty cases worked in precious metal mining enterprises.

## Fatalities

In 2013, 55 persons were fatally injured in mining industry enterprises. As compared to 2012, fatal injury rate decreased by 20% (Table 46).

*Table 46*

**Distribution of fatal injuries among mining industry enterprises**

Enterprises	Number of persons injured				2013 vs 2012
	2012		2013		
Mining of precious metals	27	39.5 %	17	30.9 %	-10
Extraction of raw materials for non-ferrous	20	29 %	11	20.0 %	-9
Extraction of raw materials for ferrous	7	10.1 %	3	5.5 %	-4
Extraction of materials for construction	9	13 %	12	21.8 %	+3
Nickel mining	1	1.4 %	5	9.1 %	+4
Construction sector	2	2.8 %	3	5.5 %	+1
Extraction of agrochemical raw materials	3	4.2 %	4	7.2 %	+1
Total:	69	100 %	55	100 %	-14(-20 %)

The majority of fatal injury cases were registered in precious metal mining enterprises and in the enterprises extracting raw materials for non-ferrous metallurgy.

Deep mining continues to be the most injury-hazardous activity that brought about more than a half of fatalities both in 2012 (55%) and in 2013 (60%) as well (Table 47).

Table 47

**Breakdown of fatalities in mining enterprises by types of works**

Types of works	2012		2013		-/+
	Pers.	%	Pers.	%	
Open-cut mining	22	33.3 %	18	32.7 %	-4
Deep mining	39	55 %	33	60.0 %	-6
Grinding and concentrating mills	8	11.7 %	4	7.3 %	-4
<b>Total:</b>	<b>69</b>	<b>100 %</b>	<b>55</b>	<b>100 %</b>	<b>-14</b>

On account of unsatisfactory arrangement of the work process and low labor discipline in the course of accomplishment of highly hazardous works, the primary injury factors are still the following ones: collapse of mined rock pieces (2012 — 26.2 %, 2013 — 30.9 %); violations related to operation of process transport (2012 — 18.8 %, 2013. — 23.6 %), equipment and mechanisms (2012 — 23.2 %, 2013 — 23.6 %), Table 48.

Table 48

**Breakdown of fatalities by injury factors**

Year	Injury factors								Total
	Collapse of mined rock	Transport	Explosion	Work with mechanisms	Electricity	Poisoning, burns	Fall from height	Other	
2013	17	13	—	13	5	2	5	—	55
	30.9 %	23.6 %	—	23.6 %	9.1 %	3.7 %	9.1 %	—	100 %
2012	18	13	3	16	3	—	14	2	69
	26.2 %	18.8 %	4.3 %	23.2 %	4.3 %	—	20.3 %	2.9 %	100 %

In 2013, fatalities were registered in mining enterprises supervised by Interregional Technological (9 cases), North-Western (8 cases), Western Urals (7 cases), Urals (7 cases), and Lena (5 cases) Departments of Rostekhnadzor. The number of fatalities in the enterprises supervised by Trans-Baikal (-7) and Upper Don (-3) Departments decreased. No fatalities were registered in the enterprises supervised by Pechora, Northern Caucasus, Volga-Oka, Northern Urals and Sakhalin Departments of Rostekhnadzor. Comparative data on fatalities are presented in Table 49.

Table 49

**Distribution of fatalities among regional bodies and the subjects of the Russian Federation**

Rostekhnadzor regional departments, subjects of the Russian Federation	2012	2013	-/+
Interregional Technological Department:	<b>11</b>	<b>9</b>	<b>-2</b>
Moscow,	2	6	
the Taimyr Autonomous Area	7	3	
the Chukot Autonomous Area	2		
Caucasus Department:	<b>1</b>	<b>1</b>	—
the Republic of Dagestan	—	1	+1
the Karachayevo-Circassian Republic	1	—	-1

<b>Rostechnadzor regional departments, subjects of the Russian Federation</b>	<b>2012</b>	<b>2013</b>	<b>-/+</b>
Central Department:	<b>1</b>	<b>1</b>	—
the Moscow Region	—	1	+1
the Yaroslavl Region	1	—	-1
Upper Don Department:	<b>4</b>	<b>1</b>	<b>-3</b>
the Belgorod Region	4	1	—
Oka Department:	<b>2</b>	<b>3</b>	<b>+1</b>
the Ryazan Region	1	1	—
the Kaluga Region	1	1	—
the Tula Region	—	1	+1
North-Western Department:	<b>5</b>	<b>8</b>	<b>+3</b>
Saint Petersburg	—	1	+1
the Leningrad Region	1	—	-1
the Murmansk Region	3	7	+4
the Arkhangelsk Region	1	—	-1
Pechora Department:	<b>1</b>	—	<b>-1</b>
the Komi Republic	1	—	-1
Northern Caucasus Department:	<b>1</b>	—	<b>-1</b>
the Rostov Region	1	—	-1
Lower Volga Department:	<b>1</b>	—	<b>-1</b>
the Volgograd Region	1	—	-1
Volga Department:	<b>1</b>	—	<b>-1</b>
the Republic of Marii El	1	—	-1
Western Urals Department:	<b>7</b>	<b>7</b>	—
the Perm Territory	2	1	-1
the Republic of Bashkortostan	4	5	+1
the Orenburg Region	1	1	—
Middle Volga Department:	—	<b>1</b>	<b>+1</b>
the Samara Region	—	1	+1
Lena Department:	<b>6</b>	<b>5</b>	<b>-1</b>
the Republic of Sakha (Yakutia)	6	5	-1
Urals Department:	<b>8</b>	<b>7</b>	<b>-1</b>
the Sverdlovsk Region	6	3	-3
the Chelyabinsk Region	2	4	+2
Siberian Department:	<b>2</b>	<b>2</b>	—
the Novosibirsk Region	—	1	+1
the Republic of Altai	—	1	+1
the Kemerovo Region	2	—	-2
Trans-Baikal Department:	<b>11</b>	<b>4</b>	<b>-7</b>
the Zabaikalye Territory	7	3	-4
the Republic of Butyatia	4	1	-3
Yenisei Department:	<b>2</b>	<b>3</b>	<b>+1</b>
the Irkutsk Region	1	2	+1
the Republic of Khakassia	—	1	+1
the Krasnoyarsk Territory	1	—	-1
Far East Department:	<b>3</b>	<b>2</b>	<b>-1</b>
the Khabarovsk Territory	1	—	-1
the Amur Region	1	1	—
the Primorye Territory	1	1	—
the Kamchatka Territory	—	—	—

<b>Rostekhnadzor regional departments, subjects of the Russian Federation</b>	<b>2012</b>	<b>2013</b>	<b>-/+</b>
North-Eastern Department: the Magadan Region	<b>2</b> 1	<b>1</b> 1	<b>-1</b>
<b>Total:</b>	<b>69</b>	<b>55</b>	<b>-14</b>

Typical cases involving casualties that occurred in the course mining activities.

## Accidents

Accidents associated with the use of motor transport.

**On November 10, 2013**, in Koashva open pit of JSC Apatite (supervised by North-Western Department of Rostekhnadzor), the driver of a BelAZ truck, en route to the loading point, while trying to escape an emergency, began backward movement, as a result of which the rear wheels of the truck crossed over the safety bank and the truck fell down from the quarry face.

Organizational and technical causes of the accident:

unsatisfactory condition of the roadbed;

entry of the transport into the pit without preliminary inspection of the roadbed. Railway accidents.

**On November 18, 2013**, in Karnasurt pit of LLC Lovozero Ore Mining and Processing Enterprise (supervised by North-Western Department of Rostekhnadzor), during repair of the rail track, gradient parameters were not observed, as a result of which the moving electric locomotive collided with the fire safety gate opening, and one miner and an electrician, who were in the cab, were injured.

The accident was caused by absence of control of the compliance of rail gradient and clearance parameters with the specified values during the repair.

Accidents caused by collapse of mined rock.

**On February 4, 2013** in Shubinskiy pit of LLC KNAUF GIPS KUNGUR (supervised by West Urals Department of Rostekhnadzor) the quarry mining face collapsed during mining, which resulted in burying the excavator and death of the shovelman.

The accident was caused by failure to update the working design and specify the quarry mining face parameters by calculation of angle of slides of work faces under new mining and geological conditions.

## Group casualties

**On November 10, 2013**, in Konevinskoye Mining and Processing Enterprise of LLC Khuzhir Enterprise (supervised by Trans-Baikal Department of Rostekhnadzor), during removal of ice blockage in the bended section of the pipe by compressed air, the pipe broke loose from its mounts and jammed the drift miners and the mining foreman.

Causes of the incident:

violations of the pipeline installation chart;

admission of workers without work order and not familiarized with the instruction for work to removal of ice blockage in mine tunnel.

## Fatalities

**On February 18, 2013**, in JSC Karalveyem Pit (supervised by Interregional Technological Department of Rostekhnadzor), during drifting of the rise, the drift miner died of poisoning by noxious gases generated as a result of blasting operations.

Causes of the incident:

unauthorized intrusion into gas-laden and dead rise without self-rescue breathing apparatus;



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failure of the mining foreman to report gas pollution of the rise to the area supervisor and the dispatcher and inform them of the necessity to call mine-rescue team ;  
failure to take measures to remove gases from the mine tunnel and prohibit access to the rise containing poisonous gases.

**On March 16, 2013**, in LLC Mining Construction Company - Shahtoproyekt (supervised by Lena Department of Rostekhnadzor), during mine tunnel lining installation, cleaved piece of rock fell on the drifter.

Causes of the incident:

performance of works not specified in the lining installation chart;  
lining installation and roof control chart was not timely revised to take into account the changes in mining conditions.

**On April 11, 2013**, in LLC Sangalyk Diorite Pit (supervised by Northern Urals Department of Rostekhnadzor), during preparation for repair of SMD-118 jaw crusher, the repairman was fatally injured when the counterweight broke off and flew beyond the working area limits.

The incident cause - breaking of the flywheel counterweight resulting from mounting hole fatigue cracking that was not timely detected.

**On May 22, 2013**, in Korshunovskiy Mining and Processing Enterprise (supervised by Yenisei Department of Rostekhnadzor), during installation of the cap of the pressure axle of EKG-8I No.69 saddle bearing, the shovelman assistant fell from the platform from a 3.5-meter height on the reduction gear of the excavator pressure platform and was fatally injured.

Causes of the incident:

conducting works at height without using safety protective equipment;  
use of faulty machines, mechanisms, equipment.

**On November 19, 2013**, in JSC Apatite (supervised by North-Western Department of Rostekhnadzor), an electrician was fatally injured by electrical current when changing the cable phasing in the connecting box.

Cause of the incident - failure of the person to fulfill organizational and technical measures assuring safety of work at night in low illuminance conditions during de-energizing.

Casualties resulting from organizational (organizational and technical) causes constitute the overwhelming majority of cases. Most of the technical causes of the accidents are attributed to deviation from the requirements of design and process documentation, non-compliance of design choices with production and safety assurance conditions, as well as unsatisfactory technical condition of engineering structures, and the use of faulty equipment.

Based on the results of investigations of accidents and fatality cases, the root causes thereof are distributed as follows:

8 % - violations of work processes;

42 % - unsatisfactory arrangement of works;

19 % - low level of supervision over fulfillment of industrial safety requirements in the process of mining activities;

24 % - violation of work regulations and labor discipline by the worker, deficiencies of professional training;

7 % - poor knowledge of the requirements of safety codes and standards.

In the reporting period, fatalities caused by alcoholic intoxication of workers while performing their job functions were once again registered. This is the evidence of low labor discipline in the organizations, absence of medical examination of workers before the shift. Administrations of the enterprises do not take measures to exclude alcoholic intoxication of workers while performing their production tasks.

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## **Introduction of industrial safety management systems**

Industrial safety management systems are designed to provide:

identification, analysis and prediction of accident risk and related threats in hazardous industrial facilities;

planning and implementation of accident risk reduction measures;

participation of the personnel of operating organizations in the development and implementation of accident risk reduction measures.

Rostekhnadzor headquarters prepared the amendments that were included in article 11 of Federal Law No.116-FZ of July 21,1997, "On Industrial Safety of Hazardous Industrial Facilities," pertaining the requirements to hazard class I or II HIF operating organizations for development of industrial safety management systems and assurance of their functioning. The development of industrial safety management systems is supervised by Rostekhnadzor regional bodies.

As of January 1, 2014, industrial safety management systems were created in 107 organizations of the mining industry branch. However, the organizational structure of major mining industry enterprises is arranged in such a way that administrative functions and financial assets are concentrated in management companies, to which this statutory requirement does not apply. The operating organizations do not possess the authoritative and financial capabilities for implementing the requirements for development of industrial safety management systems.

In 2013, 8175 mining facilities (63 %) were excluded from the state register of hazardous industrial facilities.

In accordance with the Law of the Russian Federation, "On the Subsoil," these excluded hazardous industrial facilities of the mining branch remain under the state mining supervision. At the same time, state monitoring of hazard class I enterprises of the mining industry exercised in the framework of continuous supervision was strengthened.

Increased number of administrative penalties imposed in 2013 as a result of conducted checks on legal entities who committed violations of law in the sphere of industrial safety reflects the significance of detected violations of law as well as increased exactingness of the mining supervision inspectors.

The results of comprehensive checks of JSC DMC ALROSA, JSC Stoilenskiy Mining and Processing Enterprise, JSC Severstahl, JSC MPE Norilsk Nickel with the participation of Rostekhnadzor headquarters employees, as well as analysis of accident and casualty investigation reports demonstrate that the overwhelming majority of violations and casualties are the result of the human factor effect.

### *2.2.8 Survey Activities and Safe Use of the Subsoil*

In 2013, the state mining supervision bodies exercised monitoring and supervision of safety of activities related to the use of subsoil and survey activities in 3,184 organizations and 8,438 facilities.

The primary attention during monitoring and supervision activities was focused on availability in the organizations, involved in mining of minerals or those organizations that use the subsoil for the purposes other than mining, of:

licenses for using the subsoil, licenses for survey activities;

specified geological survey documentation and the quality of its preparation;

design documentation for mining of mineral deposits and mining development plans for the current period approved in accordance with the established procedure;

documents certifying refined boundaries of mining allotments;

survey observations of rock and earth surface movement, manifestations of geological

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deformation processes;

equipment in survey services;

accomplished measures for protection of buildings, engineering structures and natural objects against adverse impact of mining;

monitoring of elimination (mothballing) of facilities involved in mining of minerals.

In 2013, 1,397 examinations were conducted, 3,747 violations of the requirements to survey support of mining activities were revealed, 650 administrative penalties were imposed for failure to observe specified requirements for survey activities and safe conduct of mining works, fines amounting to a total sum of 41,034 thousand rubles were imposed.

Rostekhnadzor regional bodies reviewed 3,863 materials on mining activities development plans, 734 design documents for conducting survey activities, 2,281 mining allotment projects, 1,345 materials for elimination (mothballing) of facilities associated with subsoil use including elimination (mothballing) of wells (oil and gas, exploratory, observation and other wells).

Rostekhnadzor reviewed 464 applications for issuance and renewal of licenses for survey activities.

The checks of supervised organizations and of facilities using the subsoil were conducted in accordance with the approved plan of inspections.

The checks of the compliance with the established requirements to survey support of mining activities and safe use of the subsoil were, as a rule, conducted within the frameworks of scheduled comprehensive checks of supervised organizations using all kinds of supervision with the issue of unified inspection report.

It shall be noted that measures to monitor activities in hazardous areas of JCS Uralkaliy are annually excluded by the Prosecutor-General's Office of the Russian Federation in the Privolzhskiy Federal District from the draft inspection plan of the Western Urals Department, in spite of the fact that Rostekhnadzor was charged with continuous supervision over comprehensive monitoring by JCS Uralkaliy of the situation associated with emergency flooding of BKPRU-1 pit by the Governmental Commission for preventing negative consequences of the technogenic accident caused by flooding of JCS Uralkaliy BKPRU-1 pit of the Upper Kama potassium-magnesium salt deposit in Berezniki (the Perm Territory). Until now, the consequences of the accident in the mentioned pit have not been eliminated.

As a result of the checks legal entities and officials of the organizations were brought to administrative responsibility in accordance with articles 7.2, 8.10, 9.1, 19.5 of the Code of the Russian Federation "On Administrative Offenses."

Analysis of revealed violations of the requirements for safe execution of mining activities indicated that the most typical of them are the following ones:

deviations from approved design documentation for utilization of the subsoil;

deviations from envisaged mining development plans while conducting mining activities;

absence of design, technical, and authorizing documentation at low-capacity pits;

violations of established requirements for surveys while conducting survey activities.

Analysis of performing the state function of licensing the survey activities, and of the results of survey activity supervision pointed out the most typical violations of license requirements and conditions, which include:

violation of the procedure for certification of experts in the sphere of survey support of mining activities;

failure to observe the specified periodicity of refresher training by the experts of survey services.

The primary causes of violations of the requirements established in the field of safe conduct of the subsoil utilization activities and survey operations are the following:

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tardy accomplishment of scheduled measures for safe conduct of mining activities;  
insufficient qualification level of the specialists in the enterprises;  
reduction of the survey and geological services staff;  
lack or shortage of qualified specialists in the field of mining, surveyors, geologists;  
absence of geological services in a number of enterprises engaged in mining and processing of common minerals, hydromineral raw material.

Long-standing shortage of personnel in mining organizations continues to be an acute problem for assurance of efficient utilization of the subsoil and compliance with the regulatory requirements during surveys.

The general condition of survey support of mining activities, excluding the mining of common minerals, is satisfactory. The specialists of geological and survey services of the enterprises and of specialized organizations participate in assurance of safe work of enterprises aimed at prevention of incidents, accidents and injuries.

Supervised organizations accomplish the required scope of surveys by means of their own geological and survey services or contracted specialized organizations.

In accordance with the requirements of the Instruction for Conducting Survey Activities, the mining enterprises carry out works aimed at establishment and development of survey control networks and surveying substantiation in the necessary scope.

In the course of surveys, the mining enterprises increasingly resort to the use of electronic devices, modern software, which significantly improves the quality of works. Modern computer technologies were introduced (JCS GOTH, LLC NRGTS, JSC Volgo-geologiya, LLC RNIITs, LLC Peshelan gypsum plant Dekor-1 Volga-Oka Department).

As proposed by a number of regional bodies (Upper Don, Lena Departments), the enterprises promote training of their own personnel for staffing the survey services. Upon dedicated referral from the enterprises (Diamond-Mining Company Alrosa, JSC Olshansk Pit, JSC Podgorenskiy tsementnik) education in mine survey specialty is arranged in the institutes of higher education.

The formats of state statistical monitoring No. 70-tp, No. 71-tp, No. 5-gr, and No. 5-gr (coal) are filled in by the enterprises based on the data of geological and surveying records of production and losses of minerals, stock turnover.

According to the data of survey measurements, taxable basis is determined during calculation of mineral mining tax.

Analysis of the situation in survey support of mining activities demonstrates that a number of organizations supervised by Rostekhnadzor conducted survey activities with violations of the established requirements.

Typical violations:

instrumental surveys of in-quarry roads were not conducted (LLC Katrina, LLC Prospectors' Co-operative Tyva, JSC NPO Irion);

monitoring of side slope condition of the pits is not arranged (JSC NPO Irion, LLC Prospectors' co-operative Tyva);

reports on preparedness for works in hazardous zone and reports on striking the hazardous zone off the register were not documented, which violates the requirements for procedure and monitoring of safe conduct of mining activities in hazardous zones (JSC UK Razrez Stepnoi, JSC Razrez Izykhskiy);

logbooks of survey control network condition were not maintained (JSC Krasnoyarskgesstroi, JSC MKK - Sayanmramor);

safe custody and maintenance of survey documentation were not provided (LLC Chemtech-geologiya, LLC Prospectors' Co-operative Tyva).

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Survey activities in the enterprises with small mined rock output capacity were conducted on contractual basis by the organizations holding licenses for survey activities. At the same time, the quality of survey support of mining activities does not always satisfy the established requirements.

The Arbitrage of the Volgograd Region, upon the request of Lower Volga Department of Rostekhnadzor, revoked the license, earlier issued to JSC Volgogradneftegazstroi for conducting survey activities, in view of failure to eliminate, by the time specified, gross violations of license requirements and conditions during survey activities indicated in a number of orders. The license for conducting survey activities issued to individual entrepreneur A.Kuznetsov was revoked (Yenisey Department).

Due to non-compliance of license applicants with license requirements and conditions defined in the Provision on Licensing Survey Activities, approved by the Decree of the Government of the Russian Federation No. 257 of March 28, 2012, granting of the license was rejected on account of the absence in the applicant's staff of the employees trained in the specialty "mine survey" or those with higher professional education and professional retraining for qualification in the mentioned specialty (LLC Construction Company L-Stroi, JSC Aviation and Applied Ecology, LLC Nafta-Grupp, LLC Pokhvistnevo Municipal Real Estate Center).

Analysis of the results of monitoring and supervisory measures for verifying the compliance by the enterprises utilizing the subsoil with the requirements to mining activities demonstrated that, on the whole, mining activities are carried out in accordance with the requirements of properly approved basic designs, mining development plans (schemes) and other process documentation.

In some cases, deviations from the design documentation during establishment of coal-storage yards in the process of mining activities were observed (LLC SUEK-Khakassia Khakassia mine).

Deviations from the design documentation pertaining to observance of mining development plans and of safe parameters of the benches were revealed in mining activities of LLC Carbonate, LLC Topaz, LLC Smolensk Pit Department (Central Department).

Administrative penalties were imposed on the violators in accordance with part 2 of article 7.3 of the Code on Administrative Offenses.

In 2013, the analysis of the results of the review of annual mining development plans indicated that in some cases the parameters of mining activities did not comply with the design solutions pertaining to consistency of the directions of the mining activity front, fulfillment of calendar plans of stripping and mining works, provision with resources ready for recovery, condition of pit dumps and walls, use of technical devices envisaged in the design solutions. The quality of preparation of mining graphical documentation and its compliance with the established requirements is inadequate.

Mining allotment documentation is prepared with violations. During the review of mining allotment projects, the state mining supervision bodies note that in most cases the projects do not contain sufficient substantiation of refined mining allotment boundaries, and graphic materials are submitted without taking into account the actual state of mining activities.

On account of the unavailability of the design documentation for mining of mineral deposits, mine allotment documentation was not issued to LLC Dragmet, SUE of the Republic of Khakassia Shirinskoye Road Repair and Construction Management, SUE of the Republic of Khakassia Ordjonikidzevskoye Road Repair and Construction Management.

Liquidation of facilities associated with the utilization of the subsoil is accomplished in compliance with properly approved projects which were approved in accordance with the established procedure and received positive conclusions of the industrial safety review.



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In Korkinskaya coal mine of Chelyabinsk Coal-Mining Company, technical works in the framework of the mine conservation were completed in accordance with the design solutions. Conservation of deep-mined alluvial gold deposit "Kongo" was accomplished (North-Western Department).

The Lena Department conducted four unscheduled checks to verify the observance of industrial safety requirements during conservation (liquidation) of hazardous industrial facilities in JSC Pobeda LLC Sever, JSC Sakhazoloto, LLC Sakha - Vostock.

At the same time, the coal mines in the Rostov and Kemerovo Regions, subject to liquidation in accordance with the decisions taken, have not, so far, been liquidated in accordance with the procedure established by the legislation on the subsoil.

In the territory of the Rostov Region (Northern Caucasus Department) 48 mines are at the stage of liquidation, including 26 mines of JSC Rostovugol, 10 mines of JSC Gukovugol, and 12 mines of JSC Shakhtugol. In all mines that are at the stage of liquidation, all mine workings were completely abandoned, excluding the mines, where mine workings are used for drainage systems, however, liquidation statements were not signed for any of the coal-mining enterprises subject to liquidation.

Yeniseiskaya mine (Yenisei Department) is in the process of self-liquidation. Mining activities in the mine were terminated in 2010. The project for liquidation of hazardous industrial facility was not developed, as of today flooding of the mine continues, water level as of 20.12.2013 was at the mark — 264.1 m.

For failure to fulfill the requirements for bringing of liquidated or conserved mine workings into the condition assuring population and the environment safety, administrative penalties were imposed on the violators in accordance with part 2 of article 8.10 of the Code of the Russian Federation "On Administrative Offenses."

### *2.2.9 Facilities of Oil and Gas Producing Industry*

According to the reports of Rostekhnadzor regional departments, the number of supervised organizations operating hazardous industrial facilities in oil and gas producing industry amounts to 1,501. 6,144 hazardous industrial facilities in oil and gas producing industry are included in the State Register, including: 214 drilling operation sites; 2,040 well stocks; 343 preliminary oil treatment sites; 812 sites of booster pump stations and pumping stations; 499 oil treatment and gathering points; 104 tank farms, 1,781 systems of field (field-to-field) deposit pipelines having the length of 261,786.79 km, 92 field compressor stations; 221 integrated gas treatment facilities; 7 stationary offshore platforms, 4 floating drilling vessels.

During 2013, 18 accidents happened in oil and gas producing industry HIFs; in 2012, the number of accidents was the same - 18 (Table 50).

The total material damage incurred by the accidents amounted to 2,951.877 million rubles.

In 2013, 8,157 incidents occurred in oil and gas producing facilities which is 3.4% more than in 2012 (7,877), including 8,121 failures of technical devices (7,839 failures - in 2012), 36 deviations from the process conditions (38 deviations - in 2012).

In 2013, the fatal injury rate decreased in comparison with 2012. 18 fatal injuries were registered (in 2012 - 19 cases), see Table 51.

As compared to 2012, the number of group casualty incidents in the reporting period of 2013 increased from 3 to 6. The total number of persons injured in group casualty incidents increased from 52 to 55, while the number of fatalities decreased from 19 to 18 persons.

## Distribution of accidents among industry branches

*Table 50*

	2013	2012
Oil production	16	16
Gas production	2	2
<b>Total:</b>	<b>18</b>	<b>18</b>

*Table 51*

## Distribution of fatalities among industry branches

	2013	2012
Oil production	18	18
Gas production	0	1
<b>Total:</b>	<b>18</b>	<b>19</b>

In 2013, the number of fatalities in hazardous industrial facilities of gas production branch decreased (–1) as compared to 2012, and the number of fatalities in oil production facilities remained the same (Table 52).

*Table 52*

## Breakdown of accidents by their types in oil-and-gas production facilities

Types of Accidents	Number of accidents				
	2013		2012		+/-
		%		%	
Open blows and blowouts	4	22	9	50	-5
Explosions and fires at the facilities	2	12	2	11	0
Falling of oil (operation) derricks, destruction of their parts	2	11	0	0	+2
Falling of block-and-tackle systems during deep drilling and underground well repairs	0		1	5	-1
Other	10	55	6	34	+4
<b>Total:</b>	<b>18</b>		<b>18</b>		<b>0</b>

According to the results of accident rate analysis (Table 51), it was determined that 22 % of all accidents that occurred in 2013 are associated with open blows and blowouts, the share of which, as compared to 2012, decreased by 28 %. The number accidents caused by explosions and fires increased, and their share increased from 11 % to 12 %. The number of accidents associated with falls of oil derricks increased by 11 %. The number of other accidents (destruction of technical devices, spills) increased by 21 % as compared to 2012, and amounted to 55 % of the total number of accidents.

Technical investigation of the causes of accidents indicates that equipment wear (50 % of accidents) is one of the primary risk factors affecting the state of industrial safety of HIFs, initiation of failures, pipeline seal failure leading to oil spills, explosions and destructions. 34 % of the total number of accidents occurred during well-drilling and workover operations, 11 % - during repair work, 5 % - during operation of pump stations.

Table 53

**Breakdown of fatalities by injury factors in oil-and-gas production facilities  
in 2012 and 2013**

Injury factors	Number of fatalities				
	2013		2012		+/-
		%		%	
Thermal impact	1	5.5	1	5.3	0
Height	3	16.7	7	36.8	-4
Toxic agents	—	—	4	21.1	-4
Blast wave	1	5.5	—	—	+1
Destructed technical devices	3	16.7	2	10.5	-1
Electric shock	1	5.5	—	—	+1
Other	9	55.6	5	26.3	+4
<b>Total:</b>	<b>18</b>	<b>100</b>	<b>19</b>	<b>100</b>	<b>-1</b>

In 2013, three persons (16.7 %) died as a result of craniocerebral injuries, caused by falling from height, three persons were fatally injured as a result of destruction of technical devices (16.7 %), one died of electrical shock (5.5 %), and one each were fatally injured by blast wave (5.5 %) and thermal impact (5.5 %). Nine persons (44.4 %) died as a result of injuries caused by moving parts of mechanisms and during load handling operations (Table 53).

The data on distribution of accidents and fatalities in 2013 and 2012 among the subjects of the Russian Federation and Rostekhnadzor regional bodies are presented in Tables 54 and 55 correspondingly.

Table 54

**Distribution of accidents and fatalities in 2013 and 2012 among the subjects of  
the Russian Federation**

Federal districts of the Russian Federation (regional bodies of Rostekhnadzor)	Accidents			Fatalities		
	2012	2013	+/-	2012	2013	+/-
<b>North-Western Federal District (Saint-Petersburg)</b>	<b>7</b>	<b>9</b>	<b>+2</b>	<b>1</b>	<b>1</b>	<b>0</b>
The Nenets Autonomous Area	2	1	-1	—	1	+1
The Komi Republic	5	8	+3	1	—	-1
<b>Southern Federal District (Rostov-on-the-Don)</b>	<b>—</b>	<b>1</b>	<b>+1</b>	<b>—</b>	<b>—</b>	<b>—</b>
The Krasnodar Territory	—	1	+1	—	—	—
<b>Northern Caucasus Federal District (Pyatigorsk)</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>—</b>	<b>—</b>	<b>—</b>
The Chechen Republic	1	—	-1	—	—	—
<b>Privolzhskiy Federal District (Nizhniy Novgorod)</b>	<b>3</b>	<b>—</b>	<b>-3</b>	<b>7</b>	<b>5</b>	<b>-2</b>
The Perm Territory	1	—	-1	1	2	+1
The Republic of Bashkortostan	—	—	—	4	1	-3
The Republic of Tatarstan	1	—	—	1	2	+1
The Saratov Region	1	—	-1	1	—	-1

Federal districts of the Russian Federation (regional bodies of Rostekhnadzor)	Accidents			Fatalities		
	2012	2013	+/-	2012	2013	+/-
<b>The Urals Federal District (Yekaterinburg)</b>	<b>7</b>	<b>7</b>	<b>—</b>	<b>11</b>	<b>11</b>	<b>—</b>
The Khanty-Mansi Autonomous Area	6	3	-3	9	6	-3
The Yamalo-Nenets Autonomous Area	1	4	+3	2	5	+3
<b>Far East Federal District (Khabarovsk)</b>	<b>—</b>	<b>1</b>	<b>+1</b>	<b>—</b>	<b>1</b>	<b>+1</b>
The Republic of Sakha (Yakutia)	—	1	+1	—	—	—
The Sakhalin Region	—	—	—	—	1	+1
<b>Total in Russia:</b>	<b>18</b>	<b>18</b>	<b>—</b>	<b>19</b>	<b>18</b>	<b>-1</b>

*Table 55*

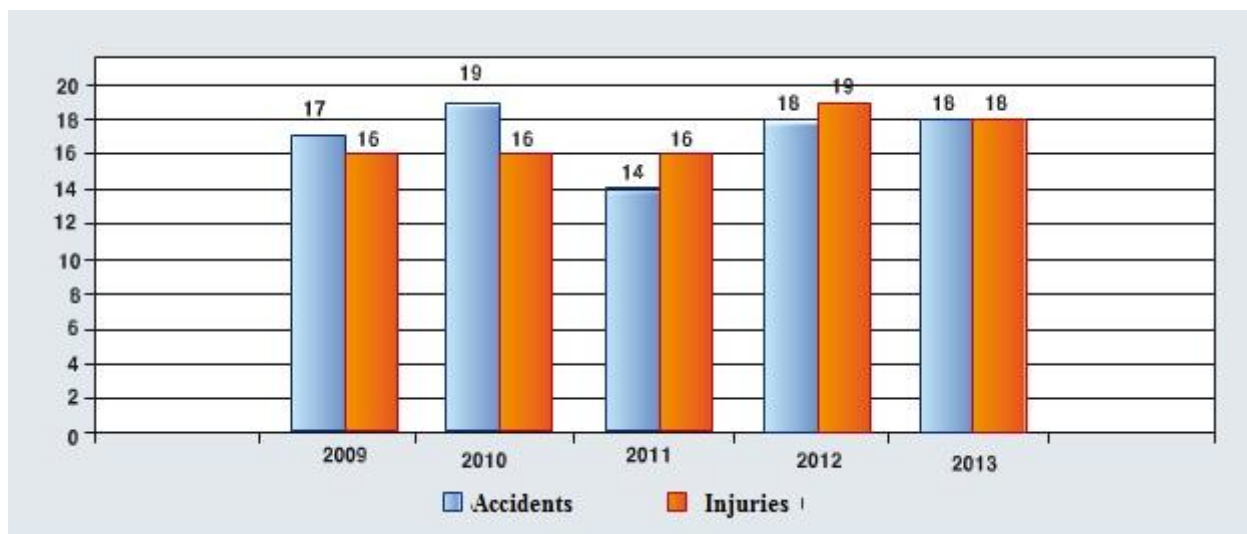
**Distribution of Accidents and Fatal Injury Cases among Rostekhnadzor  
Territorial Bodies**

Federal districts of the Russian Federation (regional bodies of Rostekhnadzor)	Accidents			Fatalities		
	2012	2013	+/-	2012	2013	+/-
<b>Central Federal District (Moscow)</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>—</b>	<b>1</b>	<b>+1</b>
<b>Interregional Technological Department</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>—</b>	<b>1</b>	<b>+1</b>
<b>North-Western Federal District (Saint-Petersburg)</b>	<b>7</b>	<b>9</b>	<b>+2</b>	<b>1</b>	<b>1</b>	<b>—</b>
<b>Pechora Department</b>	<b>7</b>	<b>9</b>	<b>+2</b>	<b>1</b>	<b>1</b>	<b>—</b>
<b>Southern Federal District (Rostov-on-the-Don)</b>	<b>—</b>	<b>1</b>	<b>+1</b>	<b>1</b>	<b>—</b>	<b>-1</b>
<b>Northern Caucasus Department</b>	<b>—</b>	<b>1</b>	<b>+1</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>Lower Volga Department (Volgograd)</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1</b>	<b>—</b>	<b>-1</b>
<b>Privolzhskiy Federal District (Nizhniy Novgorod)</b>	<b>3</b>	<b>—</b>	<b>-3</b>	<b>6</b>	<b>5</b>	<b>-1</b>
<b>Western Urals Department</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>5</b>	<b>3</b>	<b>-2</b>
<b>Volga Department</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>1</b>	<b>2</b>	<b>+1</b>
<b>Middle Volga Department</b>	<b>1</b>	<b>—</b>	<b>-1</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>The Urals Federal District (Yekaterinburg)</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>11</b>	<b>10</b>	<b>-1</b>
<b>Northern Urals Department</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>11</b>	<b>10</b>	<b>-1</b>
<b>Far East Federal District (Khabarovsk)</b>	<b>—</b>	<b>1</b>	<b>+1</b>	<b>—</b>	<b>1</b>	<b>+1</b>
<b>Sakhalin Department</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1</b>	<b>+1</b>
<b>Lena Department</b>	<b>—</b>	<b>1</b>	<b>+1</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>Total in Russia:</b>	<b>18</b>	<b>18</b>	<b>—</b>	<b>19</b>	<b>18</b>	<b>-1</b>

In 2013, accidents occurred in hazardous industrial facilities supervised by Pechora (9),

Northern Urals (7), Northern Caucasus (1) and Lena Departments of Rostekhnadzor.

In 2013, fatalities were registered in hazardous industrial facilities supervised by Northern Urals (10), Western Urals (3), Volga (2), Interregional Technological (1), Pechora (1), and Sakhalin (1) Departments of Rostekhnadzor.



**Fig. 10.** The dynamics of accident and injury rates in 2009 - 2013

Analysis of the results of investigations of technical causes of the accidents in 2013 demonstrated that 8 accidents out of 18 (44 %) were caused by loss of sealing of field-to-field pipelines (LLC LUKOIL-Komi — TPE LUKOIL–Usinskneftegaz — 4 accidents, LLC LUKOIL-Komi — TPE LUKOIL–Ukhtaneftegaz — 3 accidents, LLC JC RUSVIETPETRO — 1 accident). The number of accidents caused by loss of sealing of field-to-field pipelines in 2012 was 7 out of 18 (39 %).

Major accidents in terms of inflicted environmental damage occurred in subsidiaries of JSC OC LUKOIL: LLC LUKOIL-Komi. Seven accidents were registered. The most severe of them was the accident that occurred on May 6, 2013 in oil and gas pipeline section from station ZU-24 to 159 mm diameter 6 mm wall thickness cut-in of the pipe from integrated oil and gas production shop No.4 (KTsDNG-4) of Vozeyskoye oil field in LUKOIL-Komi — TPE LUKOIL–Usinskneftegaz. Technical cause of the accident - initiation and development of pipeline wall failure in the form of large cavities and round-shape through holes in the flaw of operational origin - significant mechanical damage caused by violation of the technique for assembly of press-fit connection of 159 mm diameter 6 mm wall thickness pipe with the sleeve in the process of assembly of the pipeline section.

Organizational cause of the accident was failure to take urgent measures to prevent the ingress of oil-containing fluid into water bodies, as well as violations of the requirements of the environmental protection legislation pertaining to arrangement of oil outflow elimination activities, as well as insufficient production supervision over observation of industrial safety requirements during operation of the pipeline and over observation of the environmental protection legislation on the part of TPE LUKOIL–Usinskneftegaz persons responsible. The ecological damage incurred by the accident amounted to 5466 thousand rubles.

Another major accident occurred on March 13, 2013 at Yamal Gas Field Department of LLC Gazpromdobycha Nadym of JSC Gazprom. During air-gas mixture drive from 1.8 and 1.9 process lines into cold vent, process pipelines adjoining with the discharge system in the gas treatment process vessel No.4 of integrated gas treatment facility in gas field GP-2 of



Bovanenkovo oil and gas condensate deposit were not disconnected. Generation of gas-air mixture in the gas treatment process vessel led to the explosion. Technical cause of the accident - generation of gas-air mixture in the gas treatment process vessel as a result of the ingress of natural gas from the discharge system through the cold vent tap and the air vent valve. Organizational cause of the accident - the conduct of gas-hazardous works by a single worker without the issue of job order-authorization, without scheduling the appropriate preparatory actions and verification of fulfillment thereof. The damage incurred by the accident amounted to 2,166,999.7 thousand rubles.

A major accident occurred on May 15, 2013 in LLC RN-Krasnodarneftegaz in well No.249 of Aanasievsko-troitskoe deposit in the Krasnodar Territory, where in the process of well springing and blasting operation the gas and oil blowout happened. Technical causes of the accident - loss of sealing of the kill line between the wellhead control valve and Xmas-tree cross-member followed by destruction of their casings during the closure of end gate valve mounted on the choke manifold. Organizational causes of the accident - improper conduct of works and unsatisfactory production control on the part of JSC Krasnodarneftegeofizika and LLC Krasnodarneftegaz Remont servicing organizations.

In 2013, the supervisory activities and monitoring activities of Rostekhnadzor regional bodies and headquarters were based on the provisions of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia Plan for Scheduled Inspections of Legal Entities and Individual Entrepreneurs for 2013.

In 2013, Rostekhnadzor regional bodies conducted 2,249 (in 2012 – 2,165) checks of fulfillment of industrial safety requirements during operation of oil and gas production facilities, in the course of which 10,605 (in 2012. — 10,122) violations of industrial safety requirements were revealed. The total number of administrative penalties imposed as a result of the checks amounted to 1,027 (in 2012 — 1,141). The total sum of the fines imposed amounted to 56,870 thousand rubles (in 2012 — 62,834.5 thousand rubles), including 40,819 thousand rubles in fines imposed on legal entities, and 15,948 thousand rubles - on the officials.

In accordance with the Federal Environmental, Industrial and Nuclear Supervision Service of Russia Plan for Scheduled Inspections of Legal Entities and Individual Entrepreneurs for 2013, on the Order of Rostekhnadzor No.61-rp of May 15, 2013, "On conducting scheduled field inspection of JSC Tatneft named after V.D. Shashin (TIN 1644003838)," inspections of JSC Tatneft named after V.D. Shashin and of hazardous industrial facilities of the Company.

In the course of inspections, 795 violations of the requirements of regulatory legal acts and regulatory technical documents during operation of hazardous industrial facilities, in oil and gas production facilities in operation at Tatneftegazpererabotka Management, Yelkhovneft OGPM, Almetievneft OGPM, and Bavlyneft OGPM were revealed.

The primary violations: malfunction of technical devices during operation, insufficient effectiveness of production control, insufficient provision of hazardous industrial facilities with production processes monitoring equipment and systems.

65 officials were brought to administrative responsibility for violations of the law; the total sum of fines amounted to 1,452 thousand rubles.

In 2013, Rostekhnadzor reviewed and registered 138 declarations of industrial safety, 50,717 industrial safety review reports (12.6 % more than in 2012 - 45,060), including: on documentation – 4,553 (8.9 % of the total number of review reports); on technical devices — 43,316 (85.4 %); on buildings and engineering structures — 1,867 (3.7 %); on declarations of

safety — 138 (0.3 %); on operating documentation — 843 (1.7 %).

2018 industrial safety review reports were not approved (3.9 % of the registered ones).

The grounds for refusal to approve the industrial safety review reports are related to violation of the review procedure, including non-compliance with the requirements to the format of industrial safety review report, non-compliance of the scope of expert examination with the program for expert activities, lack of substantiation for conducting the review of design documentation on modernization of hazardous industrial facilities, assessment of the substantiation of accepted design solutions, substantiation for declaring hazardous industrial facilities.

An important direction of control of industrial safety of hazardous industrial facilities is effective arrangement of production control service.

Production control services were created in 557 out of 1,501 organizations operating hazardous industrial facilities, in the remaining organizations, in accordance with the requirements of the "Regulations for Arranging and Exercising Production Control of Observation of the Industrial Safety Requirements in Hazardous Industrial Facility," approved by the Decree of the Government of the Russian Federation No.263 of March 10, 1999, "On Arrangement and Exercising of Production Control of Observance of the Industrial Safety Requirements in Hazardous Industrial Facility," (with amendments as of June 21, 2013), officials responsible for exercising production control were appointed.

Production control bodies of the organizations developed 28,483 measures aimed at assurance of industrial safety of hazardous industrial facilities.

As a result of the checks conducted, the following drawbacks were revealed:

in certain organizations the condition of production control is not analyzed;

inspection plans are not developed;

supervision over timely accomplishment of diagnostics and required tests of technical devices used in hazardous industrial facilities is not exercised;

supervision over meeting the deadlines for fulfillment of orders and submission of notifications of fulfillment thereof is not exercised.

The main reiterated violations of the Regulations for Arranging and Exercising Production Control of Observation of the Industrial Safety Requirements in Hazardous Industrial Facility are:

failure of the employees of the enterprises to perform their functions specified in the Provision on Production Control;

failure to timely submit the information on arrangement and exercising of production control to Rostekhnadzor regional departments.

The state of industrial safety of hazardous industrial facilities is affected by the arrangement and conduct of the checks of fulfillment of license requirements and conditions.

In 2013, the regional bodies conducted 98 checks (in 2012 - 107 checks) of license requirements and conditions. 88 licenses were granted as a result of the checks. The issue of licenses was rejected to 10 organizations (in 2012 - 17). 445 violations of the license requirements and conditions were revealed and orders for elimination thereof issued. Thus, due to the absence of a positive conclusion of industrial safety review for technical devices used in hazardous industrial facility, non-observance of the procedure for training and qualification of industrial safety specialists and of the agreement for rendering services by professional emergency rescue units, the issue of licenses was rejected to LLC NITs Technoleader, LLC SYaD, LLC Tagulskoye, LLC NOTs BTd, LLC Service-Grupp, LLC IPEK, Fund IDFM, LLC Globalstroengineering, LLC Yargeo, FAE Russian Maritime Register of Shipping.

At the same time, no gross violations of the license requirements and conditions leading to administrative suspension of the activity were revealed.

28 employees of the organizations were brought to administrative responsibility for violations of license requirements and conditions and the sum of fines imposed on them amounted to 1,044 thousand rubles.

During the checks of supervised enterprises, their readiness for elimination and localization of the consequences of accidents was also assessed, that is one of the primary tasks, the solution of which affects the scale and severity of the consequences of industrial accidents.

Supervised enterprises operating oil and gas producing hazardous industrial facilities create their own emergency rescue units or conclude contracts for services with professional emergency rescue units.

Interaction with regional Emergency Management Commissions on the issues of fulfillment of organizational and technical provisions for accident prevention, enhancement of safety of engineering and technical systems and structures in hazardous industrial facilities, assurance of stability and safety of functioning of supervised facilities in emergency situations is envisaged in oil and oil product outflow localization and elimination plans (OPOLEP) and accident localization and elimination plans (ALEP) that are available at the enterprises.

Available OPOLEPs and ALEPs contain information on creating material and financial reserves at the enterprises for taking measures to prevent and eliminate emergencies, on personnel actions during accident initiation and development, on preparedness for accident localization and elimination actions and rescue of people.

Practically at all enterprises the schedules of studies and drills for the personnel involved in the actions of emergency rescue unit are available.

The facilities have the means of annunciation, alarms (sound and light), communications (local, urban and cellular communication network telephones) and emergency protection (according to adopted design solutions) for actions in the event of accidents.

At the same time, there are cases of formal and negligent attitude of the enterprises towards scheduling studies and drills with the personnel (LLC Bashneft Polyus in the Nenets Autonomous Area, LLC Tagulskoye in the Krasnoyarsk Territory), incomplete provision of in-house emergency rescue units with necessary individual protection means and material resources for accident localization and elimination.

In addition, professional emergency rescue units are faced with the problem of geographical remoteness and hard accessibility of certain enterprises, and lack of state control of their readiness.

Taking into account the climatic and territorial features of the Tyumen Region, vast areas and unavailability of constant communication between settlements, the activity of professional emergency rescue units frequently has a formal character, particularly, this trend manifests itself in is the Khanty-Mansi Autonomous Area - Yugra and in the Yamalo-Nenets Autonomous Area, where professional emergency rescue units responsible for elimination of oil and oil product outflows are stationed in the towns of Nyagan (Talinskoye deposit), Khanty-Mansiysk, Nizhnevartovsk, Surgut, while hazardous industrial facilities are located at a distance of 300 km and more from the bases of emergency rescue units.

### 2.2.10. Petrochemical, Oil and Gas Refining Industry Facilities, and Petroleum Product Supply Facilities

According to the reports of Rostekhnadzor regional bodies, as of 2013, registered in the state register of hazardous industrial facilities were 7,363 HIFs of oil and gas refining, petrochemical industry and petroleum product supply facilities operated by 4,623 organization, including 561 HIFs operated by 195 petrochemical industry organizations; 712 HIFs operated by 270 oil and gas refining industry organizations; 5,888 petroleum product supply HIFs including 1,481 petroleum storage depots, 2,879 fuel and lubricant warehouses, 1,354 gasoline filling stations, tank stations and oil-handling facilities operated by 3,801 petroleum product supply organizations.

In 2013, 14 accidents occurred in the HIFs of petrochemical, oil and gas refining industry and petroleum product supply facilities, which is four accidents less than in 2012 (Table 56).

The total material damage incurred by the accidents amounted to 552.6 million rubles.

In 2013, fatal injury rate decreased significantly as compared to 2012. For fatalities were registered, in 2012 - 13 cases (Table 57).

In the reporting period of 2013, the number of group casualties decreased from 7 cases (in 2012) to 1 case. The total number of individuals injured in group casualty cases decreased from 18 to 3 persons, and the number of fatalities decreased from 7 to 1.

**Table 56**

#### **Distribution of accidents among industry branches**

<b>Industry branches</b>	<b>2013</b>	<b>2012</b>
Oil and gas refining facilities	8	11
Petrochemical production facilities	1	3
Petroleum product supply facilities	5	4
<b>Total:</b>	<b>14</b>	<b>18</b>

In 2013, the number of accidents decreased in the HIFs in oil and gas refining industry (–3) and petrochemical industry (–2), and increased in petroleum product supply facilities (+1) (Table 56).

**Table 57**

#### **Distribution of fatalities among industry branches**

<b>Industry branches</b>	<b>2013</b>	<b>2012</b>
Oil and gas refining facilities	3	7
Petrochemical production facilities	1	2
Petroleum product supply facilities		4
<b>Total:</b>	<b>4</b>	<b>13</b>

In 2013, the number of fatalities decreased in the hazardous industrial facilities in oil and gas refining industry (–4) and petrochemical industry (–1), and no fatalities were registered in petroleum product supply facilities (Table 57).

Table 58

**Breakdown of accidents by their types among petrochemical, oil and gas refining industry facilities, and petroleum product supply facilities**

Types of accidents	Number of accidents				
	2013		2012		+/-
		%		%	
Explosion	3	21	6	33	-3
Fire	6	43	5	28	+1
Discharge of hazardous substances	5	36	7	39	-2
<b>Total:</b>	<b>14</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>-4</b>

According to the analysis conducted (Table 58), 21 % out of the total number of accidents that occurred in 2013 were associated with explosions, the share of which, as compared to 2012, decreased by 12 %. The number of "Fire" type of accidents rose, the share of them increased from 28 % to 43 %. The number of accidents associated with discharges of hazardous substances, the share of which in the total number of all types of accidents amounted to 36 %, which is 3 % less than in 2012.

Table 59

**Breakdown of fatalities by injury factors at petrochemical, oil and gas refining industry facilities, and petroleum product supply facilities**

Injury factors	Number of fatalities				
	2013		2012		+/-
		%		%	
Thermal impact	1	25	3	23	-2
Lack of oxygen	—	—	9	69	-9
Blast wave	—	—	1	8	-1
Destructed technical devices	3	75	—	—	+3
<b>Total:</b>	<b>4</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>-9</b>

The injury factor of two fatalities (75 %) was craniocerebral trauma caused by destruction of equipment, and of one fatality - thermal impact (Table 59).

Distribution of accidents and fatalities in 2013 and 2012 among the subjects of the Russian Federation and Rostekhnadzor regional bodies is presented in Tables 60 and 61 correspondingly.



Table 60

**Distribution of accidents and fatalities in 2013 and 2012 among the subjects of  
the Russian Federation**

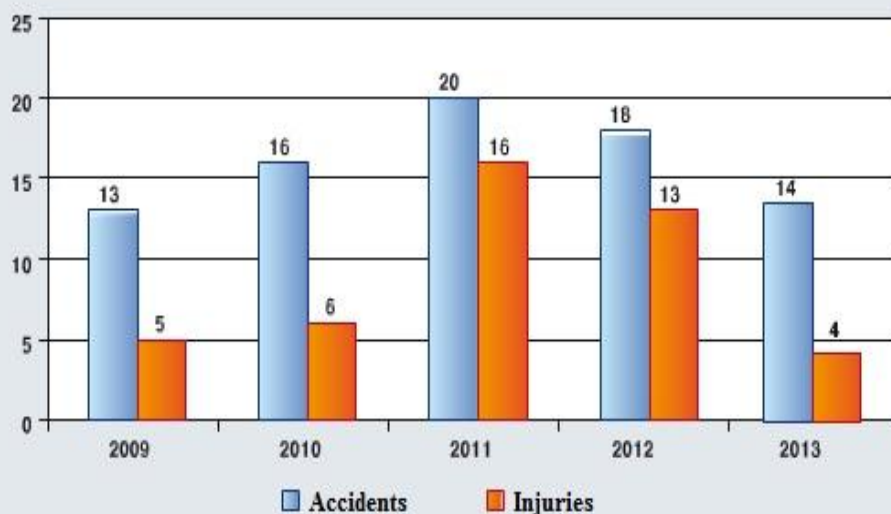
Federal districts of the Russian Federation (regional bodies of Rostekhnadzor)	Accidents			Fatalities		
	2012	2013	+/-	2012	2013	+/-
<b>Central Federal District (Moscow)</b>	<b>4</b>	<b>—</b>	<b>-4</b>	<b>1</b>	<b>—</b>	<b>-1</b>
The Voronezh Region;	—	—	—	1	—	-1
Moscow;	1	—	-1	—	—	—
The Ryazan Region	3	—	-3	—	—	—
<b>North-Western Federal District (Saint-Petersburg)</b>	<b>1</b>	<b>1</b>	<b>—</b>	<b>1</b>	<b>—</b>	<b>-1</b>
The Leningrad Region;	1	1	—	1	—	-1
The Komi Republic	—	—	—	—	—	—
<b>Southern Federal District (Rostov-on-the-Don)</b>	<b>—</b>	<b>3</b>	<b>+3</b>	<b>—</b>	<b>1</b>	<b>+1</b>
The Krasnodar Territory;	—	2	+2	—	1	+1
The Rostov Region	—	1	+1	—	—	—
<b>Privolzhskiy Federal District (Nizhniy Novgorod)</b>	<b>7</b>	<b>6</b>	<b>-1</b>	<b>8</b>	<b>1</b>	<b>-7</b>
The Kirov Region;	—	—	-1	1	—	-1
The Nizhni Novgorod Region;	1	—	—	—	—	—
The Perm Territory;	1	1	—	1	—	-1
The Republic of Bashkortostan;	2	2	—	5	—	-5
The Samara Region;	2	3	+1	—	+1	+1
The Saratov Region	1	—	-1	1	—	-1
<b>The Urals Federal District (Yekaterinburg)</b>	<b>2</b>	<b>1</b>	<b>-1</b>	<b>1</b>	<b>1</b>	<b>—</b>
The Sverdlovsk Region;	1	—	-1	1	—	-1
The Khanty-Mansi Autonomous Area	1	1	—	—	1	+1
<b>Siberian Federal District (Novosibirsk)</b>	<b>4</b>	<b>1</b>	<b>-3</b>	<b>2</b>	<b>1</b>	<b>-1</b>
The Irkutsk Region;	2	1	-1	2	—	-2
The Krasnoyarsk Territory;	2	—	-2	—	1	+1
The Omsk Region	—	—	—	—	—	—
<b>Far East Federal District (Khabarovsk)</b>	<b>—</b>	<b>2</b>	<b>+2</b>	<b>—</b>	<b>—</b>	<b>—</b>
The Khabarovsk Territory;	—	1	+1	—	—	—
The Republic of Sakha (Yakutia)	—	1	+1	—	—	—
<b>Total in Russia:</b>	<b>18</b>	<b>14</b>	<b>-4</b>	<b>13</b>	<b>4</b>	<b>-9</b>

Table61

## Distribution of accidents and fatalities among Rostekhnadzor regional bodies

Federal districts of the Russian Federation (regional bodies of Rostekhnadzor)	Accidents			Fatalities		
	2012	2013	+/-	2012	2013	+/-
<b>Central Federal District (Moscow)</b>	<b>4</b>	<b>—</b>	<b>-4</b>	<b>1</b>	<b>—</b>	<b>-1</b>
Interregional Technological Department	1	—	-1	—	—	—
Upper Don Department	—	—	—	1	—	-1
Oka Department	3	—	-3	—	—	—
<b>North-Western Federal District (Saint-Petersburg)</b>	<b>1</b>	<b>1</b>	<b>—</b>	<b>1</b>	<b>—</b>	<b>-1</b>
North-Western Department	1	—	-1	1	—	-1
Pechora Department	—	1	+1	—	—	—
<b>Southern Federal District (Rostov-on-the-Don)</b>	<b>—</b>	<b>3</b>	<b>+3</b>	<b>1</b>	<b>1</b>	<b>—</b>
Lower Volga Department	—	—	—	1	—	-1
Northern Caucasus Department		2			1	
<b>Privolzhskiy Federal District (Nizhniy Novgorod)</b>	<b>6</b>	<b>6</b>	<b>—</b>	<b>7</b>	<b>1</b>	<b>-6</b>
Western Urals Department	3	3	—	7	1	-6
Middle Volga Department	2	3	+1	—	—	—
Volga-Oka Department	1					
<b>The Urals Federal District (Yekaterinburg)</b>	<b>3</b>	<b>1</b>	<b>-2</b>	<b>1</b>	<b>1</b>	<b>—</b>
Northern Urals Department	1	1	—	—	1	+1
Urals Department	1			1		
<b>Siberian Federal District (Novosibirsk)</b>	<b>4</b>	<b>1</b>	<b>-3</b>	<b>2</b>	<b>1</b>	<b>-1</b>
Siberian Department	—	—	—	—	1	+1
Yenisei Department	4	1	-3	2	—	-2
Trans-Baikal Department	—	—	—	—	—	—
<b>Far East Federal District (Khabarovsk)</b>	<b>0</b>	<b>2</b>	<b>+2</b>	<b>—</b>	<b>—</b>	<b>—</b>
Far East Department	—	1	+1	—	—	—
Lena Department	—	1	+1	—	—	—
<b>Total in Russia:</b>	<b>18</b>	<b>14</b>	<b>-4</b>	<b>13</b>	<b>4</b>	<b>-9</b>

The dynamics of accident and fatal injury rates in 2009-2012 in the HIFs of oil and gas refining, petrochemical industry and petroleum product supply facilities is presented in Figure 11.



**Figure 11.** The dynamics of accident and occupational injury rates in 2009 – 2013 in the hazardous industrial facilities of oil and gas refining, petrochemical industry and petroleum product supply facilities

Analysis of the results of investigation of the causes of the accidents that occurred in 2013 indicates that the majority of them - 43 % (6 out of 14 accidents) - were caused by failure and loss of sealing of technical devices, 21 % of the accidents (3 accidents) were caused by violation of the procedure for arranging and conducting repair and gas-hazardous works.

Imperfect production technology and design deficiencies of technical devices were the causes of 14 % of the accidents (2 accidents). Another 14 % of the accidents (2 accidents) were caused by violation of the process conditions and regulations for maintenance of technical devices.

One accident (7 % of the total number of accidents) was caused by violation of shunting operation procedure.

Accidents caused by failure and loss of sealing of technical devices took place in LLC RN-Komsomolskiy NPZ, JSC Otradnenskiy Gas Processing plant, JSC Gazpromneftekhim Salavat, JSC Syzranskiy NPZ, two accidents in JSC Yeisk Seaport.

In two cases, loss of sealing of technical devices was caused by corrosive wear and a flaw in the welded joint of the technical device. In three cases it was caused by installation of a technical device and its component inconsistent with the design and the standard for the article. In one case it was caused by overheating of the furnace coil due to uneven distribution of the product over the furnace streams and unavailability of devices for monitoring the product flow rate in the streams.

Among this type of accidents the most serious ones, by their consequences and economic damage, occurred in LLC RN-Komsomolskiy NPZ and JSC Yeisk Seaport.

Thus, **on February 26, 2013**, an accident occurred in the heating furnace of the distillate hydrotreatment installation in LLC RN-Komsomolskiy NPZ, which was caused by loss of sealing of the furnace coil due to overheating up to the temperature exceeding the rated value for 08H18N10T steel as a result of uneven distribution of the product over the furnace streams and unavailability of the system for monitoring the product flow rate in the streams, which was not envisaged in the design.

Material damage caused by the accident amounted to 437 thousand rubles.

On August 9 and September 2, 2013, two accidents occurred in JSC Yeisk Seaport as a result of loss of sealing of black oil transit pipeline in the yard of oil product temporary storage and

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transfer terminal.

**On August 9, 2013**, during black oil reloading from the tank farm into the tanker, the bellows expansion joint broke in the process black oil transit pipeline. Repair and restoration of the damaged process pipeline section was performed and the bellows expansion joint installed.

**On September 2, 2013**, in the process of continued operation of the black oil transit pipeline, new accident caused by the rupture of bellows expansion joint occurred.

Installation of the bellows expansion joint in the black oil transit pipeline was not envisaged in the design documentation, besides, the use of bellows expansion joints in black oil transit pipelines contradicts the manufacturer's operation documentation for the bellows expansion joint and the certificate data for the use of the technical device.

The damage caused by the accident amounted to 950 thousand rubles.

Violations of the procedure for arranging and conducting repair and gas-hazardous works became the causes of three accidents, one of which entailed a fatality (21 % of the total number of accidents), specifically:

**January 25, 2013** - an accident in the tank farm of petroleum storage depot of JSC Sakhaneftgazsbyt subsidiary of Yakutskaya Petroleum storage depot;

**May 27, 2013** - an accident in the tank farm of petroleum refinery belonging to JSC JSC Gazpromneftekhim Salavat;

**August 21, 2013** - an accident in commodity and raw material depot in JSC PC DITEKO.

Violations of the procedure for arranging and conducting repair and gas-hazardous works became the cause of a fatal incident that occurred on June 6, 2013 in JSC Gazpromneft - Omskiy NPZ with a flame cutting torch operator who participated in dismantling the pipe coil of the furnace of combined facility for black oil high-level processing.

In the process of cutting the pipe connecting the convective coil with the overhead coil, the latter fell down on flame cutting torch operators who were on the trestle and crushed the trestle down to the furnace bottom level. As a result of the fall one of the operators was jammed between the trestle bottom and the fallen coil pipe of the furnace. In addition, the open flame of the cutter ignited the heap of collapsed wooden floor boards of the trestle and the operator was fatally injured.

Imperfect production technology and design deficiencies of technical devices were the causes of two accidents (14 % of the total number of accidents), specifically:

**On June 2, 2013**, in the territory of Sulinskaya petroleum depot belonging to LLC LUKOIL-Nizhnevozhsknefteproduct, an accident entailing group casualties occurred during petroleum product loading into the tank truck. As a result of the accident the depot operator and truck drivers were injured, one of them died.

Following the investigation of causes of the accident, the commission found that the design of the vehicle was modified: a nozzle with a tap was installed in the front bottom part of the tank, the nozzle cutting-in was not authorized. As a result of this, during petroleum product loading into the tank truck, the fuel leaked from the tap or the hose connected with the nozzle with tap in the front section of the tank laid through the housing of socket couplers, impairing the housing leak tightness, which was followed by short circuit and sparking.

**On November 3, 2013**, during the start-up of redundant compressor line in Bakhilovo compressor station belonging to LLC Belozerniy GPK, gas-air mixture exploded without inflammation in the exhaust well. As a result of the explosion the process compressor operator was fatally injured.

Following the investigation of causes of the accident, the commission found that gas-air mixture explosion in the exhaust well was caused by the absence of interlock that interrupts

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fuel gas supply into combustion chamber. The condensate in the fuel gas supplied to the burners inhibited the ignition of startup (pilot) and primary burners, while the supply of gas flow into the condensate chamber was increased by the automatic control system.

Violations of the process conditions and regulations for maintenance of technical devices became the causes of two accidents (14 % of the total number of accidents), specifically:

**On January 30, 2013**, the explosion in the pump house of gas low temperature separation and fractionation of gas fractionation plant belonging to LLC LUKOIL-Permneftegazpererabotka resulted in the destruction of a two-storied building and loss of sealing of light hydrocarbon long distillate filling line.

The explosion of gas-air mixture discharged by a fan from the ventilation chamber into room RP-0,4 occurred when non-explosion-proof contact devices were actuated.

Following the investigation of the accident, the commission determined that the accident was caused by violation of the process procedure specified by the process regulations.

The process system seal failure leading the leak of oil product under pressure, its self-inflammation, followed by uncontrolled burning was the cause of the accident that occurred on September 19, 2013 in the atmospheric distillation plant belonging to LLC LUKOIL Ukhtaneftepererabotka.

The technical cause of the accident was incomplete closure of shut-off valves in the black oil supply line into the heat exchanger which was the result of penetration of foreign particles (sinter, cuttings, etc.) under the wedge during water draining from the heat exchanger after pre-startup leakage test, as well as loose threaded plug installed prior to the heat exchanger startup.

One of the accidents that occurred in the reporting period on August 31, 2013 in the tank car loading and receiving rack belonging to JSC Novokuibyshevskaya Petrochemical Company was caused by violation of shunting operations.

Personnel error in the course of shunting operations led to collision of the shunting locomotive with a rake of 18 tank cars positioned in the tank car loading and receiving rack where gaseous phase was extracted, their displacement resulting in disengagement of loading/unloading hoses and release of explosive and flammable product of light hydrocarbon long distillate into the atmosphere.

During displacement of the tank cars, steel components of the rack folding catwalks and the ladders of tank cars contacted each other, which caused sparking and inflammation of hydrocarbon vapors.

As a result of the accident, gaseous phase unloading and extraction stand pipes in the tank car loading and receiving rack tracks were partially damaged, guard rails of the top platforms and folding catwalks were broken, rubber-fabric hoses, four cut-off valves in the gantry, electrical equipment (cables, lights, etc.), I&C devices were partially destroyed by fire. Tank cars under the rack were exposed to heat impact, guard railing of service platforms and ladders, shutoff safety valves were damaged.

The damage caused by the accident amounted to 11,566 thousand rubles.

It should be noted, that organizational causes of accidents and casualties ensued from inefficient arrangement and exercising of production control of observance of industrial safety requirements in the HIFs of the organizations under supervision, violations of the procedure for conducting hazardous types of works and improper arrangement of works, as well as lack of supervision over repair and erection works by the persons responsible.

The information on accomplishment of actions proposed by the commission for technical investigation of accident causes, once the terms set for fulfillment of each item of the action expire, is submitted by the head of Rostekhnadzor regional body responsible for the territory



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where the accident took place to Rostekhnadzor headquarters.

The state of emergency resistance of the supervised enterprises is on the whole assessed as satisfactory.

Implementation of the investment programs for modernization of operational production facilities and commissioning of new petroleum re-refining facilities in petroleum refineries made it possible to decommission unpromising production facilities and reduce the share of worn-out main equipment. Thus, JSC Gazpromneftekhim Salavat completed the construction and commissioned ELOU-AVT-6 primary crude oil processing plant, which made it possible to decommission worn-out and obsolete AVT-4 and ELOU-5 plants.

Implementation of modernization plans that include reconstruction of operational and construction of new petroleum re-refining facilities, which involves replacement of the equipment, made it possible to reduce the average wear of the equipment in petroleum refineries from 41.1 % in 2012 to 38.6 % in 2013. Thus, in JSC Khabarovsk NPZ the share of equipment, which had been in operation for over 20 year, was reduced to 16 % in 2013.

On the whole in 2013 seven petroleum re-refining plants were constructed and commissioned in JSC Slavneft-YANOS, JSC Orsknefteorgsintez, LLC LUKOIL-Ukhtaneftepererabotka, JSC Saratov NPZ, LLC PO Kirishinefteorgsintez, LLC LUKOIL Permnefteorgsintez, Astrakhan GRP (JSC Gazprom), which significantly increased the level of industrial safety of supervised production facilities.

In 2013, Rostekhnadzor regional bodies conducted 4,626 (in 2012 – 4,693) checks of observance of industrial safety requirements during operation of oil and gas refining, petrochemical production facilities and petroleum product supply facilities, in the course of which 23,157 (in 2012 - 30,190) violations of industrial safety requirements were revealed. The total number of administrative penalties imposed as a result of the checks amounted to 2,061 (in 2012 – 2,297). The total sum of the administrative fines amounted to 107,899.2 thousand rubles (in 2012 - 123,119.4 thousand rubles), including 75,334 thousand rubles of fines imposed on legal entities, and 31,886.2 thousand rubles - on the officials.

Thus, in the course of the check of oil and gas refining industry HIFs operated by the Tatneftegazpererabotka Department and Yelkhovneft Oil and Gas Production Department of JSC Tatneft named after V.D. Shashin, 508 violations of the regulatory and legal acts, and regulatory technical documents during operation of HIFs were revealed.

Monitoring of compliance with industrial safety requirements indicates that typical violations during operation of HIFs are:

lack of monitoring equipment and emergency protection means in the facilities;

failure to provide leak tightness of the process systems;

unavailability of fast acting isolating devices in the pipelines;

violations of the arrangement and exercising of production control;

failure to meet the deadlines for conducting industrial safety review of technical devices;

violations of the regulations for maintaining operational documentation.

23 officials were called for administrative responsibility for committed violations of the current legislation, the total sum of imposed fines amounted to 462 thousand rubles.

During the checks of supervised enterprises, Rostekhnadzor regional bodies analyze the compliance with legally established regulatory procedures in the field of industrial safety that affect stability and safety of HIF operation.

Industrial safety review is conducted in accordance with the requirements of Federal Law No.116-FZ of July 21, 1997, “On Industrial Safety of Hazardous Industrial Facilities.”

In 2013, Rostekhnadzor regional bodies reviewed and registered 51,176 industrial safety review reports (which is 12 % less than in 2012), including the reviews of: design

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documentation — 3,540 (5.4 % of the total number of review reports); technical devices — 45,986 (84.9 %); buildings and engineering structures — 3,771 (4.7 %); declarations of safety — 20 (0.1 %); operational documentation — 859 (4.9 %).

4,034 conclusions of industrial safety review reports were not approved (7.8 % of the total number of registered reports).

The grounds for refusal to approve the industrial safety review reports are related to violation of the review procedure, including non-compliance with the requirements to the format of industrial safety review report, non-compliance of the scope of expert examination established by the regulatory documents and the program for expert activities, lack of substantiation for conducting the review of design documentation on modernization of hazardous industrial facilities, assessment of the substantiation of adopted design solutions, substantiation for declaring hazardous industrial facilities.

An important direction of control of industrial safety of hazardous industrial facilities is the effectiveness of production control service.

Virtually in all supervised organizations relevant structures were established and persons responsible for arrangement and exercising of production control were appointed.

In 501 out of 4,623 organizations, operating hazardous industrial facilities, production control services were established; in the remaining organizations persons responsible for exercising production control were appointed.

Rostekhnadzor bodies and production control services of the organizations developed 20,787 measures aimed at assurance of industrial safety of hazardous industrial facilities.

16,051 verification checks were planned for 2013. Actually, 15,961 checks were conducted, which makes up 99.4 % of the target figure.

Still, there are significant deficiencies in the arrangement of production control that decrease its effectiveness:

- the state of industrial safety is not analyzed;

- inspection plans are not developed;

- supervision over timely accomplishment of diagnostics and required tests of technical devices used in hazardous industrial facilities is not exercised;

- supervision over meeting the deadlines for fulfillment of orders and over submission of notifications of fulfillment thereof is not exercised.

The effectiveness of production control system is assessed by the state of industrial safety level of the organization.

Industrial safety management systems of hazard class I and II HIFs are established in major production organizations and vertically integrated companies.

The state of industrial safety of hazardous industrial facilities is affected by the arrangement and conduct of the checks of fulfillment of license requirements and conditions.

In 2013, the regional bodies reviewed 198 (in 2012 - 776 ) applications (materials) for the right to conduct the activities in the field of industrial safety of petrochemical and oil-refining industry production facilities and 160 applications (materials) for license renewal. 143 licenses were granted following the review. The issue of licenses to 55 organizations was rejected. Thus, due to the absence of a positive conclusion of industrial safety review for technical devices used in hazardous industrial facility, and of the agreement for rendering services by professional emergency rescue units, the issue of licenses was rejected to LLC Bituminous Concrete Plant, JSC Zheldorremash (the Volgograd Region).

In 2013, 498 checks of compliance with license requirements and conditions were conducted. 1,060 violations of the license requirements and conditions were revealed and orders for elimination thereof issued. Typical violations of the license requirements and conditions

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revealed by the regional bodies include:

low level of arrangement of production control;

failure to observe the times set for diagnostics of technical devices, buildings, and engineering structures;

non-observance of the procedure for training and qualification of specialists in the field of industrial safety.

At the same time, no gross violations of the license requirements and conditions leading to administrative suspension of the activity were revealed.

For violations of license conditions and requirements administrative action was taken against 93 employees and organizations, and the sum of the fines imposed amounted to 4,666 thousand rubles.

All Operators of hazardous industrial facilities took out insurance against liability for damnification in the course of operation of hazardous industrial facility; insurance agreements are concluded opportunely and prolonged in accordance with the established procedure.

Compiling of registers of insurance agreements within the frameworks of IIS, accounting for and detection of overdue policies, generation of database of enterprises are accomplished by Rostekhnadzor regional bodies.

During the checks of the supervised enterprises, their readiness for elimination and localization of the consequences of accidents was also assessed, that is one of the primary tasks, the solution of which affects the scale and severity of the consequences of industrial accidents.

Supervised enterprises operating petrochemical, oil and gas refining hazardous industrial facilities, petroleum product supply facilities create their own emergency rescue units or conclude contracts for services with professional emergency rescue units.

In order to maintain the required level of preparedness for emergency localization and elimination of their consequences, the studies and drills, including those with the participation of the units of EMERCOM of Russia, are regularly conducted.

Major enterprises, like LLC PO KINEF, NOVATEK-Ust-Luga, JSC Rosneftbunker have their own emergency rescue units certified in accordance with the established procedure. The drills conducted in LLC PO KINEF, JSC Rosneftbunker demonstrated prompt arrival of the personnel, coordinated actions of the services, speedy elimination of the emergency.

During the checks of the enterprises operating HIFs, it was established that material resources and financial assets for localization and elimination of emergencies are available.

At the same time, there are problems associated with unavailability of emergency rescue services and units in the towns and areas of the Krasnoyarsk Territory: the indicated services are stationed only in the city of Krasnoyarsk.

In the Khabarovsk Territory, a number of organizations and enterprises stationed in Okhotsk, Nikolayevsk, Ayano-Maisk, Tuguro-Chumikan areas are located at a distance of up to 1,000 km from the administrative center of the Territory. In these areas the effectiveness of professional emergency rescue units assumes formal character.

Taking into account the climatic and territorial features of the Tyumen Region, vast areas and unavailability of constant communication between settlements, the activity of professional emergency rescue units is frequently of a formal nature, particularly, this trend manifests itself in is the Khanty-Mansi Autonomous Area - Yugra and in the Yamalo-Nenets Autonomous Area, where professional emergency rescue units responsible for elimination of oil and oil product outflows are stationed in the towns of Nyagan (Talinskoye deposit), Khanty-Mansiysk, Nizhnevartovsk, Surgut, while hazardous industrial facilities are located at a distance of 300 km and more from the bases of emergency rescue units.

### 2.2.11. Trunk Pipeline Transport and Gas Underground Storage Facilities

According to the reports of Rostekhnadzor territorial bodies, the total number of organizations (legal entities) operating in the field of industrial safety of the trunk pipeline transport and gas underground storage facilities amounts to 278. The number of supervised trunk pipeline transport facilities in 2013 amounted to 5,243, including trunk gas pipelines - 408, compressor stations - 236, NGV refueling compressor stations - 211, gas distribution stations - 3,586, main product pipelines, oil pipelines, ammonia pipelines - 213, main product pipeline and oil pipeline tank farms - 190, main product pipeline and oil pipeline pumping stations - 340, drain and bulk liquid terminals (platforms) - 31, underground gas storage facilities - 28.

The total length of the linear part of trunk pipelines exceeds 255,029 km, of which:

trunk gas pipelines – 174,121 km;

oil-trunk pipelines – 55,326 km

main product pipelines – 25,582 km, including: ammonia pipelines – 1,396 km;

natural gas liquids pipelines - 4,297 km

During the 12 months of 2013, 12 accidents occurred on supervised trunk pipeline transport hazardous industrial facilities (HIFs). No fatalities were registered (see Table 62 and 63).

In comparison with 2012, the number of accidents on trunk pipeline transport facilities decreased by 9 (see Table 62).

Dynamics of accident and injury rates for the years 2009-2013 is shown in Table 63 and Fig. 12.

Aggregate loss from accidents in 2013 was 318,915 thousand rubles, including direct losses from accidents which amounted to 74,064 thousand rubles, costs on localization and liquidation of accident consequences - 211,555 thousand rubles, environmental damage - 4,971 thousand rubles, damage caused to the third parties - 332 thousand rubles.

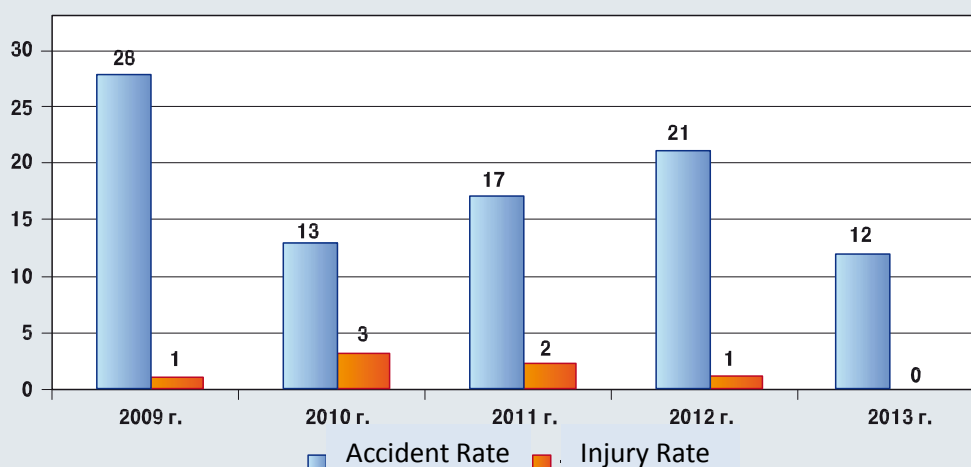
**Table 62**

#### ***Accidents by trunk pipeline transport hazardous industrial facilities (HIF)***

	<b>2012</b>	<b>2013</b>
Gas pipelines	16	9
Oil pipelines	5	2
Oil product pipelines	—	1
Ammonia pipelines	—	—
<b>Total:</b>	<b>21</b>	<b>12</b>

**Table 63*****Dynamics of accident and injury rates for supervised trunk pipeline transport HIFs in 2009-2013***

<b>Year</b>	<b>Accidents</b>	<b>Fatalities</b>
2009	28	1
2010	13	3
2011	17	2
2012	21	1
2013	12	—

**Fig. 12.** Dynamics of accidents and occupational injuries at supervised trunk pipeline transport HIFs in 2019-2013

Distribution of accidents by their occurrence causes is shown in Table 64.

**Table 64*****Accidents by their occurrence causes***

<b>Accidents at Trunk Pipeline Transport Facilities</b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Gas pipelines	16	9	-7
Design deficiencies	3	1	-2
Construction/ manufacturing spoilage	6	3	-3
Corrosion of metal pipes (stress corrosion cracking)	6	2	-4
Human error in the operation	—	—	0
Equipment wearing	—	—	0
The impact of acts of God of natural origin	—	—	0
Mechanical impact	1	3	+ 2
Oil pipelines	5	2	-3
Design deficiencies	1	—	-1
Construction/ manufacturing spoilage	2	2	0
Equipment wearing	1	0	-1
Mechanical impact	—	—	0



<b><i>Accidents at Trunk Pipeline Transport Facilities</i></b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Illegal tapping	—	—	0
Violation of hazardous work performance procedure	1	—	-1
Oil product pipelines	—	1	+1
Design deficiencies	—	—	0
Construction/ manufacturing spoilage	—	—	0
Illegal tapping	—	—	0
Mechanical impact	—	1	+ 1
<b>Total:</b>	<b>21</b>	<b>12</b>	<b>-9</b>

According to the reports of Rostekhnadzor territorial bodies, in 2013, 200 incidents occurred on trunk pipeline transport HIFs, which is 22% less than in 2012 (257 incidents). Of the 200 incidents, 190 incidents (95%) was due to failures or damage of technical devices and 10 incidents (5%) were caused by deviations from processes conditions.

According to the analysis, accidents due to faults during construction works and pipe manufacturing in the shop constitute 41.6% of the total number of accidents in 2013 (5 accidents: on gas pipelines - 3 accidents, on oil pipelines - 2 accidents).

**March 3, 2013**, six pipe sections got damaged with gas ignition at 1,704 km of the 1st thread of gas trunk pipeline "Bukhara-Ural" operated by LLC "Gazprom Transgaz Ekaterinburg" supervised by the Ural Department of Rostekhnadzor due to spoilage in manufacturing. The material damage amounted to 25,928 thousand rubles.

**January 26, 2013**, destruction of pipe section occurred with the oil spill without a fire on 879 km of oil trunk pipeline "Kuibyshev-Lisicansk" operated by JSC "Privolzhsknefteprovod", supervised by Middle Volga River Basin (Middle-Povolzhiye) Department of Rostekhnadzor, due to spoilage in manufacturing. The material damage amounted to 128,546 thousand rubles.

September 1, 2013, on 740.15 km of oil trunk pipeline "Kuibyshev-Lisicansk", operated by "Privolzhsknefteprovod", Volgograd Region, destruction of oil pipeline occurred with commercial oil leak of 38 m<sup>3</sup> due to spoilage in manufacturing. The material damage amounted to 95,598 thousand rubles.

Accidents due to violation of work execution rules in the protected zone of a trunk pipeline constitute 33% (4 accidents: on gas pipelines - 3, on product pipelines - 1) of the total number of all the accidents occurred in 2013.

**July 1, 2013**, destruction of pipe section with gas ignition occurred at the 164-th km of trunk gas pipeline "Taas - Yuriakh - Mirny" operated by JSC "ALROSA-Gaz" supervised by Lena Department of Rostekhnadzor, because of damage to pipeline by excavator bucket due to violations of the rules of work execution in the trunk pipeline protected zone. The material damage amounted to 11,730 thousand rubles.

The proportion of accidents that have occurred as a result of stress corrosion cracking of pipes in 2013 reduced from 6 in 2012 down to 2 in 2013.

The number of accidents that have occurred due to violations of technology and improper organization of work process, and violation of labor discipline amounted to 76% of the total.

Distribution of accidents in 2012 and 2013 between the subjects of the Russian Federation and Rostekhnadzor territorial bodies is shown in Table 65.

**Table 65**  
**Accidents in 2012 and 2013 by the subjects of the Russian Federation**

<b>Federal Districts of the Russian Federation (territorial bodies of Rostekhnadzor)</b>	<b>Accidents</b>		
	<b>2012</b>	<b>2013</b>	<b>+/-</b>
<b>Central Federal District (Moscow)</b>	<b>2</b>	<b>0</b>	<b>-2</b>
Moscow Region	1	0	-1
Tver Region	1	0	-1
<b>North-Western Federal District (St. Petersburg)</b>	<b>1</b>	<b>3</b>	<b>+2</b>
Leningradskaya Region	1	1	0
Pskov Region	0	1	+1
Novgorod Region	0	1	+1
<b>Southern Federal District (Rostov-on-Don)</b>	<b>3</b>	<b>3</b>	<b>0</b>
Krasnodar Territory	2	1	-1
Volgograd Region	1	2	+1
<b>Ural Federal District (Ekaterinburg)</b>	<b>1</b>	<b>3</b>	<b>-7</b>
Tyumen Region	2	2	0
Khanty-Mansi Autonomous Area	6		+4
Chelyabinsk Region	2	1	+2
<b>Volga Federal District (Nizhniy Novgorod)</b>	<b>4</b>	<b>2</b>	<b>-2</b>
Nizhniy Novgorod Region	0	1	+1
Perm Territory	1	1	0
Saratov Region	2	0	-2
Orenburg Region	1	0	-1
<b>Far East Federal District (Khabarovsk)</b>	<b>0</b>	<b>1</b>	<b>+1</b>
Republic of Sakha (Yakutia)	0	1	+1
<b>Total in Russia:</b>	<b>21</b>	<b>12</b>	<b>-9</b>

Accidents occurred on HIFs supervised by the North-Western (3), Ural (1) Middle Volga River Basin (Middle-Povolzhiye) (2), North-Ural (2), North Caucasus (1) West-Ural (1), Volga - Oka (1), Lena (1) Departments of Rostekhnadzor.

In order to prevent accidents on trunk pipeline transport facilities, Rostekhnadzor within its powers maintains industrial safety monitoring at trunk pipeline transport enterprises.

In 2013, the territorial bodies conducted 1,899 inspections of 261 legal entities and individual entrepreneurs, including: scheduled inspections — 304; non-scheduled inspections — 1,595, including 241 inspections in the execution of previously issued orders.

In the framework of on-going state inspection (supervision) regime, 1,562 inspections were carried out on trunk pipeline transport facilities.

Territorial bodies revealed and ordered to eliminate 7,322 violations of Industrial Safety, of which 4,449 violations were revealed during scheduled inspections and 2,873 violations were revealed during unscheduled inspections. The number of imposed administrative penalties is 1,020 including 8 suspensions of activity and 1,012 administrative penalties imposed. Amount of imposed penalties is 25,642 thousand rubles, of which 39 thousand rubles refer to penalties on citizens, 5,779 thousand rubles refer to penalties on officials and 19,824 thousand rubles refer to penalties on legal entities. The amount of collected penalties is 17,381 thousand rubles.

Inspections of supervised legal entities for compliance with the requirements for industrial safety assurance and monitoring of pipeline transport enterprises revealed:

- failure to conduct timely surveys of trunk pipeline transport facilities with the use of modern diagnostic tools, which significantly reduces the level of HIF safe operation;

- violations of technology and the wrong organization of works, violation of labor discipline.

Problems existing for gas distribution stations (hereinafter "GDS") not included in the Integrated gas transport system of JSC "Gazprom" and being on the balance of gas consumers remain unsolved. For example, organizations operating 12 GDS (supervised by the North Caucasus Department of Rostekhnadzor) not included in Gazprom Integrated gas transport system and kept on the balance of gas consumers (municipal district councils and village administrations) have neither technical nor economical capabilities to maintain facilities in good and safe condition. Gas distribution station equipment, in most cases, have exhausted its standard lifetime. GDS owners do not comply with the requirements for safe operation of the facilities, operation activities are carried out without a license for operation of explosion and fire hazardous industrial facilities. GDS is not registered in the public HIF register, there is no insurance risk of civil liability for its damage as a result of accident at HIF. A similar situation is also valid for the facilities supervised by Caucasian Department of Rostekhnadzor. One of the solutions for this problem may be to include these facilities into the Integrated gas transport system through transferring the facilities on the balance of Gazprom gas transport entities.

So far, the design documentation and departmental regulatory documents define no time limit for operation of the trunk pipeline transport facilities, which prevents timely and adequate diagnostics of the trunk pipelines and equipment of the enterprises to determine their technical condition and residual life time.

To solve these issues, in 2013, Rostekhnadzor analyzed the current legal framework and on the basis of industrial safety analysis has developed Federal codes and regulations on safety of hazardous industrial facilities of trunk pipelines, approved by order of Rostekhnadzor on November 6, 2013 No. 520 registered by the Russian Ministry of Justice on December 16, 2013, under registration number 30605, and Rules on safety of underground gas storage facilities, approved by order of Rostekhnadzor on November 22, 2013 No. 561, registered by Russian Ministry of Justice on December 31, 2013, under registration number 30994.

Production control departments, Regulations on which are agreed by Rostekhnadzor territorial bodies, are established and functioning at 135 supervised trunk pipeline transport enterprises.

At the same time in 2013, one organization (LLC "Balttransnefteprodukt") did not submit a report on the implementation of activities, control and preventive inspections of production control in connection with a merger of subsidiaries of JSC "AK" Transneft".

Supervised enterprises carried out 35,012 actions to ensure industrial safety and 15,006 control and preventive inspections in the frame of production control.

The enterprises have industrial safety declarations approved by Rostekhnadzor Headquarters.

In 2013, 318 industrial safety declarations and reviews of industrial safety declarations were analyzed.

For 12 months in 2013, 660 reviews of documentation on industrial safety, 2,220 reviews on industrial safety of buildings and structures, 8,053 reviews of industrial safety of technical devices and 33 industrial safety reviews of other documents were analyzed. Out of 11,289 industrial safety reviews analyzed, 8,911 reviews (79%) were approved and 2,378 reviews (21%) were rejected.

Insurance of liability for damage resulting from HIF operation is implemented at all enterprises in accordance with the provisions of the Federal Law No. 225-FZ of July 27, 2010 "On compulsory insurance of civil liability of the owner of a hazardous facility for causing harm in an accident at the hazardous facility."

All organizations engaged in the transportation of oil and gas via trunk pipelines have contracts with professional rescue services.

The staff at enterprises regularly have training sessions. JSC "Gazprom" and JSC "AK" "Transneft" trunk pipeline transport enterprises have established their own non-professional emergency rescue teams. Other enterprises enter into contracts for services with certified emergency rescue teams. Based on the inspection results it is found that the emergency rescue teams of enterprises operating trunk pipelines are ready for rescue and recovery operations.

The enterprises have developed plans on elimination of possible accidents at all trunk pipeline HIFs, as well as plans on elimination of emergency oil outflow on trunk pipelines and oil product pipelines. The plans are agreed upon by all the authorities concerned and territorial administrations. The enterprises have reserve funds, emergency supply of materials, special equipment, communications equipment, and trained personnel to eliminate possible accidents and emergency spills. Drills are conducted to practice the actions of personnel of operating organizations in localizing and eliminating the consequences of accidents.

JSC "Gazprom" development strategy provides for the expansion of transport capacity and diversification of gas transportation routes.

The current priority projects in the development of gas transport system are construction of "Nord Stream" gas pipeline, the trunk gas pipelines for transporting gas from the Yamal Peninsula ("Bovanenkovo - Ukhta" and "Ukhta - Torzhok"), as well as construction of "South Stream" gas pipeline, which along with "Nord Stream" project will ensure diversification of routes of gas supplies to the European market. In addition, "Gazprom" is involved in the development of gas transport system in Central Asia.

The largest of the projects implemented by JSC "AK" Transneft " are: Pipeline system "Eastern Siberia-Pacific Ocean», Step I, section "Taishet-Skovorodino" (ESPO-1), length 2,694 km, diameter 1,220, production capacity 30 million tons per year, with an increase to 58 million tons per year;

Pipeline system "Eastern Siberia-Pacific Ocean», Stage II, section "Skovorodino-SMNP" Kozmino ", length 2,046 km, diameter 1,220, production capacity 30 million tons per year, with an increase to 36 million tons per year; "Baltic Pipeline System - 2, the first stage" (BPS-2), length 1000 km, capacity 30 million tons per year;

pipeline "NPS" Purpe"- NPS" Samotlor", length 429 km, capacity 25 m tons per year;

pipeline "Zapolyarye-Purpe", length 485 km, diameter 1020/820, capacity up to 45 million tons per year;

construction of the trunk oil pipeline "Kuyumba-Taishet", length 705 km, diameter 530/720, capacity 15 m tons per year.

The state construction supervision over the above-mentioned facilities is organized and maintained by Rostekhnadzor territorial bodies.

At present JSC "Gazprom" in the implementation of adopted in April 2011 Comprehensive program of reconstruction and modernization of gas transport facilities and underground storage facilities for 2011-2015 is constructing Kaliningrad, Bednodemyanovsk and Novomoskovsk underground gas storage facilities. Rostekhnadzor maintains the federal state supervision over construction of the facilities.

In order to bring the technical condition of the trunk pipeline transport facilities in full compliance with the requirements of regulatory documents, JSC "AK" Transneft" implements:

A comprehensive program of diagnostics, modernization, reconstruction and overhaul for the period up to 2017,

Innovative Development Program for the period up to 2017,

Program of energy saving and enhancement of energy efficiency for the period up to 2015,

In addition, it is planned to implement the investment programs and financial plans of JSC "AK" Transneft "and JSC "Gazprom" in 2014 and in the planned period of 2015 and 2016.

#### *2.2.12. Metallurgical and Chemical Recovery Industries and Facilities*

According to the results of 2013, production of pig iron in the Russian Federation amounted to 50.0 million tons (99.3% of the volume in 2012), steel - 68.8 million tons (97.7% of the volume in 2012), rolled ferrous metal products 58.0 million tons



(98.5% of the volume in 2012), steel pipes 10.0 million tons (103.1% of the volume in 2012).

In non-ferrous metallurgy the primary aluminum production output in 2013 amounted to 89.5 % of output in 2012, refined copper – 97.9 %, nickel – 97.6 %.

1,691 supervised metallurgical and chemical recovery organizations and 1,234 HIFs are registered in the State Register of hazardous production facilities. Among them, the largest vertically integrated companies are the following:

JSC "MMK" (Magnitogorsk Iron and Steel Works);

JSC "Severstal",

JSC "EVRAZ" (EvrazHolding) (JSC "EVRAZ Nizhny Tagil Metallurgical Plant" and JSC "Evraz United West Siberian Metallurgical Plant"),

JSC "RUSAL" (United Company Rusal),

LLC MC "Metalloinvest"

JSC "Novolipetsk Steel Mill", JSC MMC Norilsk Nickel,

JSC "Russian Copper Company",

JSC "VSMPO-AVISMA" (Corporation VSMPO-AVISMA),

JSC "TMK" (Tube Metallurgical Company), etc.

The above entities are engaged in production of cast iron, steel, coke, ferro-alloys, rolled products, tubes, non-ferrous and precious metals, hard alloys, powders, etc.

In 2013, 9 fatalities (in 2012 - 15) occurred at the supervised metallurgical and chemical recovery enterprises and industries, including: 4 group cases (in 2012 - 1), in which 11 persons suffered, with 4 lethal outcomes. There were 2 accidents (in 2012 - 3), (Table 66), material damage caused by the accidents amounted to 52,861 thousand rubles.

**Table 66**

***Total Number of Accidents at Metallurgical Facilities and their Distribution by Types of Accidents***

<b><i>Types of Accidents</i></b>	<b><i>Number of</i></b>		
	<b><i>2012</i></b>	<b><i>2013</i></b>	<b><i>+/-</i></b>
Destruction of buildings and engineering structures	3	1	-2
Destruction of technical devices	0	1	+1
<b><i>Total:</i></b>	<b><i>3</i></b>	<b><i>2</i></b>	<b><i>-1</i></b>

In 2013, there were two accidents involving the destruction of industrial building and technical devices (Table 66).

**September 3, 2013** at the Polar Division of JSC "Mining and Metallurgical Company "Norilsk Nickel "( Norilsk, Krasnoyarsk Territory) a melt release from ore-thermal furnace occurred during melting. There are no injured in the result of the accident.

Technical (technological) causes of the accident:

reduction of metallization of metal iron content in the matte smelting due to untimely measures for adjustment of flux mixture,

violent changes in raw material mixture,

inertia in adjusting the quality and chemical composition of charge due to a long process of preparing and filing the charge in the furnace, and quite long processes of preparation for transportation and issue of mill test analysis.

Organizational cause of the accident was untimely decision to adjust the flux mixture in the environment of a sharp change of qualitative indices of raw material.

**November 19, 2013**, ignition occurred in the furnace transformer premises in the melting area of Foundry Shop 01, "VKM-Steel" (Republic of Mordovia, Saransk) due to short circuit in the middle winding of the reactor of transformer ETMPK 3800 / 10kVA (year of manufacture - 1969). The shop roof collapsed in place above the transformer premises, and the ceiling floor of the furnace transformer premises collapsed as well. The cause for collapse was high temperature effects on the ceiling metal structures due to the furnace transformer fire.

Causes of the accident:

violation of the process, namely a long-term (over 40 years) operation of the furnace transformer in close to a short circuit modes, without overhaul with opening and replacement of windings, and without the necessary analysis of instrumentation results,

unsatisfactory organization of work procedure, namely insufficient monitoring of technical condition of the transformer.

Analysis of accident and fatal accident rate statistics between 2006 and 2013 demonstrates that in 2013, metallurgical and chemical recovery enterprises and industries decreased the level of fatal accidents, accidents and the number of victims in group accidents (Fig. 13).

The main injury factors in 2013 were: effects from rotating and moving equipment parts (33.4% of the total number of factors); melt and slag releases and gas explosions from metallurgical units (33.4%); collapse of structures, equipment, materials (1%); emissions of process gases, and industrial toxic substances (22.2%) (Table 67),

The primarily causes of accidents for the reported period were: Unsatisfactory organization of work process (32.5% of all causes); violation of technology of metallurgical process operations (19%); violation of production and labor discipline, and internal work regulations (14%); low level of production control of industrial safety (14%); design flaws of technical devices (12%); poor technical condition of fences (8.5%).

In 2013, the primary causes of group accidents were technology violations during the processes, the use of equipment not in line with the new design solutions, materials and production practices, and unsatisfactory quality of equipment after repair.

Thus, on **February 8, 2013**, a group accident occurred at JSC "Novolipetsk Steel Mill."

At the factory "Koksochimproizvodstvo", in by-product recovery shop, on loading - unloading platform of benzene products warehouse, the crude benzene leak occurred during crude benzene unloading from rail tank cars resulted into four persons being injured with two deaths, one person having severe damage to health as a result of poisoning and one person having light degree damage to health as a result of poisoning.

The technical cause which led to the group accident was the fault of the multipurpose drainage in the tank car due to defects.

Organizational causes:

Unsatisfactory organization and execution of works relating to crude benzene draining from the tank-car in the tank benzene products storage facility,

Unsatisfactory production monitoring of compliance with industrial safety requirements at the hazardous industrial facilities by "Koksochimproizvodstvo" managers and specialists during organization and execution of benzene unloading from the tanks,

Unsatisfactory quality of the tank-car repair at the repair factory subordinate to JSC "Russian Railways", which led to the group accident. May 13, 2013, 8.3 tons metal scrap (charge) was charged to the furnace during scheduled metal heat in Furnace No.2 at locomotive and wagon repair plant in Ulan-Ude - branch of JSC "Zheldorremmash". During the melting process in the furnace, the destruction of the thickened crust monolith occurred with the release of accumulated gases in the form of a flame from a the "metal-slag" border zone which contributed to the first gas shot. Due to a pressure relief and vibration in the furnace caused by the first shot, an intensive process of expansion of gases dissolved in a volume of molten steel occurred that resulted into the second shot. Next a release of melting products (slag and molten steel) occurred resulting into injuring three people, including one person killed, 2 persons as a result of burns received severe damage to health. Group accident with victims occurred during the uncontrolled release of molten metal and slag.

Causes of group accident:

Charge materials were consumed with violation of applicable norms (established through the charge calculation), Process Manual "Making steel grade 20 GL in electric arc furnace DS5MT, DS6N1", namely while the rated scrap charge to the furnace shall be 6.0 tons with permissible excess of 20% and not more than 7.2 tons, the metal scrap was charged into the furnace in the amount of 8.3 tons due to lack of control during charging procedure,

During the melting process such things were missing as monitoring of slag condition and slag adjustment with limestone additive or lime - unburnt material additive, with fluorspar slag or chamotte rubble provided that by the end of melting operation, a free-running oxidizing slag is build-up in sufficient quantity in the furnace. During the melting operations, slag monitoring was not maintained due to a hung scrap metal on the threshold of the working opening, respectively, no adjustment of its free-running characteristics was performed, melting has not been canceled, which was the cause of thickening and hardening of slag and contributed to the localization of gases CO and CO<sub>2</sub> at the border "metal-slag", and gas dissolving in rimming metal;

Melting was carried out with violation of the process manual "Making of steel grade 20GL in electric arc furnace DS5MT, DS6N1",

Higher officials were not informed of the occurrence of emergency situation with the oven overload and hung scrap (charge) on the threshold of the working window from the view of taking measures to eliminate violations and stop operation of the furnace;

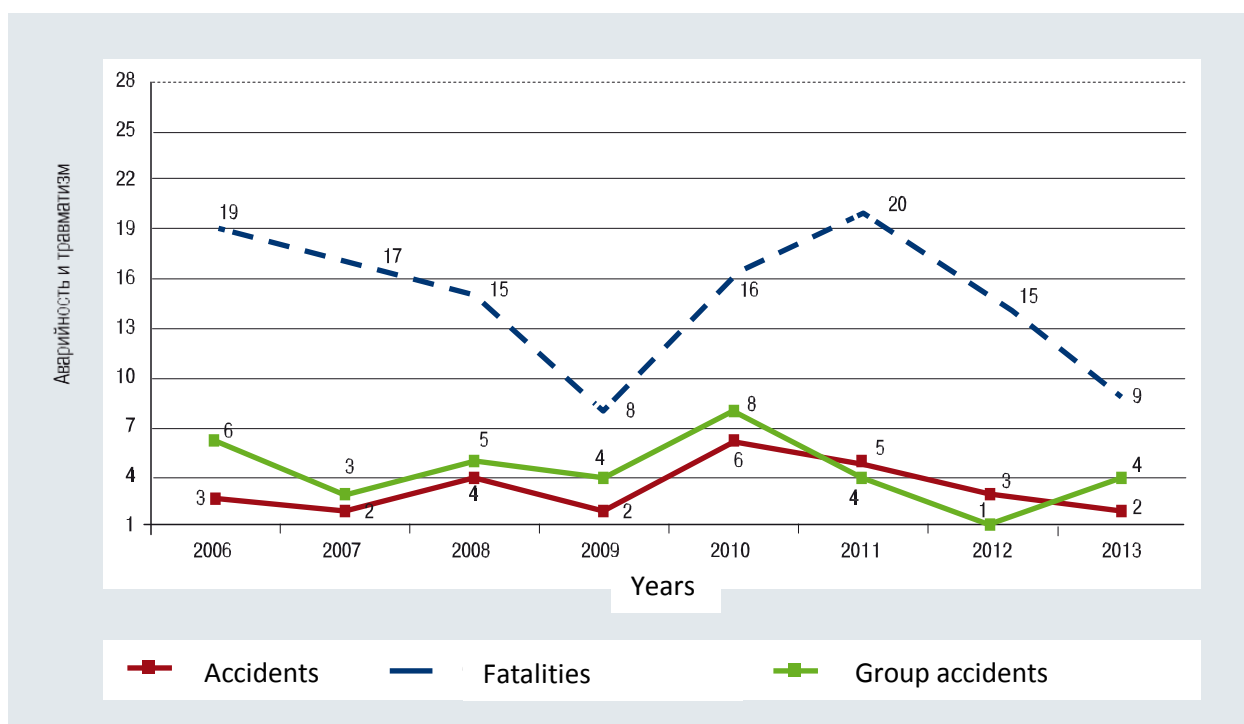
Due to extended period of scrap melting, a large amount of molten metal was generated, which began to boil, but on the slopes of the furnace, including the threshold of the working window, pieces of unmelted metal remained, the melting operation was not interrupted, and measures for timely collapsing the mixture were not taken.

Group accident with victims occurred because of violations of the federal codes and regulations in the field of industrial safety, namely paragraphs 2.1.1 and 2.3.17 of Safety Rules for foundries (PB 11-551-03); paragraphs 8.16 and 12.25 of Safety Rules in steelmaking (PB 11-552-03), as well as paragraph 7.2. of process instruction "Manufacture of steel grade 20GL in electric arc furnace DS5MT, DS6N1", and paragraph 9.2.7 of standard "OHSAS at Ulan-Ude locomotive and wagon repair plant" ST SBT 6.4.001-20.

**Table 67**

**Total Number of Fatalities at Metallurgical and Chemical Recovery Facilities by Injury Factors**

<i>Injury factors</i>	<i>Number of killed, persons</i>		
	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Moving and rotating mechanisms	6	3	-3
Melt and slag release and gas explosion	1	2	+1
Falling of the injured and objects from height	1	0	-1
Effects from gas and poisoning industrial toxic substances	3	3	—
Explosions of powder, dust, gases, etc.	1	—	-1
Collapsing of structures, equipment, materials	3	1	-2
<b>Total:</b>	<b>15</b>	<b>9</b>	<b>-6</b>



**Fig. 13.** Dynamics of accident and injury rates for metallurgical and chemical recovery enterprises for 2006–2013

**Table 68**

**Rostekhnadzor territorial bodies at which supervised organizations  
accidents and fatalities occurred**

<b>Territorial Body of Rostekhnadzor</b>	<b>Number of accidents</b>			<b>Number of fatalities</b>		
	<b>2012</b>	<b>2013</b>	<b>+/-</b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Rostekhnadzor Interregional Territorial Office	0	+1	1	—	—	—
Upper Don Department	—	—	—	1	2	+1
Oka Department	—	—	—	—	1	+1
North-Western Department	2	—	-2	1	1	—
Caucasus Department	—	—	—	1	—	-1
Western-Ural Department	1	—	-1	5	1	-4
Volga-Oka Department	—	1	+1	1	—	-1
Ural Department	—	—	—	3	2	-1
Siberian Department	—	—	—	3	1	-2
Trans-Baikal Department	—	—	—	—	1	+1
<b>Total for</b>	<b>3</b>	<b>2</b>	<b>-1</b>	<b>15</b>	<b>9</b>	<b>-6</b>

**Table 69**

**Subjects of the Russian Federation on which territory  
accidents and fatalities occurred**

<b>Subject of the Russian Federation</b>	<b>Number of accidents</b>			<b>Number of killed,</b>		
	<b>2012</b>	<b>2013</b>	<b>+/-</b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
<b>Central Federal District (Moscow)</b>	—	—	—	<b>1</b>	<b>3</b>	<b>+2</b>
Lipetsk Region	—	—	—	1	2	+1
Tula Region	—	—	—	—	1	+1
<b>North-Western Federal District (St. Petersburg)</b>	<b>2</b>	—	<b>-2</b>	<b>1</b>	<b>1</b>	—
Vologda Region	2	—	-2	1	1	—
<b>North Caucasian Federal District (Pyatigorsk)</b>	—	—	—	<b>1</b>	—	<b>-1</b>
Republic of North Ossetia - Alania	—	—	—	1	—	-1
<b>Volga Federal District (Nizhniy Novgorod)</b>	<b>1</b>	<b>+1</b>	—	<b>6</b>	<b>1</b>	<b>-5</b>
Republic of Mordovia	—	1	1	—	—	—
Nizhniy Novgorod Region	—	—	—	1	—	-1
Orenburg Region	1	—	-1	2	1	-1
Perm Region	—	—	—	3	—	-3
<b>Ural Federal District (Ekaterinburg)</b>	—	—	—	<b>3</b>	<b>2</b>	<b>-1</b>
Sverdlovsk Region	—	—	—	2	1	-1
Chelyabinsk Region	—	—	—	1	1	—
<b>Siberian Federal District (Novosibirsk)</b>	—	<b>1</b>	<b>+1</b>	<b>3</b>	<b>2</b>	<b>-1</b>
Republic of Buryatia	—	—	—	—	1	+1
Altai Territory	—	—	—	1	—	-1



<b>Subject of the Russian Federation</b>	<b>Number of accidents</b>			<b>Number of killed,</b>		
	<b>2012</b>	<b>2013</b>	<b>+/-</b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Krasnoyarsk Territory	—	1	+1	—	—	—
Kemerovo Region	—	—	—	1	1	—
Novosibirsk Region				1	0	-1
<b>Total:</b>	<b>3</b>	<b>2</b>	<b>-1</b>	<b>15</b>	<b>9</b>	<b>-6</b>

The largest number of fatalities occurred at metallurgical enterprises supervised by Upper Don Department of Rostekhnadzor (2) (Table 68).

Increase in injuries at supervised organizations is registered in Central Federal Department (+2) (Table 69).

In 2013, equipment retrofit and renovation activities, introduction of modern technologies at metallurgical and chemical recovery enterprises continued in the scheduled mode. Multipurpose rail and structural steel mill was commissioned at Chelyabinsk Metallurgical Plant (Mechel). This is Russia's first integrated multipurpose production of structural shapes and rails up to 100 m in length. The complex includes all the necessary process steps and uses the latest international developments in the field of rolling, tempering, straightening, finishing and quality control of rolled products. The output of Multipurpose rail and structural steel mill — to 1.1 m tons finished products per year. Investments volume — about 715 m USD.

LLC "Mednogorsk copper and sulfur plant" has completed reconstruction of sulfuric acid shop resulting in increased production of sulfuric acid, improved working conditions of sulfuric acid production workers, reduced amount of untreated gas emissions into the atmosphere. Re-equipment of germanium production shop is completed. A number of projects for melting unit waste gas disposal in the copper smelting shop are in process of implementation, e.g. re-equipment of copper storehouse including arrangement of dust bagging compartment and gas duct system with the bag filter, gas supply of gas-pulse plants (installation of standby compressors). "NLMK" JSC completed construction of modern Blast Furnace No. 7 with capacity of 3.4 m tons, construction of two single-position ladle furnace units is completed in Converter Shop No.1, as part of reconstruction process the replacement of three turbochargers at the Combined Heat Power Plant is in process, construction of ON/OFF circulation degasser completed in the Converter shop.

Steelmaking complex (electric arc furnace, continuous casting machine, reconstructed oxygen plant, degasser area) reached design capacity at JSC "Seversk Tube Works" (Polevskoy).

Two rotary furnaces KIO-75 with a capacity of 75 tons each, manufactured by ANDRITZ MAERZ GmbH (Germany), were commissioned at JSC "ROSSKAT".

Automatic foundry complex for aluminum alloys, model SHYB 13-15, was commissioned at LLC "Ankuver".

Insufficient financing of fixed assets replacement activities remains the main problem for industrial safety improvement. Many enterprises need reconstruction and re-equipment, works relating to improvement and renovation of the equipment are conducted slowly, Business Plans issued for re-equipment are constantly revised.

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In accordance with the RF Government Decree No. 263 of March 10, 1999 "On organization and implementation of production control of compliance with industrial safety requirements at hazardous industrial facilities", at supervised enterprises, production control is part of industrial safety management system and exercised by operating organization by means of a set of measures aimed at ensuring safe operation of the hazardous industrial facilities.

One of the main spheres of supervisory activity is inspection of production control efficiency, availability of work plans and persons responsible for production control. The management of supervised entities receives Rostekhnadzor statements of order prescribing to strengthen production control capabilities and hold liable employees of production control functional units who do not fulfill their duties. Chief Engineer of "NEC named after E.N. Kornienko", Director of JSC "TATPROF", Executive Director of "Chistopolsky Shipyard" were brought to administrative responsibility for improper implementation of production control. In January 2013, documents for the recovery of fines not paid in the 4-th quarter of 2012 by A.Yu. Novlyansky, Chief of production control department at "Zelenodolsk Plant named after A.M. Gorky", were sent to the Federal Bailiff Service of the Republic of Mari El, enforcement proceedings were initiated.

Measures to improve safety of production shops and facilities were developed by supervised enterprises. Schedules of review of major metallurgical, chemical recovery and foundry equipment, buildings and structures with the purpose to determine their further service life were issued, mostly they are executed in a timely manner. Control of the review objectivity and quality was performed in accordance with the requirements of regulatory and technical documents.

In 2013, Rostekhnadzor Headquarters approved 199 reviews of industrial safety of technical devices, 4 - reviews for buildings and structures, and 11 - for miscellaneous documentation. Eighteen review reports on metallurgical enterprises safety declarations were approved. For objective reasons approval of thirteen industrial safety reviews was denied.

The main reasons for refusal to approve industrial safety review reports: The absence of calculation of residual life; unjustified overstatement of timing for implementation of improvement measures.

Rostekhnadzor Headquarters received an application and supporting materials of LLC "Production Association KRAMZ-Technoservice" for permit to use the technical device. In reviewing the submitted materials, including the industrial safety review report issued by LLC CE "Technoservice and control", registered and approved by the head of Yenisei Department, non-conformances and violations of the requirements for industrial safety review were revealed. In the course of the functional inspection, improper performance of official duties relating to consideration of industrial safety review reports was found.

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Yenisei Department of Rostekhnadzor has withdrawn decision on compliance of the review report with the industrial safety requirements and on its approval.

According to the requirements of Article 15 of the Federal Law No. 116-FZ dated July 21, 1997 "On industrial safety of hazardous industrial facilities" and the RF Law No. 225-FZ dated July 27, 2010 "On compulsory civil liability insurance of owners of hazardous facilities for any harm inflicted as a result of an accident", which entered into force on January 1, 2012, the HIS operating companies shall underwrite liability for damage as a result of accident at hazardous facility. Inspectors keep records of the insurance contracts signed by supervised companies and control their validity. For the reporting period, the supervised metallurgical and chemical recovery enterprises, and production facilities operating HIFs have valid contracts on compulsory civil liability insurance of owners of hazardous facilities for any harm inflicted as a result of an accident at the hazardous facility.

In 2013, in accordance with the work plans, Rostekhnadzor territorial bodies carried out supervision over the availability of metallurgical and chemical recovery enterprises for elimination (localization) of possible accidents. Reserves of financing resources have been arranged for elimination (localization) of accidents and elimination of consequences of accidents.

The enterprises have developed plans on elimination (localization) of possible accidents. Basically they comply with Instructions on drawing up plans for elimination (localization) of accidents at metallurgical and chemical recovery production facilities (RD 11-561-03), and deficiencies revealed during inspections and alert drills are eliminated in a timely manner.

Deficiencies noted at certain HIFs were such as incomplete accounting of possible accident scenarios in the operational part of the Accident Liquidation Plan, the lack of coordinated scheduling of alert drills and parameters of actuation of emergency protection systems in the process flow diagram.

Considering the identified violations, the territorial bodies of Rostekhnadzor issued the relevant statements of order for their elimination.

In accordance with the Federal Law No. 151-FZ dated August 22, 1995 "On Rescue Services and Status of Rescuers", at metallurgical and chemical recovery enterprises preventive work to avoid and eliminate accidents is carried out by gas rescue services and voluntary gas rescue teams which are included in the structural units of enterprises. Currently, metallurgical and chemical recovery enterprises operating HIFs have their internal gas rescue services and voluntary gas rescue squads. Gas facilities at enterprises with minor headcount use services (on contractual basis) of professional emergency rescue services (units).

In 2013, territorial bodies of Rostekhnadzor have carried out at supervised metallurgical and chemical recovery enterprises and facilities 2,211 examinations (in 2012 - 2,611), identified and prescribed to eliminate 10,629 violations of industrial safety codes and regulations (in 2012 - 13,341), due to gross violations of operating rules, operation of 76 shop floors and facilities (in 2012 - 91) was suspended, 1,185 natural and legal persons were brought to administrative responsibility (in 2012 - 1,500), the amount of fines imposed totaled 54,744 thousand rubles (in 2012 - 75,620 thousand rubles).

In 2013, the number of performed surveys decreased by 18% in average, the number of prescribed for elimination violations of safety requirements decreased by 25%, the number of administrative suspensions of activity decreased by 19%, the number of employees brought to administrative responsibility decreased by 26%. The amount of fines collected decreased by 1.4 times.

The decrease of indicators in comparison with 2012 is due to the reduced number of supervised facilities after making changes to the Federal Law No. 116-FZ dated July 21, 1997 "On industrial safety of hazardous industrial facilities", and the associated decrease in the number of scheduled inspections.

In 2013, Rostekhnadzor Headquarters conducted two scheduled field comprehensive inspections of metallurgical enterprises: JSC "Severstal" and JSC "MMC Norilsk Nickel".

During the audit of JSC "Severstal", the audit team revealed 260 violations of industrial safety requirements, compiled 32 reports on administrative offenses (for 2 legal entities and 28 officers). They issued 2 orders on equipment operation activity suspension. The total value of imposed fines amounted to 790 thousand rubles (520 thousand rubles for officers and 270 thousand rubles for a legal person).

During the audit of JSC MMC Norilsk Nickel, the audit team revealed 270 violations of industrial safety requirements, compiled 24 reports on administrative offenses (for a legal person and 22 officers). They issued one order on equipment operation suspension. The total value of imposed fines amounted to 690 thousand rubles (440 thousand rubles for officers and 250 thousand rubles for a legal person).

Supervision of compliance with industrial safety requirements at 1,691 supervised metallurgical and chemical recovery enterprises and at 1,234 HIFs is provided by 84 inspectors. Length of service of the inspectors is from 3 months and up to 29 years. In 2013, expert organizations and experts were not involved in the implementation of control and supervisory functions.

In accordance with the Federal Law No. 116-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities" and the Federal Law No. 99-FZ dated May 4, 2011 "On licensing of specific types of activities", Rostekhnadzor issued licenses for operation of explosive and chemically hazardous industrial facilities, hazard class I, II and III, for organizations and expert organizations conducting industrial safety review. The Headquarters issued one license, reissued three licenses and refused to grant a license to one organization for operation of explosive and chemically hazardous industrial facilities, hazard class I, II and III.

One of the main spheres in industrial safety assurance activities in recent years remains monitoring over the implementation by enterprises of industrial safety management systems in HIF operation. Major metallurgical holding companies (management companies) with respect to their conditions have developed industrial safety management systems, which, as recommended in the result of audits, shall be aligned with the Federal Law No. 116-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities."

The effectiveness of industrial safety management systems is ensured through the following functions:

- preventive work to comply with the requirements of the regulations, codes and instructions valid at HIFs,

- supervision of works and the actual state of industrial safety,

- analysis, forecasting of industrial safety, development of preventive measures,

- planning and financing work to ensure industrial safety requirements.

At a number of enterprises the major drawbacks are formalism and the lack of insistence displayed by managers of enterprises and production control departments in terms of quality of examinations in the frame of production control and the implementation of measures aimed at improving industrial safety at HIFs in the frame of industrial safety management system.

The state of industrial safety at supervised metallurgical and chemical recovery enterprises and industries in 2013 taking into account the reduction of accidents and injuries can be assessed as satisfactory.

In order to increase the effectiveness of supervision activities carried out by the inspectors in charge for supervision of metallurgical and chemical recovery enterprises, and to reduce the level of accidents and injuries, and ensure industrial safety at supervised metallurgical and chemical recovery enterprises, the following is required:

- pay special attention to increasing the effectiveness of functioning of the industrial safety management system in holdings and management companies; Heads of the Territorial Departments shall conduct workshops with inspectors to study changes introduced in legislation in the field of industrial safety before the entry into force of the Federal standards and regulations "Industrial safety requirements for receiving, transportation, using of ferrous and non-ferrous metal melts and melt-based alloys",

- develop guidance for inspectors on the application of technical regulations in the exercise of supervisory functions.

#### *2.2.13. Gas Distribution and Gas Consumption Facilities*

According to data reported by the territorial bodies of Rostekhnadzor, in 2013 the number of Rostekhnadzor supervised organizations operating gas distribution and gas consumption HIFs amounted to 44,605.

The length of gas pipelines in the gas distribution and gas consumption network amounted to 839, 959.6 km.

For 12 months of 2013, 40 accidents occurred at supervised gas distribution and gas consumption HIFs, which is 7 less than in the previous year (Table 70). . Also, we note a decrease in fatal accidents compared to the same period last year. In 2013 — 2, in 2012 — 19 (Tables 71). 71).

The economic damage due to the accidents occurred in 2013 exceeded 205.6 m rubles in 2012 — 192. 2 m rubles).

Most accidents occurred at gas distribution and gas consumption facilities supervised by North-Western Department of Rostekhnadzor (8 cases), Siberian Department (8 cases), Ural Department (5 cases).



Most accidents occurred in the Republic of Altai (5 cases), Vologda (3 cases), Leningradskaya (3 cases), Sverdlovsk (3 cases) regions (Table 72).

**Table 70****Root causes of accidents in 2012 and 2013**

<b>Causes of accidents</b>	<b>Number of</b>		
	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Mechanical damages of buried gas pipelines	16	20	+4
Mechanical damages caused to gas lines by vehicles	6	6	0
Damages caused by natural events	6	1	-5
Corrosion damages of external gas pipelines	2	0	-2
Breaks of welded joints	2	3	+1
Gas leak, failure of equipment at gas distribution station (cabinet-type distribution station), gas consuming equipment	4	4	0
Explosions during light-ups of gas-powered plants and boiler equipment malfunction	5	3	-2
Malfunction of liquefied hydrocarbon gas equipment	1	1	0
Other	5	2	-3
<b>Total:</b>	<b>47</b>	<b>40</b>	<b>-7</b>

**Table 71****Data of distribution of fatal accidents occurred in 2012 and 2013**

<b>Injury factors</b>	<b>Fatalities</b>				
	<b>2012</b>		<b>2013</b>		<b>+/-</b>
		<b>%</b>		<b>%</b>	
Poisoning with materials of incomplete gas combustion	3	16	2	100	-1
Air-gas mixture explosion	11	58	0		-11
Thermal impact	1	5	0		-1
Other	4	21	0		-4
<b>Total:</b>	<b>19</b>	<b>100</b>	<b>2</b>	<b>100</b>	<b>-17</b>

**Table 72****Accidents and Fatalities for 2013 by the Subjects of the Russian Federation**

	<b>Description of the Subject of the Russian Federation</b>	<b>Accident rate</b>			<b>Fatalities</b>		
		<b>2012</b>	<b>2013</b>	<b>+/-</b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Rostekhnadzor	Moscow	4	0	-4	3	0	-3
Central Department	Moscow Region	0	1	+1			
	Smolensk Region	1	0	-1			
	Tver Region	1	0	-1			
	Yaroslavl Region	1	0	-1	1	0	-1

	<i><b>Description of the Subject of the Russian Federation</b></i>	<i><b>Accident rate</b></i>			<i><b>Fatalities</b></i>		
		<b>2012</b>	<b>2013</b>	<b>+/-</b>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Upper Don Department	Voronezh Region	0	2	+2			
	Lipetsk Region	0	2	+2			
	Belgorod Region	1	0	-1	3	0	-3
Oka Department	Orel Region	0	1	+1			
	Ryazan Region	1	0	-1			
	Bryansk Region	0	0	0	0	1	+1
North-Western Department	Saint-Petersburg	1	0	-1			
	Leningradskaya Region	3	3	0			
	Novgorod Region	1	0	-1			
	Murmansk Region	0	1	+1			
	Republic of Karelia	0	1	+1			
	Vologda Region	1	3	+2			
North Caucasus Department	Krasnodar Territory	4	2	-2			
	Republic of Adygeya	1	1	0	0	1	+1
Lower Volga Department	Volgograd Region	1	0	-1	1	0	-1
	Saratov Region	1	0	-1			
Caucasus Department	Stavropol Territory	2	0	-2			
	Kabarda-Balkar Republic	2	0	-2			
	Republic of Dagestan	0	2	+2			
	Republic of North Ossetia - Alania	1	0	-1			
Western-Ural Department	Republic of Udmurtia	2	0	-2			
	Kirov Region	0	1	+1			
	Orenburg Region	1	0	-1			
	Perm Territory	1	2	+1			
	Republic of Bashkortostan	2	0	-2			
Volga Department	Republic of Tatarstan	4	1	-3			
Middle Volga River Basin (Middle-	Samara Region	1	0	-1			
Volga-Oka Department	Nizhniy Novgorod Region	0	2	+2			
	Republic of Mordovia	0	1	+1			
North-Ural Department	Tyumen Region	3	1	-2	11	0	-11
Ural Department	Kurgan Department	0	1	+1			
	Sverdlovsk Region	2	3	+1			
	Chelyabinsk Region	1	1	0			
Siberia Department	Kemerovo Region	1	1	0			
	Altai Territory	1	5	+4			
	Novosibirsk Region	1	0	-1			
	Omsk Region	0	2	+2			
<b>Total:</b>		<b>47</b>	<b>4</b>	<b>-7</b>	<b>19</b>	<b>2</b>	<b>-17</b>



**Fig. 14.** Number of accidents and fatal accidents for 2009 - 2013

In 2013, 1,585 incidents occurred at gas distribution and gas consumption facilities.

As follows from the analysis of investigation of technical and organizational causes of accidents, 20 accidents (50%) were due to mechanical damage to pipelines resulted from the impact caused by third persons and organizations; 6 accidents (16%) were due to mechanical damage of gas pipelines caused by vehicles; 1 accident (2.5%) occurred due to damage caused by natural phenomena; 3 accidents (7.5%) were caused by rupture of welded joints; 4 accident (10%) were caused by gas leaks, equipment failure at gas distribution station (cabinet-type distribution station), gas consuming equipment; 3 accidents (7.5%) were caused by an explosion while igniting gas-powered systems, and boiler equipment malfunction; 1 accident (2.5%) occurred due to a malfunction of liquefied hydrocarbon gas equipment; 2 accident (5%) occurred for other causes.

The most serious accident occurred on August 8, 2013 at "Mobile Power Plants Labytnangi" - branch of JSC " Mobile Energy" in Tyumen Region. The destruction of internal parts of generator brought about its abrupt stop resulting in the destruction of the generator and damage to gas turbine engine with ignition of oil leaked from the lubrication system. The turbine hall walls were damaged by fragments and fire.

As the result of investigation of the accident causes, the committee found that the causes which led to the destruction of parts of the generator, were:

incorrect operation of uninterruptible power supply unit providing backup power supply to automated control system, and as a result, short-term loss of power not only on the main but also on the back-up input terminal of automated control system;

failure of closing function of emergency breaker of gas turbogenerator GTG-3 upon de-energizing of normal shutdown electromagnetic valve resulting in a sharp increase in generator turbine and turbogenerator speed to a value sufficient for mechanical damage of generator.

At that gas consumption equipment was operated by the operating organization with violation of industrial safety requirements. Production control at the enterprise was unsatisfactory. The economic damage caused by the accident was 190 m rubles. (92 % economic damage of the accidents occurred in 2013).

In 2013, the highest number of accidents - 50% of the total number of accidents (in 2012 - 47%) was due to mechanical damages to gas pipelines caused by the impact from third persons and organizations. Indicators of this category of accidents evidence of weak monitoring by the gas distribution entities of safety of the existing gas distribution networks including weak monitoring of construction companies conducting excavation works in the buffer zone of gas pipelines.

So, January 15, 2013, at JSC "Lenoblgaz" two steel underground IP and LP pipelines were damaged by LLC "SpetsStroyTehnika" in process of laying down the water lines. Gas Distribution Sub-stations No. 2, 3, 6 and 62 residential houses were disconnected from gas supply. As a result of the accident investigation, the committee found that the construction company did not arrange timely calling of the gas distribution company representatives to the place of earth work in the buffer zone of the outer pipeline, works to determine the location of the pipeline by pilot trenching in the presence of the gas distribution organization representative were not performed, a departure from the requirements of the project documentation. Economic damage caused by the accident amounted to 638.6 thousand rubles. Similar accidents occurred at enterprises: JSC "Lipetskoblbgaz" (2 cases), JSC "Ekaterinburggaz", JSC "Gazprom gas distribution Barnaul" (2 cases), JSC "Gazprom gas distribution Perm" (2 cases), JSC "Vologdaoblbgaz", JSC "Vologdagaz", JSC "Lenoblgaz" (2 cases), JSC "Omskgorgaz" (2 cases), JSC "Gazprom gas distribution Petrozavodsk", JSC "Krymskkraygaz", JSC "Kurgan distribution company", OAO "Gazprom gas distribution Voronezh", a subsidiary "Gazprom gas distribution Tomsk", LLC "Gazenergoservis."

March 23, 2013, at "Murmanskoblbgaz" enterprise a section of aboveground low pressure pipeline was damaged by a front side forklift of LLC "Zvezda" performing snow removing works. Mechanical impact caused rupture of pipeline weld joint followed by the release of gas. Five residential apartment buildings (326 apartments) were disconnected from gas supply. As a result of the accident investigation the committee found that LLC "Zvezda" failed to provide timely and qualitative supervision of the work execution in the buffer zone of the gas pipeline. Economic damage caused by the accident amounted to 162 thousand rubles. Similar accidents occurred at enterprises: JSC "Nizhegorodoblbgaz", JSC "Gazprom gas distribution Barnaul."

Accident because of the rupture of welded joint occurred on May 15, 2013 at JSC "Gazprom gas distribution Barnaul" (Altai Territory). So, during a planned walkdown of inter-settlement gas pipeline, a gas leak was detected in the area from "Komsomolskaya Gas Distribution Sub-station-2" to the settlement of Solonovka. The settlement of Stukovo (637 gas consumers) was disconnected from gas supply. As a result of investigation of accident causes, the commission found that the destruction of the gas pipeline on the welded joint occurred due to the lack of fusion at the root of welded joint along the edge. Economic damage caused by the accident amounted to 201.2 thousand rubles.

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A similar accident occurred at JSC "Kurganinskragaz."

Accident due to boiler equipment malfunction occurred on November 19, 2013 at "Voronezh Mechanical Plant" - a branch of the Federal State Unitary Enterprise "State Research and Production Space Center named after M.V. Khrunichev" (Voronezh Region). . So, during routine maintenance relating to checking boiler gas shut-off and control valves, gas was released in the boiler room with further ignition which was due to incomplete closure of the main motorized valve DN 250 on gas pipeline of boiler PTVM-50 No.17 because of inaccurate settings of position switch VP-4M. Two people got thermal burns. As the result of investigation of the accident causes, the committee found that the causes which led to the accident were the following: operation of faulty equipment; operation of gas consumption equipment with violations of the industrial safety; unsatisfactory organization and implementation of production control.

April 17, 2013, a fatal accident occurred at LLC "Bryanskteploenergo" (Bryansk Region). Dead R.V. Aleinikov was found in the premise of gasified boiler house. According to the forensic medical examination, the man died of carbon monoxide poisoning.

As a result of investigation of accident causes, the committee found that the causes which led to the accident were the following:

- operation of faulty equipment; violation of the process;
- violation by the employee of labor regulations and labor discipline; lack of operation documentation;
- operation of gas consumption equipment with violation of industrial safety requirements;

unsatisfactory implementation of production control at the enterprise. Causes which have a negative impact on industrial safety at supervised facilities are the following: wrong organization of work process; violation of maintenance and repair regulations; inefficiency of production control; failure of technical devices; lack or failure of emergency protection means, alarms.

In 2013, Rostekhnadzor territorial bodies conducted 23,348 inspections of compliance with industrial safety requirements during operation of gas distribution and gas consumption facilities. 90,111 violations of codes and standards were revealed. Following the inspection results 5,852 officials and 1,400 legal persons were summoned to administrative responsibility. The amount of the imposed administrative fines totaled 357,257 thousand rubles.

Monitoring of inspections of compliance with the industrial safety requirements during operation of gas distribution and gas consumption facilities showed that the major violations are the following:

- untimely technical diagnostics; admission of unqualified personnel to works;
- violation of instructions while performing gas hazardous work; operation of the equipment with a faulty safety automation devices; violation of the terms of inspections of underground gas pipelines.

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According to Rostekhnadzor territorial bodies, 998 entities of 44,605 entities operating HIFs have established production control departments. In 2013, the operating organizations developed 52,367 measures aimed at ensuring industrial safety at HIFs. 44,000 inspections out of 44,484 prevention and monitoring inspections of production control scheduled by operating organizations in 2013 were actually carried out, which is 99% of the annual plan.

However, most operating organizations have significant drawbacks in the arrangement of production control which reduce its effectiveness, namely:

the order of decision development, making and implementation (including operational decisions) aimed at ensuring industrial safety in the light of the production control is not established, the same as the procedure for the development of action plans for localization of accidents and incidents and remediation thereof is missing;

procedure to account the results of production control when deciding on material and moral incentives for employees of operating organization which are in charge for industrial safety assurance at HIFs, etc. is not defined.

Inspections of supervised entities and facilities showed that the main issue appears to be wear and tear of the gas pipelines, engineering structures, and equipment (technical devices) that reached the end of operational life, inferior protection systems, interlocks and alarms of gas consumption equipment (installations).

The rules of security of gas distribution networks are not observed either by organizations carrying out excavation work in protected areas of gas distribution networks, or by operating organizations (JSC "Gazprom gas distribution") in terms of ensuring safety of operating gas distribution networks, which leads to accidents at facilities.

The length of underground pipelines which have exhausted its standard life is 44,663.8 km, of which those that have passed diagnostics to extend their life is 41,069.8 km, to be replaced (re-laydown) - 935.6 km, replaced in the reporting period - 414.2 km.

To perform the tasks in the field of control and prevention efforts in the frame of supervision over the availability of supervised organizations operating HIFs to perform the activities for prevention and confinement of emergency situations, the following issues are analyzed:

Availability at the entity of material and financial resources for the implementation of measures for prevention and elimination of emergency situations; creating internal professional emergency rescue units, non-professional emergency rescue units,

Contracting external entities in the absence of internal professional or non-professional emergency rescue units.

Generally, availability of supervised organizations for localizing and eliminating emergency situations is assessed as satisfactory.

For 12 months in 2013, 41,465 industrial safety review reports were considered and recorded, including: design documentation - 13,874; technical devices - 21,368; buildings and structures - 7,489; industrial safety declarations - 31; operational documents - 1,320.

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Based on the results of the analysis it is noted that most review reports are compliant with the specified requirements. However there are 2,325 cases when approvals of industrial safety review reports were denied. Major violations identified in the course of consideration of review reports are attributable to the lack of identification of the reviewed facility, information about design documents considered in process of review, analysis and evaluation of conformity of adopted design solutions, reduction in the volume of expert examination of technical devices, as well as the lack of references to regulatory and technical documentation used for guidance in process of calculation of the residual service life of pipelines, buildings and structures installed on them, etc.

The number of license applications (materials) submitted to the territorial bodies and Headquarters of Rostekhnadzor in 2013 amounted to 4,435. Following the application documentation review, 2,481 licenses were issued, 1,675 licenses were renewed, and refusals for granting licenses were given in 279 cases. There are three cases when license validity was suspended:

The major violations of licensing requirements and conditions revealed by Rostekhnadzor territorial bodies include:

- lack of service contracts between professional emergency rescue services and operating organizations,

- the absence of reserves of financial and material resources for localization and liquidation of accident consequences required to be established under the laws of the Russian Federation,

- delayed implementation of prescriptions and measures under the programs on aligning facilities with the industrial safety requirements,

- failure to comply with training and qualification procedure in the field of industrial safety for managers, engineers and technicians employed for the explosive and chemically hazardous industrial facilities.

#### *2.2.14. Explosive and chemically hazardous production facilities*

##### **2.2.14.1. Chemical sector facilities**

In 2013, Rostekhnadzor territorial bodies exercised state supervision (control) over more than 4,000 enterprises in chemical sector.

Production of basic chemical substances include: production of fertilizers and nitrogen compounds,

production of other basic organic chemicals; synthetic rubber,

production of plastics and synthetic resins in primary forms.

Chemical industry accounts for about 1,000 large and medium-sized industrial enterprises, and about 100 research and design organizations, pilot and experimental plants.

Chemical sector enterprises are located in all federal districts and in 71 subjects of the Russian Federation. The greatest development of the industry is reached in four federal districts: Volga (the share of the district in the total output of the chemical sector of the Russian Federation is 43.5%), Central (24.4%), Siberian (11.2%) and South (10.4%).

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Production facilities agglomeration processes have been widely developed in the chemical industry.

Major chemical hubs are formed in the Republic of Tatarstan and Bashkortostan, Altai, Perm and Krasnoyarsk regions, Tula, Tyumen, Yaroslavl, Nizhny Novgorod, Volgograd, Samara, Kemerovo and Irkutsk regions.

Among the cities, heavily-loaded with chemical profile production facilities, there are, inter alia, Dzerzhinsk (Nizhny Novgorod region), Novocheboksarsk (Chuvash Republic), Kirovo-Chepetsk (Kirov Region), Berezniki (Perm Territory), the Volgograd, Nizhnekamsk (Tatarstan), Sterlitamak (Bashkortostan), Nevinnomyssk (Stavropol Territory), Volzhsky (Volgograd Region), Chapaevsk (Samara Region), Kemerovo, Cherepovets (Vologda Region).

There are large corporate structures with a high concentration of production available and developing in some industries of the chemical sector. These are corporations and holding companies, such as "Sibur Holding", "Fosagro", "Eurochem", "Akron", "Uralhim", "TogliattiAzot", JSC "Bashkir Chemistry" and others, which produce about 90% of mineral fertilizers and polymer materials.

Facilities attributable to supervised chemically hazardous industrial facilities are as follows: facilities associated with the manufacture or use of liquefied ammonia and other refrigerants and cryogenic products,

facilities associated with the production of chlorine, chlorine-containing substances;

facilities associated with the production and use of concentrated acids and alkalis, as well as facilities for production of mineral fertilizers (at which insulated tanks with permanent stock of liquefied ammonia from 10 to over 30 thousand tons are concentrated);

facilities of pulp and paper industry, municipal water treatment plants, which contain up to hundreds of tons of liquefied chlorine.

In 2013, compared to 2012, the number of supervised chemical sector enterprises operating in the field of industrial safety, supervised by Rostekhnadzor, amounted to 5,693 (in 2012 - 6,685), of which 4,021 (in 2012 - 4,666) are organizations operating HIFs, including 712 (in 2012 - 857) organizations operating chemically hazardous industrial facilities, 385 (in 2012 - 469) organizations operating chlorine water treatment system facilities; 23 (in 2012 - 22) organizations operating pulp and paper production; 971 (in 2012 - 1217) organizations operating the ammonia-chillers; 460 (in 2012 - 483) organizations operating facilities producing and consuming products resulting from air separation, cryogenic and vacuum equipment, treatment of carbon dioxide (CO<sub>2</sub>); 176 (in 2012 - 182) alcohol production facilities; 70 (in 2012 - 70) oil extraction production facilities; 405 (in 2012 - 452) storages and storage and shipment basis of chemically hazardous and explosive substances; 853 (in 2012 - 923) other production facilities related to handling or storage of toxic, explosive and other substances that can form dust air mixtures or vapor gas mixtures.

The number of organizations operating chemically hazardous production facilities attributed to risk groups is as follows:

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Group 1 (main chemical profile enterprises and organizations, as well as other HIFs subject to declaring) - 340 (in 2012 - 360) organizations; Group 2 (enterprises and organizations that do not belong to Group 1, but have in their configuration facilities at which during an accident damage effects may spread beyond the boundaries of chemically hazardous industrial facilities) - 1933 (in 2012 - 2592) organizations,

Group 3 (enterprises and organizations that have in their configuration chemically hazardous industrial facilities, but they do not belong to the two previous groups above) — 1814 (1709) organizations.

Reduction in number of chemically hazardous industrial facilities may be explained by HIFs re-registration in accordance with the established hazard classes.

Increased public supervision over the state of industrial safety of chemically hazardous industrial facilities, including large chemical complexes (process facilities for producing inorganic substances and products based on ammonia, fertilizers), and their safe operation was carried out with focus placed on activation of work on improving the regulatory-technical basis (including changes to the existing industrial safety requirements in chemical industry, aimed at reducing the risk of accidents), and ensuring integrated development of technical and economic base of the enterprises (with a priority given to industrial safety aspects), as well as the implementation of comprehensive investment programs targeted to re-equipment and retrofit of existing and set-up of new cost-effective and environmentally friendly production facilities.

So, activities carried out on the territory of nitrogen and phosphorus complexes of JSC "FosAgro - Cherepovets" in Vologda Region (supervised by North-Western Department) as part of the comprehensive investment program implemented in 2013, include the following:

Operation of two fuel filling stations (gas stations) were stopped, their equipment was dismantled in accordance with the design documentation for the elimination of HIF.

Air gas pollution monitoring system was installed in the building of forging and thermal shop of mechanical repair base of JSC "FosAgro - Cherepovets"; shut-off valves were installed on alkali process pipelines (Shop Ammonia-1) in order to avoid overflow of alkali tanks.

New safety valves were installed on Steam boilers GM-50-1 (shop PVGS).

Air gas analyzers were installed in the premise of fuel oil pumping station of thermal power plant fuel system.

A project for set-up of automated process control system for the gas separation shop (Building 107) is in process of implementation at JSC "FosAgro - Cherepovets" in the framework of providing technical component of HIFs emergency stability." The above projects inter alia provides for the following:

Emergency automatic protection system for protecting equipment in the ammonia gas compression department in case of emergency;

Data acquisition equipment for recording the values of operating parameters of ammonia compressors was installed;

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The sequence of steps for actuation of ammonia compressor interlocks system was ensured through the program (algorithm) of response of emergency protection systems of the process plant.

In order to provide qualitative training of technological personnel in the field of drilling their actions in emergency situations, JSC "FosAgro - Cherepovets" completed retrofit of simulators for drilling practical skills of safe work performance under the running technological processes and equipment operation conditions in shops Ammonia-1 and Ammonia-2.

In 2013, JSC "FosAgro - Cherepovets" continued implementation of measures to bring ammonia output to 1150 thousand tons / year, and to improve the reliability, safety and stabilization of turnaround life of the ammonia shops by replacing and upgrading the machines. As part of these activities intended to ensure industrial safety and reliability of process equipment, for the purpose of providing uninterrupted supply with compressed, including inert, gases, construction of nitrogen recovery unit is in progress, as well as reconstruction of the ammonia-refrigeration system at the liquid ammonia storage.

JSC "FosAgro - Cherepovets" is accomplishing re-equipment of aluminum fluoride production facilities targeted to increase capacity to 35 thousand tons per year, and to improve the reliability and safety of process equipment operation. Re-equipment will be applied to almost all areas and departments in aluminum fluoride shop. As part of this re-equipment, reconstruction of aluminum hydroxide storage was performed. The investment project implementation started in 2011, ending is planned for mid 2015. In 2013, JSC "FosAgro - Cherepovets", in the frame of implementation of long time investment projects, took measures including the implementation of the project for construction of new energy-efficient ammonia production facility and new fertilizers production facility oriented to transition to a modern technology platform of ammonia and its products production on the basis of the best available technologies.

LLC "Balakovo Mineral Fertilizers" in Saratov Region (supervised by the Lower Volga Department) is accomplishing the investment programs including inter alia the following:

- construction of NPK-fertilizer production facility;

- construction of liquid ammonia storage;

- reconstruction of heat sources with the purpose of complete replacement of backup heat supply of the Factory (boiler house with technically obsolete boilers DKVR, model dated 1968) with a modern power boiler;

- improving the reliability and safety of energy supply of the enterprise.

In 2013, LLC "Balakovo Mineral Fertilizers" under the investment program performed works on liquidation of some its facilities including the following:

- boiler house (5 boilers DKVR, 3 boiler PTVM) with the replacement with one new boiler; liquid ammonia storage in connection with the construction of a new one;

- 2 sulfuric acid storages with exhausted standard life were decommissioned.

In 2013, JSC "Nevinnomyssky Azot" in the town of Nevinnomyssk, Stavropol Territory (supervised by Caucasus Department) commissioned a melamine production plant with capacity of 50 thousand tons per year.

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As part of investment program on technical development of JSC "Akron" located in Veliky Novgorod (supervised by Northwestern Department), in 2013, with the purpose of replacing obsolete and worn-out machines in the ammonia production facility, the 101J and 103J compressors were upgraded, and re-equipment of water recirculation system was started. To this end the exhaust gas heater on the AK-72 unit in nitric acid shop was replaced.

In 2013, JSC "Akron" (air separation department in methanol shop) decommissioned and dismantled the BR-6M air separation unit No. 4.

JSC "Akron" performed works relating to retrofit and re-equipment of existing substation power facility (GPP-100, PS-111, PS-116, PS-75, PS-50A, PS-44, PS-9, PS-10, PS -52).

JSC "Akron" is conducting phased works to implement modern local emergency warning systems intended to replace the existing ones. In 2013, the first and second stages of the activities for the implementation of the above warning systems were completed.

Also as part of the investment program oriented to introducing advanced technologies, increasing capacity and developing new production shop floors at JSC "Akron", in 2013 capital construction works were performed as follows:

A new Ammonia unit No. 4 and production area for processing nepheline and producing rare earth products were under construction,

Construction of Urea unit No. 5 with a design capacity of 1,000 tons/day of urea was completed;

Erection works were completed on methanol production facility with design capacity of 175 thousand tons / year of methanol,

As part of planned investments of JSC "Dorogobuzh" in Smolensk Region (supervised by Central Department), measures were completed to ensure safety of chemically hazardous industrial facilities:

NGS-3 nitrogen cryogenic generator No. 2 was commissioned; obsolete and physically worn-out equipment was replaced in the main production facilities;

Air conditioning unit was installed in the ammonium nitrate production area, which allows to operate the machines in summer at the design capacity;

Automated process control system was installed on UKL unit No. 2 in the weak nitric acid shop,

Activities were carried out to implement modern Automated process control system on two AK-72 units, on the ammonia unit.

In 2013, measures were implemented on chemically hazardous industrial facilities of JSC "Schekinoazot" in Tula Region (supervised by Oka Department) relating to the following:

introduction of hydrogen plant with a capacity of 26,000 m<sup>3</sup> / h (V-26),

re-equipment of hexamine and UFC shops;

introduction of concentrated methanolic formalin (KMMF-60) unit;

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reconstruction of cyclohexane oxidation workshop.

Implementation of the above projects will allow JSC "Shchekinoazot" improve emergency protection at chemically hazardous industrial facilities.

JSC "Mineral Fertilizer Factory within Kirovo-Chepetsk Chemical Works" in Kirov Region (supervised by Western Ural Department) implemented the following measures:

- re-equipment of Unit AK-72/1;

- ID fan installed on Unit AK-72 to increase the exhaust gas vacuum;

- re-equipment including installation of a new catalyst grid ignition device on Unit UKL-7,

- retrofit of steam turbine PETR-30-100 / 41-1 of gas synthesis compressor including installation of additional water condenser.

At JSC "Togliattiazot" HIFs in Samara Region (Middle Volga River Basin (Middle-Povolzhiye) Department) works were carried out:

- to overhaul Ammonia unit No. 7 (AM-76) including retrofit of process air compressors and synthesis columns to increase the daily output of the ammonia unit from 1420 to 1650 tons; to retrofit and overhaul Ammonia unit No. 2 including replacement of the reaction pipes and a catalyst to increase the daily output of Ammonia unit No. 2 from 1,100 to 1,300 tons.

JSC "KuibyshevAzot" in Samara Region implements at its HIFs the investment projects for construction of cyclohexanone production line in Shop No.35 with capacity of 140 thousand tons per year, as well as the cord fabric impregnation unit in Shop No. 77.

Enterprises supervised by Volga-Oka Department are implementing projects for renovation of the steam supply system (JSC "Dzerzhinsk Plexiglass"), and for construction of phase I of sodium cyanide producing installation of capacity 40,000 tons/ year (JSC "Corundum-Cyan").

JSC "Mineral Fertilizers" in Voronezh Region (supervised by Upper Don Department) is implementing measures to retrofit the ammonia and nitric acid production facilities. To this end, at Ammonia - 2 production facilities the works are carried out to replace the automated process control system for more reliable and efficient one enabling to increase safety level at HIF JSC "Mineral Fertilizers", plus to that I&C at hazardous facilities such as ammonia synthesis production line, liquid ammonia isothermal storage, start-up boiler house, are replaced with new I&C.

On the territory of Olympiadinsk Mineral Processing Plant in Krasnoyarsk Region (supervised by Yenisei Department of Rostekhnadzor) the works are carried out relating to construction (installation) of 6,000 t/y sulfuric acid and 18,000 t/y sulfur dioxide producing plant associated with the implementation of design solutions to substitute the method of neutralization of cyan containing tailing pulps for the SO<sub>2</sub> / air method.

HIF JSC "Sayanskkhimplast" in Irkutsk Region (supervised by Yenisei Department of Rostekhnadzor) is introducing schemes of chlorate destruction in anolyte in the production of chlorine and caustic soda, they have completed commissioning activities on the dichloroethane cracking unit, the 9th membrane electrolysis unit is under erection procedure, works are in progress to increase the capacity of PVC production facility.

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JSC "Ilim Group" (Bratsk) is conducting works on reconstruction of the pulp production facility in the scope of pilot tests. Implementation of these measures will improve the quality of products and emergency stability of these production facilities.

The entities supervised by Volga Department are implementing major projects for construction of ammonia and urea production complex (JSC "Ammonium" in Mendeleevsk, Republic of Tatarstan), construction of the distillery with capacity of 10,000 dal/day (JSC "Tatstpirom" facilities, Kazan, Republic of Tatarstan).

Meetings and consultations with representatives of State Corporation "Olympstroy" were repeatedly held on routine basis on issues concerning construction, installation and operation of Olympic facilities "Sochi-2014", including the bobsleigh track (supervised by North Caucasian Department).

In 2013, operators of chemically hazardous industrial facilities took measures to improve industrial safety in the operation of chemically hazardous industrial facilities as part of the planned measures to ensure industrial safety.

Enterprises supervised by Western Ural Department performed activities:

- to repair civil engineering structures of the Main rack No. 504 and the Main rack (three levels) No. 542, install the liquid ammonia level measuring system for checking level during the loading of tank cars ("Mineral Fertilizers", Perm, Russia),

- to dismantle Buildings 401, 402, 403 (Branch "Nitrogen" within JSC URALCHEM Holding, Berezniki, Perm Region),

- to install Carbonation columns No. 2 and No. 3, Distillation column

- No. 3, and retrofit Lime kiln No. 4 (JSC "Berezniki Alkali Works"),

- to construct a new production facility for chlorine and caustic potash production by membrane electrolysis method (LLC "Soda-Chlorate"),

- to construct and install process equipment of the unit for producing chloroform by natural gas direct chlorination method (LLC "Kirov-Chepetsk HaloPolymer" in Kirovo-Chepetsk),

- to dismantle ammonia-refrigeration units (JSC Agroindustrial Firm "Doronichi", JSC "Poultry "Kostinskaya" in Kirov Region);

- to retrofit refrigeration systems in order to transfer them from ammonia refrigerant to freon refrigerant (JSC "Udmurt Khladokombinat", JSC "Keskysky cheese plant", Udmurt Republic),

- to repair Reactor RND No.2 with replacement of the reactor vessel and a titanium liner in the shop for the production of metallurgical chromium oxide, to repair sulfuric acid storage tank in the acids storage in sodium bichromate shop (JSC "Novotroitsk plant of chromium compounds", Orenburg Region).

JSC "Mineral Fertilizers" (supervised by Upper Don Department) conducted a replacement of insulation and corrosion protection and repair work to strengthen the base plate of liquid ammonia isothermal storage. Overhaul of steam turbine PT-1 was carried out in the nitric acid (AK-72M) production facility. Works were performed to bring the nitric acid storage to the level of requirements of industrial safety regulatory documents (electrical valves, additional level gages, gas analyzers were installed).

In 2013, HIF LLC "PG Fosforit" in Leningrad Region (supervised by North-Western Department) performed overhauls of liquid ammonia storages No. 2 and 3 in order to improve their safety.

In order to implement changes introduced to industrial safety legislation in terms of HIF requirements, the following was developed:

Federal rules and regulations in the field of industrial safety "Safety Rules for chemically hazardous production facilities" (registered with the Russian Ministry of Justice on December 31, 2013, registration number 30995),

Federal codes and regulations in the field of industrial safety "Safety rules for production of chlorine and chlorine-containing mediums" (registered with the Russian Ministry of Justice on December 31, 2013, registration number 30968),

Taking into account the accomplished reconstruction and modernization of chemically hazardous industrial facilities in chemical industry, it may be concluded that technical condition of the facilities has improved. However, the progress of reconstruction is still constrained due to the lack of funding, particularly for provincial and municipal enterprises.

In context of implementation of the Plan of scheduled inspections of legal entities and individual entrepreneurs in 2013 Rostekhnadzor conducted inspections of large chemical enterprises.

Inspections were carried out at JSC "Bashkir Chemistry" (Moscow), which is a management organization having the functions of the sole executive body in respect of JSC "Bashkir Soda Company" and JSC "Berezniki Soda Plant", JSC "Gazprom Salavat neftekhim" (the town of Salavat, Republic of Bashkortostan), JSC "Redkino pilot plant" (Redkino village, Tver Region), JSC "Mineral Fertilizers" (Rossosh, Voronezh region).

The inspections revealed more than 600 violations of the federal laws of the Russian Federation, the Decrees of Government of the Russian Federation, as well as the binding regulatory documents in the field of industrial safety, including JSC "Bashkir Chemistry" - 6 violations, JSC "Gazprom neftekhim Salavat" - 320 violations, JSC "Redkino pilot plant" - 150 violations, JSC "Mineral Fertilizers" - 129 violations.

Both legal entities and officials in the above organizations were held liable for the administrative offenses.

Analysis of revealed violations of industrial safety requirements at the above enterprises showed that most of the violations is associated with a low level of technical safety in view of the ongoing aging of fixed assets, untimely replacement of worn-out process equipment, incomplete fulfillment of duties by leaders and performers of hazardous jobs.

The state of industrial safety at the supervised chemical facilities in 2013 is assessed as satisfactory; no major man-induced accidents or acts of terrorism were registered.

However, in 2013, at the enterprises of the chemical sector there were 2 accidents and 5 fatalities (in 2012, there were 6 accidents and 7 fatalities respectively).

One accident proceeded with serious consequences.

The accident took place on February 18, 2013 at branch "Plant for the extraction of vegetable oils" of LLC "Oil Extraction Plant Yug Rusi" (Kropotkin, Krasnodar Territory) on the extraction line in oil separation shop.

In the conduct of the rapeseed processing, the gasoline vapors and air got ignited at the extraction shop production premise followed with explosion and fire. As a result, the civil engineering structures of the extraction line building of oil extraction shop were destroyed, process equipment and piping of the extraction line, and air ducts of the shop ventilation system were damaged.

The main causes of accidents include:

violations of the process execution procedure parameters: High content of fine fraction in the extracted material in the form of oil cake granules prior to feeding them to the vegetable oil extraction, inadequate drainage of the solvent through extractable material, entering of hot extraction cake with a high content of solvent (gasoline) on the inclined scraping conveyor, which led to the formation of gas/vapor mixture of combustible substances (gasoline vapor and air (oxidant)) in the extraction line building and in the nearby zone of oil extraction shop, with further ignition of gas/vapor mixture from unknown source,

Non-use of individual protection means (filter masks grade "A") by the workers,

List of measures for confinement and elimination of emergency situations fails to provide for actions of personnel from the adjacent shops in the event of emergency; lack of production control of the quality of preparation of the material extracted.

Accidents occurred at hazardous industrial facilities of organizations supervised by North Caucasus and Pechora departments of Rostekhnadzor.

Fatalities occurred at hazardous industrial facilities of organizations supervised by North Caucasus, Siberian, Upper Don and Lower Volga Departments of Rostekhnadzor.

Group accident occurred at LLC "Soda-Chlorate" supervised by Western-Ural Department of Rostekhnadzor.

In 2013, there was a reduction of accidents and injuries rate at chemically hazardous industrial facilities of chemical sector.

The economic damage due to the accidents occurred in 2013 amounted to 504,199 thousand rubles. (in 2012 - 76,824 thousand rubles).

Reduction of accidents and injuries rate in 2013 (compared to 2012) at supervised enterprises of chemical complex has been achieved thanks to the increasing insistence of chemical supervision inspectors displayed towards production personnel of supervised enterprises in terms of compliance with the requirements of industrial safety codes and standards.

Comparative analysis of distribution of accidents by type of accidents and traumatic factors for 2013 and 2012 is presented in Tables 73 and 74 accordingly.



**Table 73**

**Comparative analysis of distribution of accidents by their types in 2013 and 2012**

<i>Accident</i>	<b>2013</b>	<b>2012</b>	<b>+/-</b>
Explosion	1	1	—
Fire	0	3	-3
Release of hazardous substances	1	0	+1
Depressurization of equipment	0	2	-2
<b>Total:</b>	<b>2</b>	<b>6</b>	<b>-2</b>

**Table 74**

**Comparative analysis of distribution of fatalities by injury factors in 2013/2012**

<i>Affecting factors</i>	<b>2013</b>	<b>2012</b>	<b>+ / -</b>
Thermal injury	2	5	-3
Chemical burn	1	0	+1
Intoxication	1	0	+1
Fall from height	1	1	—
Destruction of technical equipment	0	1	-1
<b>Total:</b>	<b>5</b>	<b>7</b>	<b>-2</b>

A tendency can be noticed to reduce the number of accidents, including those with traumatic factors - thermal burn, destruction of technical devices, and there is an increase in number of accidents, including accidents with traumatic factors such as chemical burns, poisoning. Distribution of generic causes of accidents and injuries is presented in Tables 75 and 76.

**Table 75**

**Distribution of generalized causes of accidents, %**

<i>X</i>	<b>2013</b>	<b>2012</b>	<b>Dynamics</b>
<b>Technical causes</b>			
Unsatisfactory technical condition of the equipment	0	11.1	-11.1
Failure, (unavailability) of means of emergency shutdown ,	0	11.1	-11.1
Deviations from the requirements of design, process documentation	75.5	44.5	+31.0
Violation of repair works regulations or their quality	0	11.1	-11.1
Using in technical devices of structural materials or parts not in line with design	25.5	22.2	+3.3
<b>Organizational causes</b>			
Improper organization of works	0	30.8	-30.8
Inefficiency of production control	50	46.1	+3.9
Violation of process and labor discipline	50	23.1	+26.9
Low level of knowledge of industrial safety requirements			
Careless or unauthorized actions of performers			
Other causes			

**Table 76*****Distribution of generalized accident causes, %***

X	2013	2012	Dynami
<b><i>Technical causes</i></b>			
Unsatisfactory technical condition of the equipment	29.5	0	+29.5
Failure, (unavailability) of means of emergency	0	16.7	– 16.7
Process inadequacy or design shortcomings	0	0	—
Deviations from the requirements of design, process documentation	70.5	66.6	+3.9
Lack of automation of hazardous operations, work mechanization rate	0	0	—
Inconsistency of design solutions with production and safety assurance conditions	0	0	—
Violation of examination or maintenance regulations for technical devices	0	0	—
Violation of repair works regulations or their quality	0	0	—
Presence of latent defects or ineffectiveness of incoming inspection	0	0	—
Using in technical devices of materials/ parts not in line with the design	0	16.7	– 16.7
<b><i>Organizational</i></b>			
Improper organization of works	23.2	28.6	-5.4
Inefficiency of production control	49.4	42.8	+6.6
Violation of process discipline	25.4	28.6	-3.2
Low level of knowledge of industrial safety requirements	0	0	—
Careless or unauthorized actions of performers	0	0	—
Other causes	0	0	—
Willful damage of technical devices with the purpose of their stealing	0	0	—
Drunkenness of work performers	2.0	1.0	+1
External effect	0	0	—
Natural phenomena	0	0	—

The state of industrial safety at the supervised chemical facilities in 2004-2013 is assessed as satisfactory; no major man-induced accidents or acts of terrorism were registered (Table 77)

**Table 77*****Dynamics of accident and fatality rate***

	<b><i>Number of accidents and fatal accidents for 2004 - 2013</i></b>									
	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Accidents	11	9	7	10	11	7	12	8	6	2
Fatalities	15	10	10	18	20	9	7	3	7	5

Organizational causes of accident were: Inefficiency of production control (50%), violation of technological and labor discipline (50%).

Technical causes of accidents were: Deviations from the requirements of design and process documentation, inefficient quality control of raw material (extracted material).

In 2013, more than 136 incidents occurred at chemical profile facilities. The main causes of incidents are attributable to failure or damage of technical devices and deviations from the normal operating mode in conducting technological processes, aggravated by heavy worn-out of machine fleet and lack of the servicing personnel control of machines condition during operation, routine maintenance and overhauls.

The largest number of incidents were recorded at supervised facilities as follows:

West-Ural Department (6 incidents): LLC "Soda-Chlorate"; (Branch "Nitrogen" within JSC URALCHEM Holding, Berezniki;  
JSC "Kamteks-Khimprom"; JSC "Mineral Fertilizers"; JSC "Promhimperm"; JSC "Permalko");

Caucasus Department (42 incidents); Central

Department (36 incidents); Upper Don

Department (20 incidents); Lower Volga

Department (13 incidents); North-Western

Department (7 incidents), Volga-Oka Department (5 incidents).

Despite the achieved stabilizing of the overall level of occupational injuries and accident rate at chemical sector enterprises, the state of fixed assets (wear up to 80%) determines the potential danger of chemical-processing facilities, causing a negative impact on the overall level of industrial safety of chemically hazardous industrial facilities.

In this regard, a key element in ensuring the prevention of accidents and injuries is production control influencing the level of industrial safety at the organizations. The effectiveness of production control system is assessed by the state of industrial safety level of the organization. Major production organizations and vertically integrated companies that actively deploy the industrial safety control systems and production control systems demonstrate favorable situation with the status of the industrial safety, accident and injury rates. Regular production control departments were formed at these enterprises. These include, for example, as reported for 2013, 5 enterprises supervised by Oka Department of Rostekhnadzor (JSC "Novomoskovskiy Azot", JSC "Shchekinoazot", LLC "Procter & Gamble-Novomoskovsk", JSC "Plastic", LLC "Novomoskovskiy Chlorine"), 11 companies supervised by Western-Ural Department of Rostekhnadzor (JSC "Mineral Fertilizers", JSC "Perm HaloPolymer", LLC "Novogor-Kama", JSC "Kamteks-Khimprom", JSC "Sorbent", JSC "Berezniki Soda Plant", JSC "Perm Meat Processing Plant", JSC "Permalko", JSC "Metafrax", "Nitrogen" - branch of JSC "URALCHEM Holding").

Water treatment enterprises operating large liquid chlorine storages, also have developed and implemented industrial safety management systems, for example:

Municipal Unitary Enterprise "Production Association of Water Supply and Sanitation", Chelyabinsk (Ural Department of Rostekhnadzor).

Small enterprises have persons appointed by orders in charge for the organization and implementation of production control.

Supervised organizations submit production control reports to Rostekhnadzor territorial bodies at a stated time.

However, as for operation of HIFs with small number of operational staff, which is characteristic for organizations that have a small total workforce, work on the implementation of production control does not fully meet the requirements. Organization of work on such HIFs requires further improvement, including improvement of methodological support.

During the reporting period, Yenisei Department carried out routine inspections of production control organization at the entities, such as "Ilim Group" - Branch of LLC "Irkutsk Khladokombinat", LLC "Angarsk plant of building materials", LLC "Angarsk Nitrogen Fertilizer Plant", JSC "Usolye - Siberian Himfarmzavod", LLC "Sibhimprom", JSC "PO" Usolmash", Federal Treasury Institution "Lena" Center, LLC "Bratskvodsistema."

The inspections revealed more than 10 violations of the rules of the organization and implementation of production control, as reflected in the statements of order and shall be eliminated in a timely manner.

In 2013, supervised enterprises carried out activities in the frame of re-registration of chemically hazardous industrial facilities in the state HIF register with regard to the hazard class of the facility.

The industrial safety review is an efficient instrument for enhancing industrial safety of hazardous industrial facilities (taking into consideration wearing of fixed assets), making it possible to analyze the probable causes and factors contributing to the initiation and development of emergency situations, forecast the accident consequences and based on that develop preventive measures for enhancing operational safety of hazardous industrial facilities.

The volume and quality of expert assessments of the state of industrial safety provides reliable data on technical condition of production facilities, as evidenced by the results of control and supervisory work carried out by Rostekhnadzor territorial bodies. The number of industrial safety reviews in recent years has stabilized, most of them are attributable to technical diagnostics of technical devices in order to determine the remaining operational life of process equipment and piping.

In 2013, Rostekhnadzor territorial bodies reviewed 31,013 industrial safety review reports specific to chemical sector enterprises. Out of these, 29,314 reports were approved, and approval was denied for 1,699 reports (which is more than 5%).

Common characteristic shortcomings established during registration of industrial safety review reports in the reporting period is inconsistency of documents execution with the requirements of regulatory (standards) technical documentation (45%), failure to comply with the established scope of work provided by the program of industrial safety review (30%), mismatch of work scope to the developed examination methods (25%).

The largest number of refusals to grant approval of industrial safety review reports was in Central Department (359), Lower Volga Department (203), Volga Department (223), Ural Department (131), Yenisei Department (129).

In general, the scope and quality of the expert assessments of industrial safety state provide reliable data on technical condition of chemically hazardous industrial facilities.

HIF Operators provided liability insurance for damage resulting from HIF operation, insurance contracts are concluded in a timely manner and prolonged in the prescribed manner.

However, in 2013, supervised by Western-Ural Department, Perm branch of FSUE Russian Research Center "Applied Chemistry" failed to formalize mandatory insurance of civil liability for damage resulting from an accident or incident at HIF (contract validity expired on January 23, 2013). With regard to the Perm branch of FSUE RSC "Applied Chemistry", administrative proceedings were instituted under the Code of Administrative Offenses, a decision is made about the imposition of an administrative fine in the amount of 500 thousand rubles.

According to information from Rostekhnadzor territorial bodies in 2013, chemically hazardous facilities are adequately protected, they are guarded and defended both by the units of the Army and the Ministry of Internal Affairs, and by specialized security guard organizations.

For example, JSC "Brewing Company Baltika", Branch "Baltic Pikra" (supervised by Yenisei Department) has its HIF area fenced with metal fence made of sheet metal profile 3 m in height, reinforced with barbed wire on top. Security of the facilities intended to protect them from potential wrongdoing and access control is provided by a security company LLC "AN-Security" under the contract.

11 CCTV cameras are installed around the perimeter, the entire perimeter can be viewed without dead zones.

Measures for preventing outside unauthorized intervention in the on-going processes, countermeasures against acts of terrorism and measures for protection of facilities are being developed at chemically hazardous facilities.

According to territorial bodies of Rostekhnadzor, the access control got more stringent, suspicious and bulky items are not allowed for carrying inside the perimeter.

At some chemically hazardous facilities, entry road to the facility is recorded by cameras around the clock. Sub-contractors' employees may pass according to the lists approved by the heads of the enterprises. The rooms in which there is no permanent presence of personnel, are closed and checked at rounds.

At enterprises communication and interaction is arranged (in preparation for unforeseen situations, i.e. a sudden attack of terrorists) with the Federal Security Service of Russia, Ministry of Internal Affairs, the EMERCOM of Russia, fire units, medical institutions both on subcontract basis, and in an expeditious manner using both telephone and mobile radio communication through the dispatching services and staff on duty.

Chemically hazardous production facilities implement comprehensive measures to ensure protection from intrusion.



Implementation of scheduling of emergency response drills with the staff, availability of individual and collective protection means for personnel, firefighting means at the enterprises also increase the emergency stability of hazardous industrial facilities.

Checks of situation with the development and implementation of measures for protection of facilities against acts of terrorism are regularly held by Rostekhnadzor territorial bodies as part of target and comprehensive inspections.

Significant shortcomings relating to security and access regime are revealed at enterprises operating ammonia-chillers supervised by Volga Department (JSC "Holod", JSC "Kazan Oil Factory", JSC "Margaushsky Dairy Plant", LLC "Dairy business - Alaty" JSC "PROSTO MOLOKO", located in the Republic of Tatarstan).

In 2013, Rostekhnadzor territorial bodies carried out 4,665 (in 2012 - 3,851) inspections of chemical sector enterprises, as the results of which they issued statements of order to eliminate violations of industrial safety requirements, which makes in number 18,234 (in 2012 - 22,255). 1,692 (in 2012 - 1,779) administrative penalties were imposed for violations of law and the requirements of regulatory documents pertaining to industrial safety assurance. The amount of the fines totaled 83,214 thousand rubles. (in 2012 - 104,302 thousand rubles).

Analysis of violations of industrial safety requirements for the above enterprises showed that most of the violations is associated with violations during the operation of process equipment (including dynamic and process pipelines), controls, control and emergency protection and automation during explosion and chemically hazardous processes. The overwhelming part of the violations is related to handling hazardous substances featuring peaky directional effect mechanism.

The achieved level of effectiveness of supervisory activities and the reduction of accident rate may be explained by increased insistence of inspectors towards violators of industrial safety requirements at supervised facilities, as well as continuous systematic follow-up maintained by inspectors of on-time fulfillment of statements of order issued by Rostekhnadzor territorial bodies.

So, in 2013, violations noted in Rostekhnadzor statements of order in 2011 were fully eliminated at JSC "Cherepovets Nitrogen", JSC "Ammophos", LLC PC "Agro-Cherepovets", LLC "Balakovo Mineral Fertilizers", JSC "Apatite", JSC "Dorogobuzh".

Accident resistance of the supervised chemical enterprises is ensured through a set of relevant organizational and technical measures: the use of automated process control systems, regular monitoring of hazardous substance content in the working area air, development of accident localization and elimination plans, preventive work, alert drills, establishment of non-professional emergency rescue teams at the facilities.

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Analysis of the progress of actions suggests that the work carried out by supervised entities and facilities in terms of providing forces and resources needed for localization and liquidation of accidents ensures the proper level of readiness of the production staff for elimination of emergency situations.

Supervised chemical profile enterprises, depending on the hazard classes of operated chemically hazardous industrial facilities, have internal gas rescue teams or enter into service contracts. Large entities (facilities hazard class I or II) tend to have permanent professional rescuer teams, which are equipped with special machines, equipment, tackling, tools and materials.

Each structural unit of chemical sector enterprises has non-professional emergency response team formed of its employees that may be involved in emergency response in accordance with the Accident elimination plan.

For acquisition of practical skills in safe work performance, prevention of accidents and mitigation of their effects, all engineers and technicians at enterprises directly involved in the implementation of technological processes and operation of machines at these facilities have training sessions and practical skill drills to master processes and systems relating to control, start-up, routine and emergency shutdown in standard and specific abnormal and emergency situations.

In 2013, training sessions (drills) with the production personnel were conducted on monthly basis in accordance with the annual schedule approved by the general managers of organizations operating chemically hazardous industrial facilities.

For example, HIF JSC "Akron" (supervised by North-Western Department) held more than 12 alert drills with shift production personnel in accordance with the items in the operational part of the Accident elimination plan (methanol, nitric acid, formaldehyde and urea resins, biological treatment plants, ammonia production shops).

In 2013, organizations supervised by Western-Ural Department of Rostekhnadzor planned and conducted drills with the purpose to train the staff and check the actions of senior management. LLC "Soda- chlorate" carried out 9 drills at its facilities, as well as a comprehensive exercise jointly with the Ministry of Internal Affairs of Russia, the EMERCOM of Russia, the Federal Security Service of Russia and local governments. Branch "Nitrogen" of JSC URALCHEM Holding carried out in manufacturing shops 32 drills under the Accident elimination plans. 12 emergency drills under the Accident elimination plans in accordance with the schedules were carried out at the facilities of JSC "Mineral fertilizer plant KChKhK" and LLC "Kirov-Chepetsk HaloPolymer" (Kirov-Chepetsk).

Western-Ural Department in Perm Territory in October 2013 jointly with commission of Unified Russian State System for Emergency Prevention and Elimination in Perm Territory took part in exercises at ammonia refrigeration system HIF of JSC "SUN InBev" (Perm).

Organizations with a small number of production staff (e.g., ammonia-refrigeration units) enter into service contracts with Russian EMERCOM Fire Service.

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Chemical enterprises created reserves of financial and material resources.

However, inspections carried out in 2013 by Rostekhnadzor territorial bodies revealed that a number of enterprises had no signed service contracts with professional emergency rescue companies or teams and had no internal rescue teams (Perm branch of FSUE "Russian Research Center "Applied Chemistry").

The list of open issues common to functioning of professional emergency rescue companies and teams providing services to supervised enterprises and facilities includes the lack of rescue equipment and facilities, in particular this applies to non-professional emergency rescue teams.

According to the reports of Rostekhnadzor territorial bodies, in 2013, HIF declaring activities are assessed as satisfactorily and were connected with the revision of industrial safety declarations of chemical sector enterprises and were performed in a timely manner, also such activities are related to performing activities specified in safety declarations and aimed at improving industrial safety at chemically hazardous industrial facilities.

In 2013, the chemical sector facilities developed more than 20 industrial safety declarations, which are registered in the prescribed manner. However, there were deviations in registration of certain industrial safety declarations, namely the absence in them of findings of EMERCOM of Russia, e.g. JSC "FOSAGRO Cherepovets" in Vologda Region (North-Western Department), LLC "Metadynea" in Moscow Region (Central Department), JSC "Chelnyvodokanal" in the Republic of Tatarstan (Volga Department).

The procedure for licensing chemically hazardous industrial facilities provides for effective influence on the state of industrial safety and makes it possible to prevent professionally unprepared organizations from carrying out the activity at hazardous industrial facility. On the whole, licensing practice demonstrates that holding of licenses disciplines the organizations, raises personal responsibility of managerial staff for solving technical issues aimed at modernization of equipment and processes.

In 2013, Rostekhnadzor territorial bodies granted 165 licenses for operation of explosion and chemically hazardous industrial facilities within chemical sector, reissued 189 licenses for operation of explosion and chemically hazardous industrial facilities within chemical sector, refused to grant licenses to 38 organizations operating explosion and chemically hazardous industrial facilities. In 2013, no procedures for suspension of license for operation of explosion and chemically hazardous industrial facilities within chemical sector were implemented by Rostekhnadzor territorial bodies and, accordingly, cancellation of licenses by the court was not registered.

Verification of licensing requirements and conditions is an important element of industrial safety management and a strong arm forcing enterprises to meet industrial safety legislation requirements.

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In 2013, Rostekhnadzor territorial bodies conducted 328 inspections of compliance with licensing requirements and conditions of the chemical sector facilities, as a result, 1,137 violations of license requirements were revealed. The amount of the imposed administrative fines totaled 4,399 thousand rubles.

Major violations include such as: licensing requirements stipulated by Regulations on licensing of explosion and chemically hazardous industrial facilities hazard class I, II and III are not observed by organizations operating explosion and chemically hazardous industrial facilities within chemical sector.

So, in June 2013, the license inspections carried out by Western-Ural Department of Rostekhnadzor revealed that Perm Branch of FSUE "Russian Research Center "Applied Chemistry" (Perm) performs licensed activity without a license to operate explosion and chemically hazardous industrial facilities hazard class I, II and III since the existing license validity had expired, and the license was not reissued in the prescribed manner. Furthermore, Perm Branch of FSUE Russian Research Center "Applied Chemistry" does not eliminate in a timely manner the violations specified in the statements of order previously issued by Western-Ural Department of Rostekhnadzor (e.g., Statement of order No. 2815 / P dated October 31, 2012, for which only 1 item of 14 violations revealed was improved by its deadline). Based on the results of inspection of the legal entity Perm Branch of FSUE Russian Research Center "Applied Chemistry", the administrative proceedings were initiated, in accordance with the Code of Administrative Offenses of the Russian Federation a decision on administrative fine in the amount of 700 thousand rubles was issued. However, HIF Perm FSUE RSC "Applied Chemistry" has in storage more than 100 tons of liquid waste being a mixture of perfluorocyclohexanedicarboxylic acid difluorides hazard class II.

The results of analysis of supervisory work carried out by territorial bodies prove that supervised facilities do not implement in the required scope the new highly effective and safe technologies, the process of substitution of technical devices (equipment, I&C, emergency protection means, electrical and other equipment) with expired standard service life for new and more efficient items is still at slow pace (as noted, in most cases, considering the results of industrial safety reviews decisions are taken to extend the life).

The basic problems related to industrial safety assurance include frequent change of owners (managers and specialists), inefficient performance of production inspection services, significant wear of the basic production assets, insufficient financing of technical re-equipment, reconstruction, and modernization programs of operating production facilities. This is confirmed by the results of inspections of large mineral fertilizers producing enterprises.

Implementation of measures to ensure HIF chemical safety is primarily aimed at solving problems related to ensuring protection of the vital interests of the individual and society from accidents at HIFs, and the consequences of such accidents.

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Key approaches to reducing chemical hazards at numerous facilities are based on the principles of natural safety inherent in the facilities themselves, but also on reducing the volumes of hazardous substances, replacing the substances with less hazardous substances, using substances in less hazardous aggregate state, designing facilities with the lowest level of complexity that are less sensitive to the errors or unauthorized actions, introducing modern means of protection, control and accident stability.

Also, the main methods of ensuring chemical safety of HIF production staff include: emergency prevention, organization of production personnel protection, reducing the effects of accidents associated with exposure to hazardous substances, as well as preservation and (or) elimination of chemically hazardous industrial facilities.

To this end, in the frame of implementation of measures envisaged for the development of water supply and sewerage systems of the city of Moscow, in order to exclude highly toxic liquid chlorine from circulation, the process lines for water disinfection with sodium hypochlorite were commissioned at Western water treatment plant of Moscow State Unitary Enterprise "Mosvodokanal" (supervised by Interregional Technological Department). At the same time, liquid chlorine transportation by rail on the territory of Moscow Region was reduced, safety and reliability of water supply systems was improved, risks of emergencies were reduced. Northern and Rublevskaya water treatment stations were also transferred to technology based on the use of sodium hypochlorite. Advanced and safer membrane process for commercial liquid chlorine production is being introduced by LLC "RusVinyl", Nizhny Novgorod Region (supervised by Volga-Oka Department) in the frame of construction of polyvinyl chloride (PVC) production complex, which configuration includes process lines for chlorine and caustic soda production using membrane electrolytic process, vinyl chloride monomer production, polyvinyl chloride emulsion and suspension production. In addition to the main production building construction, works are carried out to construct and reconstruct auxiliary plants and infrastructure facilities (e.g., air separation plant, rail access, treatment engineering structures, Combined Heat Power Plant facilities).

At JSC "Khimprom" in Volgograd (supervised by Lower Volga Department), a number of organizational and technical measures is being implemented targeted to stopping, conservation and liquidation of JSC "Khimprom" facilities taking into account moral and physical deterioration of the process equipment, buildings, structures, engineering and transport infrastructure, in context of the enterprise restructuring (including production lines of inorganic chlorine-containing compounds, benzyl cyanide, as well as wastewater storage "White Sea"). Given the need to correct industrial safety violations following Rostekhnadzor statements of order, JSC "Khimprom" developed a short and medium term program of measures to improve industrial safety at HIFs in order to prevent accidents, man-caused catastrophes and other events.

Measures in the frame of reconstruction of the process and infrastructural facilities of JSC "Baikal Pulp and Paper Mill" (Irkutsk region) are in process of implementation, including phased liquidation of the enterprise, which suspended its operations in September 2013.

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In 2013, in meat and dairy industries at ammonia refrigeration systems, measures were implemented to reduce ammonia consumption.

For example, JSC "Apatity Dairy Factory" (Murmansk Region) transferred its direct cooling system to freon consumption, JSC "Borovichsky Dairy Plant" (Arkhangelsk Region) switched from ammonia refrigerant to sodium hypochlorite refrigerant. Ammonia-refrigeration system of JSC "Novgorod Khladokombinat" (Novgorod region) is removed from the State HIF Register due to its liquidation.

In accordance with the established procedure measures were taken to liquidate ammonia-refrigeration systems at JSC "Azov Bayern" (Yeisk, Krasnodar Region) and JSC "Nestle Kuban" (Timashevsk, Krasnodar Territory).

JSC "Usoliekhimprom" in Irkutsk Region (supervised by Yenisei Department) due to unprofitability deactivated HIFs of acetylene and chlorine groups, deactivation of facilities was performed in compliance with industrial safety requirements.

Municipal Unitary Enterprise Heating networks in Zelenogorsk, Krasnoyarsk Territory, transferred its pumping and filtration station to water disinfection process using combined disinfectant "Chlorine dioxide and chlorine," produced at the plants like "DH- 100". Chlorine is removed from the Chlorine storage.

Chlorine accidental release neutralization equipment and water curtain protection systems of Tatyshchev and Lower Atamanovsky (Krasnoyarsk Territory) chlorination islands were installed.

JSC "Krasnokamensk grid" in Krasnoyarsk Territory transferred a chlorine warehouse of chlorination treatment plant and a chlorination station of sewage treatment plants to an alternative water disinfecting method with the use of plants "AQ-500" and "AQ-100", respectively.

In context of moving from ammonia to freon, re-equipment projects were implemented at the facilities of LLC "Synthesis OKA" (Dzerzhinsk, Nizhny Novgorod Region), in particular, re-equipment of refrigeration supply system of the second ethanolamine shop and herbicide shop, and at facilities of JSC "Himsorbent" (Dzerzhinsk, Nizhny Novgorod Region), namely re-equipment of refrigeration supply system of methyldiethanolamine and glycol acetates production sites. In 2013, Municipal Unitary Enterprise "Astrvodokanal" in Astrakhan carried out works relating to construction of the UV wastewater disinfection system at the Northern sewage treatment facilities in order to stop using ammonia as a refrigerant.

Enterprises operating chemically hazardous industrial facilities to be declared (facilities hazard class I and II) established (in process to establish) Industrial safety management systems through which the continuous process of impacting industrial safety is implemented oriented to anticipate, prevent and eliminate accidents and incidents, as well as injuries to HIF employees. The large chemical holdings (e.g., JSC "URALCHEM Holding", JSC "MCC EuroChem") has developed Industrial safety management systems which are common to all enterprises of chemical holdings.

According to the reports of Rostekhnadzor territorial bodies, Industrial safety management systems are developed at chemically hazardous industrial facilities of LLC "Soda Chlorate", "Nitrogen" - Branch of JSC "URALCHEM Holding", JSC "Solikamskbumprom" (Western-Ural Department of Rostekhnadzor), JSC "KuibyshevAzot" (Middle Volga Basin Department of Rostekhnadzor), JSC "NAK Nitrogen" (Oka Department of Rostekhnadzor).

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In the food and dairy industry and other enterprises, Industrial safety management system is an integral part of OHSAS, for example, at "Perm Dairy Plant" - Branch of JSC "Company UNIMILK" (Perm), JSC "SUN InBev" (Perm) - Branch of JSC "Sorbent" (Perm), JSC «Solikamsk Factory Ural"(Solikamsk), JSC "Perm Khladokombinat Sozvezdie" (Perm), JSC "Perm Margarine Plant" (Perm). Problems associated with industrial safety during operation, modernization, overhaul, deactivation and liquidation of chemically hazardous industrial facilities, as well as the application of advanced technical standards at the chemical sector facilities require constant monitoring and supervision by inspectors of territorial bodies and industrial departments of Rostekhnadzor Headquarters.

The main spheres of work to improve supervision over chemical sector enterprises are to increase the level of industrial safety at chemically hazardous industrial facilities, maintain at the same level, and further decrease the risk of accidents which is reached due to:

- improvement of efficiency of supervision, control and permitting activities in combination with statistical and analytical approaches and qualitative evaluation of the results (first of all in regard to facilities hazard class I and II); improvement of management of database and control and supervision files for supervised enterprises;

- enhancing practices relating to scientific approach to problems of industrial safety of chemically hazardous industrial facilities in terms of organization dealing with risk analysis and calculations;

- improving the effectiveness of impact of territorial bodies on production control functional units and industrial safety management system at supervised chemical sector enterprises;

- monitoring of the implementation of investment programs on modernization and (or) reconstruction of the facilities developed taking into account financial and organizational support from local authorities in terms of security (within the competence);

- monitoring of the actual execution of plans, programs and schedules to ensure industrial safety at chemical sector enterprises and prospects of development and introduction of modern technologies at chemically hazardous industrial facilities (including the replacement of worn-out equipment and obsolete technologies that reduce the amount of the hazardous chemicals and use less hazardous chemicals and (or) the substances in the less hazardous condition).

#### **2.2.14.2. *Defense-industrial sector facilities***

Defense-industrial sector HIFs are: facilities for the safe storage and elimination of chemical weapons; facilities associated with the production of explosive substances, propellants, missile fuels and products containing thereof;

enterprises and facilities associated with loading and industrial disposal of ammunition, missiles and their components;

Roskosmos enterprises and facilities.

Most defense-industrial sector enterprises are located in the following regions of the Russian Federation: Republic of Tatarstan and Bashkortostan, Altai and Perm regions, Moscow, Leningrad, Chelyabinsk, Amur, Sverdlovsk, Novosibirsk, Tula, Nizhny Novgorod, Samara and Bryansk regions, which imposes a special responsibility on the administration of these regions and relevant departments (management companies). The total number of defense-industrial sector enterprises operating HIFs is more than 350, most of which is under the jurisdiction of the

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Ministry of Industrial trade of Russia , State Corporation "Russian Technologies", State Corporation "Rosatom", and Roskosmos.

In accordance with the requirements of the Federal Law No. 22-FZ dated March 4, 2013 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", specific legislative acts of the Russian Federation and on invalidation of sub-item 114 of item 1, article 33333, Part 2 of the Tax Code of the Russian Federation", the majority of defense-industrial sector enterprises carried out identification and re-registration procedures for HIFs and assigned the relevant hazard classes to them.

The total number of HIFs in the defense-industrial sector amounts to 487, of which 47 - facilities for safe storage and elimination of chemical weapon (hazard class I - 15 HIFs; hazard class II - 6 HIFs; hazard class III - 17 HIFs; hazard class IV - 9 HIFs).

A continuous state supervision regime established at defense-industrial sector HIFs hazard class I provides for Rostekhnadzor measures to monitor compliance of enterprises operating extremely high risk HIFs with mandatory requirements specific for their operation.

Control and supervision activities to monitor the state of industrial safety of defense-industrial sector HIFs and their safe operation carried out in 2013 were oriented to activation of works on re-equipment and modernization of existing enterprises and set-up of new cost-effective and environmentally friendly production facilities.

In this context, the problem remains unresolved regarding the improvement of effectiveness of the Federal state enterprise (FSE) "Kazan State treasury gunpowder factory", as well as assessment of further prospects of its development. Major activities to improve the effectiveness of the enterprise are based on the assumption to withdraw people from the hazardous zone (FSE "Kazan State treasury gunpowder factory" is located in the city of Kazan), re-equipment of pyroxylin powders production line, creating a facility for production of new forms of cellulosic feedstocks, modernization (rehabilitation) of worn-out machines, civil engineering structures and communications of major productions.

As part of activities implemented under the program "National system of chemical and biological safety of the Russian Federation (2009-2014)",

including those relating to processing explosives produced for defense and industrial purposes:

FSE "Aleksin chemical plant" (Tula region) is carrying out organizational and technical activities related to urgent elimination of hazardous facilities;

FSUE Production Association Krasnoyarsk Chemical Plant "Yenisei"

(Krasnoyarsk) implements measures to eliminate facilities that contain chemically hazardous substances, including dioctyl phthalate;

Rezhev chemical plant (Sverdlovsk region) has completed individual stages of the job on decommissioning hazardous facilities.

In 2013, hazardous industrial facilities in the defense-industrial sector reported about 2 accidents and 3 fatalities (in 2012, one accident was registered and no fatalities) (Table 78, 79).

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**Table 78*****Accidents per facilities for 2011 -2013***

<b><i>Facility</i></b>	<b><i>2011</i></b>	<b><i>2012</i></b>	<b><i>2013</i></b>
Chemical weapon elimination	—	—	—
Defense-industrial sector	—	1	2

**Table 79*****Injuries per facilities for 2011 -2013***

<b><i>Facility</i></b>	<b><i>2011</i></b>	<b><i>2012</i></b>	<b><i>2013</i></b>
Chemical weapon elimination	—	—	1
Defense-industrial sector	—	—	3

January 30, 2013, in cabin No. 3, Building 202, "Krasnoarmeysky Research Institute of mechanization" (JSC "KNIIM"), Krasnoarmeysk, Moscow Region (supervised by Central Department) the accident occurred in the form of an explosion and fatality (press operator for special products, 6<sup>th</sup> level).

After completion of pressing operation on one of the work pieces, the press operator entered the cabin where the hydraulic press machine is located to remove the pallet from the munition body filled with explosives (OMA).

After a few minutes a puff occurred in the cabin.

The cause of the accident was an explosion of an explosive-filled warhead body of the product which was part of the assembly for pallet removal.

Technical cause of the accident (explosion) was a mechanical effect on the explosive due to the inertial movement of the pallet.

As organizational causes of the accident the following is defined:

violation of process and design documentation (the work was carried out on the workplace not specified for this operation);

shortcomings in the implementation of production control.

The accident in Cabin No. 3, Building 202, JSC KNIIM resulted into destroyed propelling surface, partially damaged equipment and tooling of press machine.

The economic damage was 490,179 rubles.

On May 30, 2013, a fatality occurred in the branch of the Federal State Enterprise "Federal Department for Safe Storage and Elimination of Chemical Weapon."

When washing a 63 m<sup>3</sup> drained tank for potassium hydroxide through a manhole using a hose with water, the workers decided to remove the remaining sediment mechanically from inside the tank. A worker, wearing a gas mask filter and A-1 set, went into the tank. The other worker, which stayed outside, 2-3 minutes after heard the sound from the tank and called a gas rescue team and a medical team on duty.

The duty gas rescuers pulled the victim out of the tank, the duty medical team after resuscitation procedure have ascertained the fact of death.

According to the expert opinion of a health care institution, the worker, when in confined space of tank and moving in it, stumbled on a vertically mounted tube of level gage, in the result of which he got damages - abrasion in front of the head and closed brain injury, and then he fell to the vessel wall, where from a low partial pressure of oxygen in the environment he got mechanical asphyxia, which was the cause of death.

According to the results of the technical investigation, the causes of the accident were: unsatisfactory organization of work procedure, namely the absence of control by the officials responsible for the safe conduct of the work; violation by the employee of process manual and labor discipline, that is his independent decision-making to proceed with cleaning the tank and descending inside the tank without manager consent, and without being instructed and trained for this type of work, without the necessary protective equipment and without work permit.

October 24, 2013, in Building 910, Shop No. 20, FSE "Kazan State treasury



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gunpowder factory" (FSE "KGKPZ"), Kazan (supervised by Volga Department of Rostekhnadzor), an accident occurred in the form of fire.

The accident occurred during manufacturing process for the production of nitroenamel grade NC-132.

Workers wearing overalls without synthetic fibers started to perform the loading operation to load the substance into the mixer. Having checked on the liquid counter that toluene feeding value is 1.2 tons, the two workers started to load the filler - microcrystalline barium sulfate from bags weighing 40 kg each, made of polypropylene fiber. After the filling from the second bag was loaded, flames escaped with a puff from the loading door of the mixer. The senior worker quickly shut the loading door, but the flames were drawn into the air duct of connected extraction ventilation system, which contributed to the spread of fire.

Two hours later the fire brigade extinguished the fire.

In the result of fire one female worker got a flame burn of the scalp, face, neck, both forearms, hands, grade 1-2 on the area of 10% of the body surface, thermal burn of eyebrows and eyelashes grade 1-2.

Consequences of the accident: electric drivers of mixer were burnt, pipelines for transporting liquid components were deformed (twisted), paint on the walls and ceiling of the room and on machine surface was burnt, extraction ventilation ducts burned, window frames burned.

The most probable cause of the accident was uncontrolled instant ignition of toluene vapor (air/vapor mixture) due to electrostatic discharge resulting from the friction of the particles of barium sulfate fine powder against polypropylene bag during its pouring into the mixer or when shaking the empty bag.

On the basis of technical documentation, accident place investigation, interrogation of witnesses and officials, the commission on technical investigation of the causes of the accident has established the following:

- formation toluene vapor /dust combustible film on the inner surface of the ventilation duct that got ignited after the flame had released from the loading door of the mixer;

- lack of tightness of technological systems where flammable liquids and combustible liquids are treated, possible creation of dangerous concentrations of these substances in the environment in all modes, since the loading of barium sulfate in the mixer is performed manually through an open door in the mixer cover;

- the use of polypropylene bags for loading barium sulfate into the mixer which have the property of accumulating static electric potential on the surface;

- failure to use for loading of barium sulfate in the mixer a funnel with mesh inserted into the loading door, earthed on the mixer body through insulated electric wire;

- absence of earthed storage bunker for preliminary loading barium sulfate into it from packaging container made of any material located outside gas/air vapor mixture generated by flammable liquids in mixer area;

- fault of the freon gas fire extinguishing system in the building provided by design;

- removal of inert gas (nitrogen) foreseen in the design from the process scheme, which prevents the formation of explosive mixtures;

- no trip button for ventilation plants on the 2nd floor of the building;

- lack in ventilation systems of engineering solutions to prevent the spread of explosive vapors and gases through the air ducts from one room to another in the building;

- lack of effectiveness of production control exercised by management and

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functional units of FSE "KGKPZ" to monitor compliance with industrial safety requirements during the operation of hazardous industrial facilities.

Economic damage caused by the accident at FSE "KGKPZ" amounted to 128.8 thousand rubles.

October 30, 2013, in Block 1, Building 080, Federal State Unitary Enterprise "Morozov Plant", Leningrad region, Morozov village (supervised by North-Western Department), a group fatality occurred. Two people were killed.

In fact, given the circumstances of accidents that have occurred at the facilities of the defense-industrial sector, the main causes of accidents and injuries may be identified as the lack of production control in operation of hazardous industrial facilities and updating of production documentation (design documentation, process regulations and diagrams, manufacturing instructions, etc.) both by the top management of the enterprises, and by persons directly responsible for the implementation of production control.

Production control at the facilities is often exercised formally, without response to obvious prerequisites of emergencies.

In 2013, in the frame of Federal Specific-Purpose Program "Elimination of Chemical Weapon Inventory in the Russian Federation" (hereinafter referred to as the Program) conducted by the Ministry of Industry and Trade and Federal Department for Safe Storage and Elimination of Chemical Weapon, Rostekhnadzor bodies continued to exercise control and supervision activities at chemical weapon storage and elimination facilities.

Monitoring and supervision functions within the frameworks of the Program were performed in accordance with Rostekhnadzor current regulatory and legal basis in the sphere of industrial safety and energy safety and in compliance with the Town-Planning Code of the Russian Federation.

In 2013, Rostekhnadzor provided organizational, methodological and policy guidance of control and supervisory activities in respect of chemical weapon storage and elimination facilities carried out by Rostekhnadzor territorial bodies on the location of the facilities in conjunction with FBE "Federal Department for Safe Storage and Elimination of Chemical Weapons at the Ministry of Industry and Trade of the Russian Federation (Military Unit 70855)."

Elimination of chemical weapon in accordance with the Program was conducted under Rostekhnadzor control on the following facilities: the town of Shchuchye, Kurgan Region (Ural Department of Rostekhnadzor), the town of Pochep, Bryansk Region (Oka Department of Rostekhnadzor), settlement Maradykovskiy, Kirov Region, and settlement Kizner of the Udmurt Republic (Western-Ural Department of Rostekhnadzor), settlement Leonidovka, Penza Region (Lower Volga Department of Rostekhnadzor).

At the chemical weapon elimination facility "Maradykovsky", Rostekhnadzor representatives participated in the activities relating to comprehensive trial run (tests with the use of real media) of the process and equipment for the elimination of complex design ammunition.

In December 2013 at the chemical weapon elimination facility "Kizner" during comprehensive trial run of equipment and systems of the 1st starting complex, Rostekhnadzor within the established powers provided control of safety conditions and compliance with the requirements of the regulatory documents.

In the frame of control measures the following actions were accomplished:

comprehensive trial runs of equipment and systems of the 1st starting complex of Chemical weapon elimination facility 1596 in the settlement of Kizner, Udmurt

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Republic, in accordance with the programs and methods of comprehensive trial run developed and approved by the contractors, representatives of the military unit 55498; as found the operating organization has the necessary licenses for operating explosion and fire hazardous industrial facilities and chemically hazardous industrial facilities;

determined that the actual payroll staff meets the established requirements by 90%, jobs related to residential area maintenance are vacant;

found that persons authorized to work during trial run period meet the relevant qualification requirements and have no medical contraindications to work;

training and qualification of personnel and decision-makers in the field of industrial safety is provided;

production control is organized, Regulations on establishing and implementation of production control of compliance with the industrial safety requirements is developed;

found that the facility has in operation the necessary monitoring equipment and systems for industrial processes monitoring ;

a team for elimination of accident consequences and providing security is formed. Facilities are under round the clock video surveillance and armed security guards;

determined that the regular professional gas and emergency rescue teams are established.

Emergency drills are held with the staff regularly and in accordance with the approved schedule, including those with regular professional gas and emergency rescue teams, in accordance with the plans for localization and liquidation of possible accidents at all supervised facilities controlled by Rostekhnadzor representatives.

In 2013, Rostekhnadzor provided control measures for the final stages of installation and pre-commissioning of process equipment at capital construction sites: Building 1010 "Production Building", Building 1040 "Building for preparing degassing recipes and wastewater treatment", Building 1073 "Wastewater receiving tanks fleet", Building 1076 "Sewage water pumping station", Building 1083 "Gas control point", Building 1120, "Diesel engine power plant", Building 1072 "Reaction mass transfer pump station", Building 1082 "Air and nitrogen compressor station", Buildings 1084, 1088 "Two-section cooling towers", Building 1101 "Stormwater drainage pump station", Building 1102 "Stormwater drainage treatment facilities", Building 1105 "Purified stormwater drainage pumping station", Building 1106 "Polished stormwater drainage tank", Building 1080 "Water cycle chiller plant, pumping station", Building 1046 "Vehicles treatment point", "Heat supply", "Power supply", "External communication and alarms network", "Industrial environmental monitoring system", "Creation of local warning system".

Control and supervision functions at chemical weapon elimination facilities were accomplished by Rostekhnadzor territorial bodies in accordance with the Plan of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia for 2013, and as part of a permanent state supervision at hazardous industrial facilities (Table 8o).

The main violation of industrial safety requirements at chemical weapon elimination facility in the settlement of Kizner, Udmurt Republic, (Facility 1596) was the fact that the installation works were carried out with deviations from design documentation.

Follow-up of elimination of violations identified during control and supervisory activities in 2013 showed that violations were eliminated within the time as

determined by the statement of order.

Contracts for mandatory liability insurance of the owners for injury resulting from accidents at hazardous industrial facilities are provided for all hazardous industrial facilities.

**Table 80**

**Results of Rostekhnadzor control and supervisory activities at chemical weapon elimination facilities in 2013**

<b>Name of the facility</b>	<b>Number of inspections held</b>	<b>Number of administrative fines imposed</b>	<b>Number of violations revealed, incl. violations of</b>		
			<b>Industrial safety requirements</b>	<b>RF Urban Planning Code requirements</b>	<b>RF electric power legislation requirements</b>
Maradykovsky	36, incl. 24 under continuous supervision	1	9	42	3
Kizner	8, incl. 4 under continuous supervision	11	28	83	—
Kambarka	5, incl. 4 under continuous supervision	—	—	—	—
Leonidovka	26	—	—	—	—
Shchuchye	2 (1 scheduled and 1 unscheduled)	—	33	—	—
Pochep-2	5	—	9	8	—
<b>Tota</b>	<b>82</b>	<b>12</b>	<b>79</b>	<b>13</b>	<b>3</b>

In 2013 Rostekhnadzor registered and approved 5 industrial safety declarations of chemical weapon elimination HIFs and industrial safety review reports to them.

15 industrial safety review reports for chemical weapon elimination HIFs were considered and registered.

In 2013, the branches of the military unit 70855 (FBE "FU BHUHO") under Rostekhnadzor control developed and approved 46 plans for localization and liquidation of possible accidents on HIFs specific for chemical weapon elimination facilities "Leonidovka", "Maradykovsky", "Kizner" and "Shchuchye". Similar Accident liquidation plans in the amount of 6 pieces were developed by FSE "Gorny".

Rostekhnadzor in the frame of continuous inspection and participation in the state (acceptance) tests of process systems for chemical weapon elimination facilities considered and coordinated the state (acceptance) testing programs and methods, and process regulations developed in 2013, such as: temporary process regulations for elimination of complex structure products; temporary process regulations for munition disassembly and chemical agents detoxification; temporary process regulations for thermal clearance of munition bodies; temporary process regulations for sanitary and preventive treatment of individual protection equipment; amendments to temporary process regulations.

In accordance with Rostekhnadzor Order No. 186 dated March 31, 2008 "On approval and enactment of general requirements to ensure anti-terrorist protection of hazardous industrial facilities," in 2013 monitoring of emergency protection state of chemical weapon elimination HIFs was carried out.

As found as a result of Rostekhnadzor monitoring of anti-terrorism measures in 2013: chemical weapon elimination and storage facilities are sufficiently protected, their security and defense is provided both by military units, and dedicated security organizations; no infiltration to the facilities is recorded;

anti-terrorism protection measures were carried out in full scope, security and entry control regime systems correspond to the regulatory documents and are in good condition;

facilities are equipped with security hardware, public address and emergency notification systems, the round clock video surveillance is maintained. Notification systems and lists of notified officers are prepared in accordance with the orgchart and payroll;

interaction is established with the Ministry of Internal Affairs of Russia, EMERCOM of Russia, the Federal Security Service of Russia and local governments against the possibility of infiltration or emergency.

Measures that were taken by Rostekhnadzor to control the implementation of safety conditions along with the elimination of violations found by inspections, allowed to substantially minimize the threats of accidents and personnel injuries at chemical weapon elimination facilities, and ensure the implementation of programmed measures for the sake of fulfillment by the Russian Federation of international obligations to eliminate chemical weapon, with stagewise commissioning of startup complexes and at design operation modes of processing capacities. In 2014, a number of tasks which need to be performed on the chemical disarmament facilities should include arrangements for the phased implementation of the newly introduced and modified requirements of the Federal Law No. 116-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities" concerning compliance with the adopted and published in the prescribed manner new federal regulatory documents in the field of industrial safety with the introduction of industrial safety management systems tailored for certain chemical weapon storage and elimination HIFs.

In 2013, work related to declarations of hazardous industrial facilities was continued including such activities as consideration, registration and issue of comments regarding industrial safety declarations of defense-industrial sector enterprises.

In 2013, Rostekhnadzor reviewed and registered 18 industrial safety declarations of defense-industrial sector facilities.

Work was continued in respect of implementation of the Federal Law № 116-FZ dated July 21, 1997 "On industrial safety of hazardous industrial facilities", as well as the Federal Law No. 99-FZ dated May 4, 2011 "On licensing of certain activities" relating to the issuance and renewal of license for certain activities. During the reporting period Rostekhnadzor Headquarters considered licensing material and prepared an opinion on 27 licenses:

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- for operating chemically hazardous industrial facilities - 2;
- for operating explosion and fire hazardous industrial facilities - 4;
- for activities on handling of industrial explosives - 20;
- for industrial safety review activities - 1. There were 3 refusals to provide (re-issue) licenses.

Defense-industrial sector enterprises including hazardous industrial facilities have developed provisions on the production control implementation, and persons were appointed responsible for the organization and implementation of production control.

Production control at defense-industrial sector enterprises is an integral part of production.

In accordance with article 11 of the Federal Law of 21.11.1995 No.170-FZ "On industrial safety of hazardous industrial facilities", most of the entities operating hazardous industrial facilities hazard class I or II established (developed) industrial safety management systems. At other enterprises management systems are under development.

Control over production control organization and development of industrial safety management systems at enterprises is exercised by Rostekhnadzor during scheduled and unscheduled inspections, as well as in the frame of the continuous state supervision.

In 2013, Rostekhnadzor bodies inspected hazardous industrial facilities at 32 entities subordinate to Roscosmos.

Inspection reports were documented and statements of order were issued to eliminate 485 violations of safety requirements.

During 2013, Rostekhnadzor Headquarters together with territorial bodies conducted safety inspections of hazardous industrial facilities operated by defense-industrial sector enterprises: FCE "Kamensky Plant", Kamensk-Shakhtinsky, Rostov Region, FSE "Biysk Oleum Plant", Biysk, Altai Territory, JSC "Salavat Chemical Plant", Salavat, Bashkortostan. In the cause of inspections more than 200 violations and observations in the field of industrial safety were recorded.

Typical violations of industrial safety at these enterprises appears to be such as:

- expired specified lifetime and (or) violations of regulatory requirements characteristic for operation of buildings and structures, technical devices used for production of explosive materials,

- violation of safety requirements in the operation of electrical equipment installed in explosion hazardous areas.

- incomplete availability of enterprises for localization and liquidation of accidents occurred in the operation of hazardous industrial facilities.

In the course of inspections it is found that individual managers and specialists have not been qualified in the field of industrial safety, in some cases it is pointed out to insufficient professionalism of staff servicing the structures and technical devices.

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Based on the results of inspections of the above entities, both legal entities and individuals (officers) were brought to administrative responsibility. The amount of fines was 682 thousand rubles.

Inspected defense-industrial sector enterprises have their production cycle structures and engineering infrastructure overloaded with elements which have lost production necessity, their fixed assets have significant depreciation, however the planned modernization and reconstruction of the production facilities, re-equipment of enterprises remain without adequate funding.

In fact, most industrial safety violations at the inspected enterprises are systemic in nature, which may adversely affect not only the facilities themselves, but also critical facilities in the settlements and industrial zones in the event of emergency.

The inspected enterprises, in conformity with the schedules and with the attendance of Rostekhnadzor representatives, conduct training sessions and emergency drills following emergency scenarios.

Issues regarding antiterrorist security of hazardous industrial facilities were considered during all the inspections.

The inspections proved that defense-industrial sector enterprises have antiterrorist security passports approved in the prescribed manner, organizational and administrative documents on the organization of protection against possible terrorist attacks. At the enterprises officials are appointed responsible for implementation of measures to protect against terrorist attacks.

Regulations and instructions regulating security, entrance control and internal regimes.

The enterprises are guarded by non-departmental security service under the Ministry of Interior Affairs of the Russian Federation or by departmental security service.

Against the possibility of terrorist attacks, the enterprises have established communication and interaction with the Federal Security Service of Russia, the Ministry of Internal Affairs of Russia, EMERCOM of Russia, fire teams, medical institutions, the administrations of nearby settlements.

The results of inspections of enterprises demonstrate that conditions of access and security regime are largely complied with, transport control and examination is maintained, barrier protection is not violated, there are no fixed cases of direct terrorist attack.

During 2013, Rostekhnadzor continued to work to follow-up the elimination of violations of safety requirements in accordance with the statements of order previously issued for defense-industrial sector enterprises.

With the purpose of liquidation and localization of probable accidents, contracts are signed with professional emergency rescue teams. Large enterprises have their internal qualified, equipped and fitted emergency rescue teams.

The enterprises have created fund reserves, and have material and technical resources for elimination of emergency situations of natural and man-caused disasters.

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Material and technical resources include: clothing and equipment, essential goods, building materials, medical equipment, petroleum products (fuel, oil and lubricants), individual protection means, pipes and shut-off valves.

Within the framework of cooperation between the federal executive bodies, in 2013 Rostekhnadzor participated in the work of the interdepartmental work groups, meetings at different levels, conferences, joint inspections.

In accordance with the decision of the Interdepartmental work group established at the Request of the Government of the Russian Federation No. RD-P7-2054 dated April 13, 2012, during July-September 2013 Rostekhnadzor representatives participated in joint inspections attended by EMERCOM of Russia and the Ministry of Industrial Trade of Russia, namely unscheduled inspections of defense-industrial sector enterprises involved in production, storage and disposal of explosive substances and articles containing them, subordinate to the Ministry of Industrial trade of Russia.

During October - November 2013, in accordance with the decision of the meeting of the Interdepartmental work group devoted to coordinate activities of law enforcement and regulatory authorities in order to comply with federal legislation in the aerospace industry and ensure the legality of the use of financial resources in the aerospace industry, formed under the Prosecutor General of the Russian Federation, Rostekhnadzor participated in inspections of the enforcement of industrial safety, procurement, property and budget legislation at enterprises engaged in space activities. In general, the state of industrial safety at enterprises of the defense-industrial sector in 2013 may be assessed as satisfactory.

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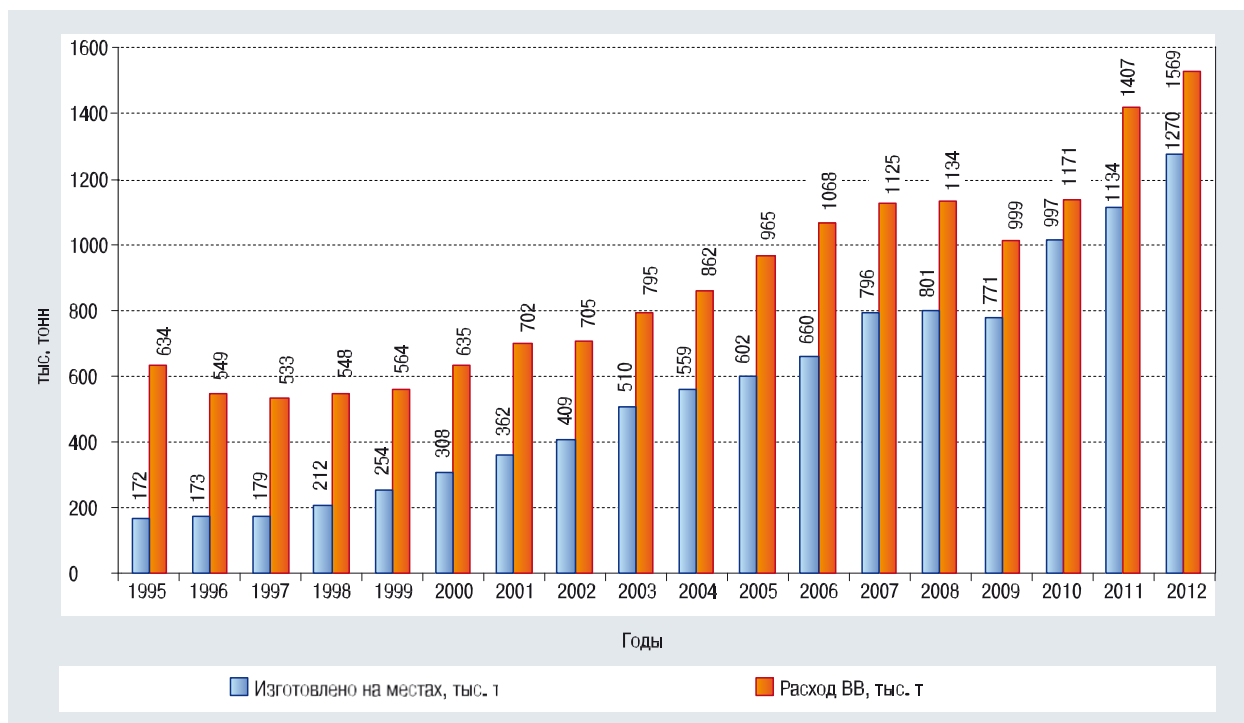
### 2.2.15. Production, Storage and Use of Industrial-Purpose Explosives

In the year of 2013 1,248 supervised organizations worked in the area of industrial-purpose explosives, 4,389 hazardous industrial facilities related to explosives were operated, including 988 storages for explosives and other arranged storage facilities, 2111 cars and other vehicles were applied for explosives transportation, 58 stationary points of mining and other facilities engaged into production of caldo, emulsive matrix and other components for emulsion explosive (EE), 775 portable installations, mix-pump tracks and transport-pump tracks for production of granulated non-TNT and TNT explosives.

In the year of 2013 the amount of explosives expended by organizations which conduct explosive activities was 3% higher than in 2012 and equals to 1,613 thousand tones (it was 1,568.5 thousand tones in 2012). 1,250 thousand tons of explosives (77% of the total amount) were produced close to the places for their application.

In the year of 2013 the number of revealed losses of explosive materials decreased, as compared to 2012, and amounted to 8 cases (10 cases in 2012), including 5 scatterings, 1 loss, and 2 thefts (4 thefts in 2012).

The total amount of stolen explosives is 4.32 kg of explosives and 4 electrical detonators (11.54 kg of explosives and 3 electrical detonators were stolen in 2012); 18 kg of explosives and 8 electrical detonators were scattered, 600 kg of explosives and 30 plain detonators were lost.



**Fig. 15.** The dynamics of production and consumption of explosives in the Russian Federation

Losses of explosive materials at facilities supervised by Lena Department of Rostekhnadzor (2 cases); by Trans-Baikal Department of Rostekhnadzor (2 cases); by North-Ural, West-Ural, Siberian and Yenisei Departments of Rostekhnadzor (1 case in each).

The major causes of the explosives losses are as follows: lack of appropriate control by officials; deviations and violations of design and engineering

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documentation when hole loading and explosive works conducting; issue of unlabeled electrical detonators to explosive engineers; violation of the procedure of examining to identify misfires.

Thus, in JSC Khantyanskiygeophysika (supervised by North-Urals Department) devices preventing from unauthorized removal of seismic fires from pile screwing installation holes UZS-40 were not installed while hole loading in violation of the projects of drilling and blasting activities. This led to theft of 8 seismic charges ZS-40 of 2.56 kg of total weight from the discharged holes.

While conducting explosive works by LLC Staratelskaya Artel Kvartz (supervised by Trans-Baikal Department), an explosive engineer reduced the number of charges in the bottom in violation of the passport of the drilling and blasting activities. It led to the loss (scattering) of 3 kg of ammonite 6ZhV with the means for non-electric detonation system SINV initiating.

In JSC SUEK-Kuzbass "Razrez Zarechniy" (supervised by Siberian Department) 9 kg of emulsion explosive substance DEM were lost (scattered) as a result of violation of design documentation requirements regarding the number of charged holes and structure of the blast for explosive works.

Therefore, and as a result of giving unlabeled electrical detonators to explosive engineers 4 kg of ammonite 6ZhV and 4 electrical detonators ED-1-3-T were stolen from JSC Sarylah-Surma (supervised by Lena Department of Rostekhnadzor).

LLC Dongeophysika also gave unlabeled electrical detonators, individual production numbers of products with explosives given to explosive engineers were not registered in the Register of distribution and return of explosives (form No. 2), and examination of failed blasts was not performed upon completion of explosive works. These violations led to scattering of explosive materials (8 electrical detonators and 5 TNT blocks GTP-85G-K of 0.46 kg of total weight) which were later found by strangers.

Due to unidentified failure of a blast hole charge during explosive works by Tugnuy branch of LLC AZOTTEH in the premises of JSC Razrez Tugnuyskiy at a coal storage in the village of Muhorshibir (the Republic of Buriatia) two blocks of TG-P850 were found. They had NCI Rionel detonators installed.

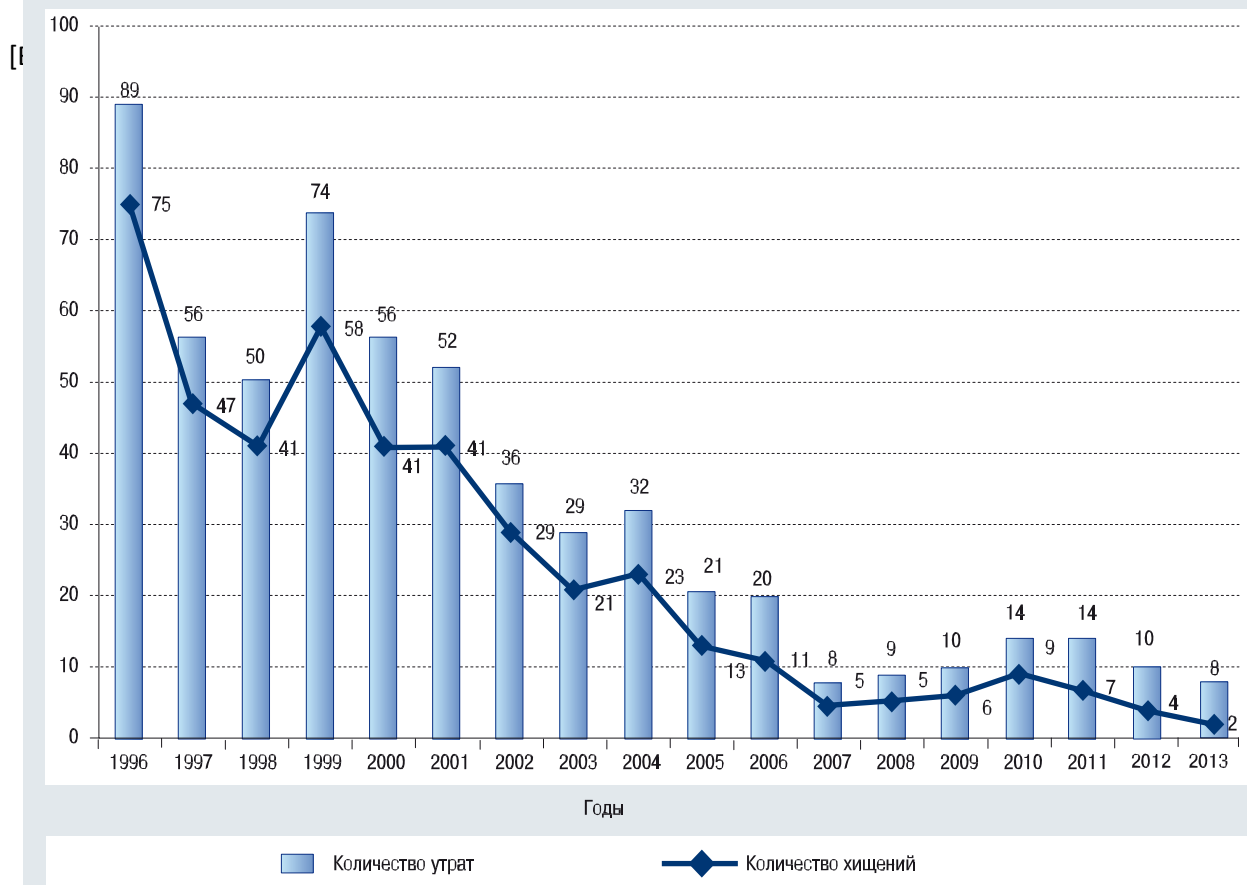
Poor labeling of detonator blocks T-400G and serious violation of explosive accounting by the manufacturer (JSC Polymer), supplier (JSC Promsintez) and user (JSC BazelCement-Pikaliovo) led to shortage of said blocks.

Appropriate administrative measures were taken upon the results of investigations of EM losses and revealed cases of violation of the industrial safety requirements.

Figure 16 shows the number of annual losses (and thefts).

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**Fig. 16.** The dynamics of number of losses and thefts of industrial-purpose explosive materials

***Accident and injury rate***

In the year of 2013 due to casualties at facilities related to industrial-purpose explosive materials use 6 people died (1 died in 2012). Two accidents took place (one in 2012).

Following accidents and injuries took place at the facilities supervised by North-Western Department: 1 group and 1 fatal accident, 3 victims in the absence of trauma in 2012; at the facilities supervised by North-Urals Department: 1 group and 1 fatal accident, 2 accidents (1 of them in the absence of fatal injuries in 2012) (tables 81, 82).

**Table 81*****Distribution of Accidents and Injury Cases among Rostekhnadzor Territorial Bodies***

No.	Name of the territorial body of Rostekhnadzor	No. of group accidents		No. of victims in fatal non-group accidents, persons		Total amount of victims in group fatal accidents, persons		Number of accidents	
		2012	2013	2012	2013	2012	2013	2012	2013
1	North-Western Department	0	1	0	3	0	3	0	0
2	Pechora Department	0	0	0	1	0	1	0	0
3	North-Ural Department	0	1	0	1	0	4	1	2
4	Lena Department	0	0	1	0	1	0	0	0
5	Far-Eastern Department	0	0	0	1	0	1	0	0
	<b>Total:</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>9</b>	<b>1</b>	<b>2</b>

**Table 82*****Distribution of Accidents and Injury Cases among the constituent entities of the Russian Federation***

No.	Name of the territorial body of Rostekhnadzor	No. of group accidents		No. of victims of fatal accidents, persons		Total amount of victims in group fatal accidents, persons		Number of accidents	
		2012	2013	2013	2013	2012	2013	2012	2013
1	Arkhangelsk Region	0	1	0	2	0	2	0	0
2	Leningrad Region	0	0	0	1	0	1	0	0
2	Nenets Autonomous Area	0	0	0	1	0	1	0	0
3	Yamalo-Nenets	0	0	0	0	0	0	1	1
4	Tyumen Region	0	1	0	1	0	4	0	1
5	the Republic of Sakha	0	0	1	0	1	0	0	0
6	Khabarovsk Territory	0	0		1	0	1	0	0
	<b>Total:</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>9</b>	<b>1</b>	<b>2</b>

The accidents and casualties occurred due to both man-induced and organizational causes related to severe violations of requirements of the Unified Safety Rules for Blasting Operations by the explosive workers.

On March 27, 2013, when LLC Uganskneftegasgeophysika performed blasting-perforation during assembly of electrical blasting circuit at the collar of a well, unauthorized actuation of electrical detonator ED-PN occurred, and this led to explosion of a charged drill-press KPO-89. 1 person died because of the explosion, and three were seriously injured. Possible causes of the accident are external impact on the electrical detonator in the form of a radio-emission or static electricity or violation of safety requirements when assembling of the explosive chain.

Other violations found in the investigation contributed to this case. The personnel, which is not related to blasting perforation, did not leave the hazardous zone. Blasting gears and their keys were stored together and this could not prevent from access by strangers. Areas for earthing of special equipment were not identified on the drill site. No act of preparedness of the wells for blasting perforation was developed. On April 17, 2013, when the State Public Institution of the Arkhangelsk region "The Center for Civil Protection Measures" (supervised by North-Western Department of Rostekhnadzor) performed icebreaking and explosive activities in the Kholmogorsk area, close to the village of Orletsy, there was an unauthorized explosion of a blast. As a result, a rescuer of the division and head of the division for special activities died. The most probable cause of the accident is a strike of a static electrical charge in the moment when the electrical detonator ED-8-Zh was connected to the chain.

The organizational causes of the group fatal accident were as follows: poor organization of work, violation of the procedure for management with explosive materials (electrical detonators were not checked by their electric resistance, the explosion chain assembly procedure was violated as well as that of withdrawal of personnel which is not engaged into charging from the hazardous zone); violation of passport of explosion works; violation of the procedures of storage, transport, use and accounting of explosive materials. No arranged storage place for EM, Register of distribution and return of EM (form No. 2).

On July 9, 2013, when JSC Bashneftegeophysika (supervised by North-Ural Department of Rostekhnadzor) performed drilling and blasting, there was an unauthorized actuation of 40 electrical detonators EDS-1 in the factory cardboard package due to the impact of high-frequency emission from the antenna of the radio station. Two employees were severely injured. Radio station for communication and operation of the explosion synchronizing system was at a short distance from the electrical detonators (1 m) which violated the rules. It turned out that the explosion engineer was not qualified for the knowledge of safety requirements to explosive works.

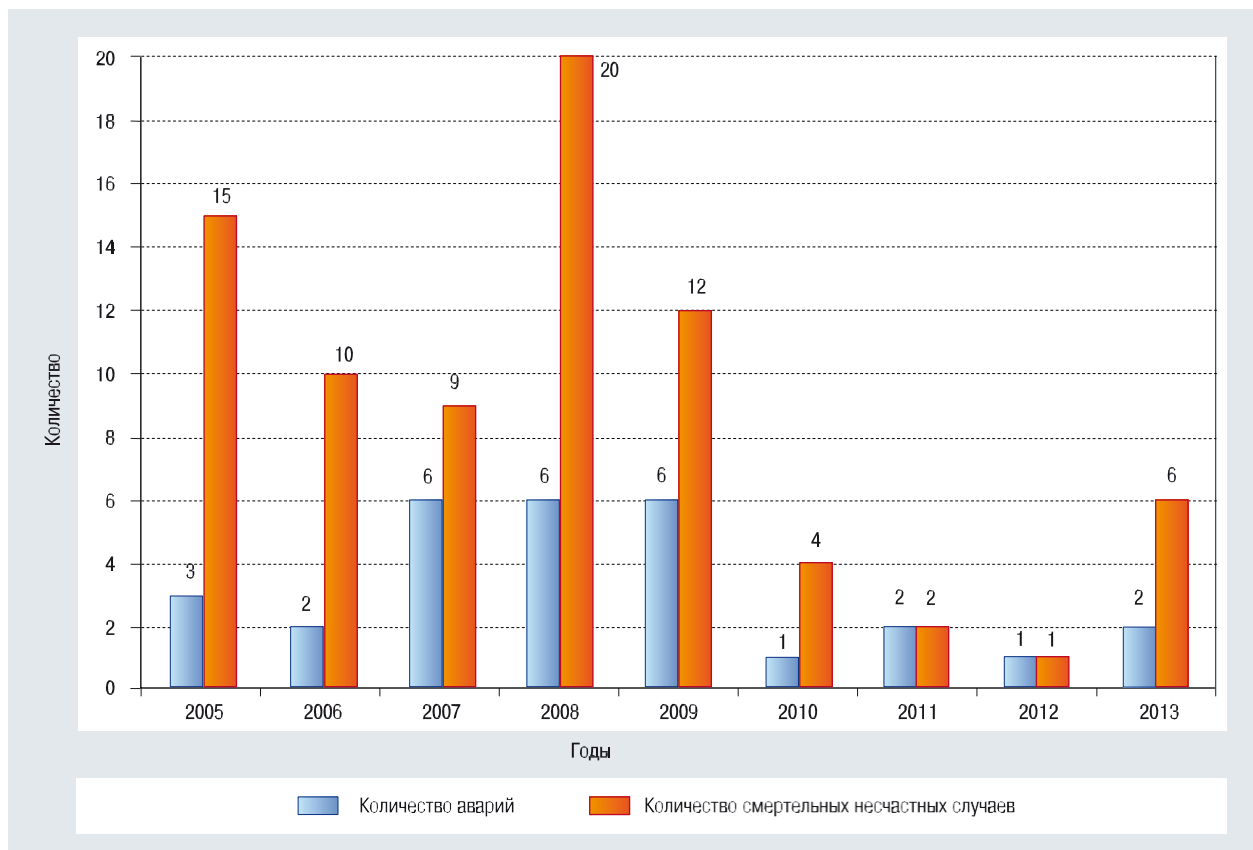
On August 20, 2013, when JSC Gavrilovskoye Karieroupravleniye (supervised by North-Western Department of Rostekhnadzor) performed explosive works in an open-cast, a driver from the company "Cementno-betonnye izdelia" was killed by fly rock travel although he was in a car on a public road. The accident was caused by severe mistakes when calculating the area hazardous for public due to fly rock travel, and deviation from the design solutions.

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On November 16, 2013, an explosion engineer of LLC "Okhotskaya gorno-geologicheskaya kompania" (supervised by Far-East Department of Rostekhnadzor) did not stay at a safe distance and gave an impulse for an explosion as a result of which he was fatally injured. The loss due to accidents at hazardous industrial facilities related to management with industrial-purpose explosive materials was 824 thousand rubles, and direct losses here were 703 thousand rubles and 122 thousand rubles — expenditures on localization and elimination of accident consequences, including those on technical investigation.

The occurred accidents did not cause any environmental damage or third-party damage.

The annual number of accidents and fatal accidents is showed in Figure 17.



**Fig. 17.** The dynamics of number of accidents and fatalities in the Russian Federation

### ***Antiterrorist activity***

In accordance with Federal Law No. 35-FZ dated March 6, 2006, "On Counter-Terrorism Activity", regional departments of Rostekhnadzor conducted counter-terrorism activities through controlling security of industrial-use explosive materials at the supervised facilities, improving antiterrorist protection of facilities related to production, storage and use of industrial explosive materials.

At facilities operating HIF responsible persons were appointed to control arrangement of protection against any possible terrorist attacks; measures were developed to avoid access by unauthorized persons to the territory of hazardous facilities, etc. Antiterrorist awareness is cultivated among personnel of such

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facilities: trainings, briefings, studying of accident elimination plans, etc. Special attention is paid to the issues related to reduction of transportation of industrial explosive materials due to increasing their production out of non-explosive components in mix-pump tracks and at fixed points located in vicinity to explosive works areas. Thus, in the year of 2013 out of total amount of spent explosives (1,613 thousand tones) there were 830.5 thousand tons of emulsion explosives (66% of all the explosives produced closely to the application areas and 52 % of the total consumption amount).

Regional departments of Rostekhnadzor systematically conduct explanatory activities in organizations on the issues of safe management with explosive materials, assurance of their accounting and security, counter-terrorism measures. They have arranged cooperation with legal enforcement bodies, Federal Security Service and Emergency Control Ministry of Russia regarding joint inspections, exchange of information on security of explosive materials, preparedness of organizations for accident elimination at supervised facilities, investigation of causes of accidents and fatalities, losses of explosive materials. The organizations issued appropriate orders, assigned persons responsible for security of HIFs from terrorist attacks. Accident elimination plans were amended with provisions on defense in case the guarded facility is attacked.

No cases of terrorist attacks at supervised facilities registered in 2013.

The analysis of inspections conducted in 2013 by regional departments and the Headquarters of Rostekhnadzor shows that the supervised organizations associated with production, storage, and use of explosive materials on the whole observe the industrial safety regulatory procedures established by the Russian Federation legislation. Corresponding hazardous production facilities are registered in the public register, procedure for HPF declaration, industrial safety review and insurance is observed. The organizations have got special services of production control.

A large amount of concerns appears here. They are related to registration of hazardous industrial facilities where explosive works are held by service organizations contracted by the customer. For instance, regional departments of Rostekhnadzor oblige organizations performing blasting perforation at oil and gas wells owned by oil and gas producing companies, or explosion works at facilities owned by mining companies to register HIFs.

However, registration of an HIF in compliance with the established requirements is performed by an organization operating the HIF by the propriety, rent and other legal rights.

Topical are issues of improving safety assurance of underground explosions, replacement of pneumatic charging with granulated explosives by other types of mechanical loading (emulsive, gel explosives) excluding the potential for generation of explosive dust-air mixture and static electrical charges in the work area, and introduction at coal-pits, which are dangerous by gas or dust, of new safe and efficient coal-mine powders (including unfadable emulsion) and means of mechanical charging which permit to avoid entering of flashes and explosions of methane-air mixture and coal dust.

### ***Analysis of Basic Indicators of Supervisory and Licensing Activities***

Basic indices of supervisory activity in the period of 2008–2013 in the field of

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explosive materials are provided in table 83.

**Table 83**

***Basic indices of supervisory and licensing activities in the period of 2008–2013***

<b>No.</b>	<b>Indicator</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
1	Inspections performed	3,843	2,651	1,654	1,497	2,247
2	Violations revealed	17,631	11,489	7,270	4,668	4,052
3	Administrative penalties imposed, total	888	826	650	592	507
	Materials handed to the law-enforcement bodies	12	9	3	3	2
	Administrative penalties imposed	845	819	562	516	494
4	The sum of penalties imposed (thousand	3,860.6	4,829.5	22,186	29,847	23,765

In the year of 2013 inspectors of Rostekhnadzor conducted 2,247 inspections of supervised organizations. 1,775 out of them were unscheduled (including inspections in the mode of continuous supervision) and 478 were scheduled inspections. The number of violations was 13% less and equals to 4,052 (there were 4,668 in 2012). The number of inspectors is 121 (110 of them combine this type of supervision with others). 4,052 violations were found in the course of inspections. The inspection results were 561 statements of order, and suits on 348 administrative offenses were filed. Administrative suspension of the activity was applied 12 times, and temporary ban was applied 9 times. The total sum of penalties made up 23.76 million rubles, including 153 thousand rubles to — individuals; 10.62 million rubles — to officials and — 13 million rubles — to legal entities.

In the year of 2013 2,972 permits were issued for the right to work with industrial-purpose explosive materials, 51 permits were withdrawn, 3,583 explosion engineer qualification certificates were issued, 21 certificates were withdrawn.

***Permitting Activity of Rostekhnadzor in the Field of Management with Explosive Materials Licensing activity***

In the year of 2013 the Headquarters of Rostekhnadzor renewed 169 licenses for the right to work with industrial-purpose explosive materials, 51 licenses were issued. 20 organizations got denial.

Rostekhnadzor territorial bodies issued 31 licenses for handling industrial-purpose explosive materials (for use and storage of industrial-purpose explosive materials). 76 licenses were renewed.

Based upon the analysis of denials to issue/renew a license for activities related to handling industrial-purpose explosive materials, the most common causes are as follows:

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- when the license applicant (licensee) does not have qualified personnel with higher or secondary specialized (technical) education and work experience in appropriate position of at least 3 years and qualified as per compliance with the established professional requirements;

- when the license applicant (licensee) does not have the propriety right or any other legal ground for the premises for conducting the applied activities.

In 2013, no cases of temporary suspensions or annulments of licenses were registered.

In 2013, 163 document packages regarding execution of Rostekhnadzor permits for application of novel explosive materials and technical devices were reviewed. Following the reviews, 109 permits to use technical devices were issued, on six occasions organizations were denied permits. 46 permits for application of explosive materials were issued, two permits were denied.

***Development of regulatory documents. Cooperation with other executive authorities***

In the year of 2013 there were developed Federal codes and regulations in the field of industrial safety, "Safety Rules for Explosive Works." These Rules were approved by Decree No. 605 of Rostekhnadzor on December 16, 2013.

Rostekhnadzor cooperates with the Federal Service for Export and Technological Control (FSETC of Russia) in the field of supervision over turnover of industrial-purpose explosive materials.

Cooperation is based upon Interdepartmental Comprehensive Plan (FSETC of Russia, Ministry of Internal Affairs, and Rostekhnadzor) on joint measures aimed at prevention of illegal trafficking of imported industrial-purpose explosives in the Russian Federation. It is also based on the Administrative Regulations of Cooperation between the Federal Environmental, Industrial and Nuclear Supervision Service of Russia and the Federal Service for Export and Technological Control (approved by joint order of Rostekhnadzor and FSETC of Russia No. 299/57, dated May 16 2012, registered by the Ministry of Justice on July 25 2012, registration No. 25011).

The Agreement on Information Exchange between the Federal Service of Export and Technological Control, Ministry of Internal Affairs and the Federal Environmental, Industrial and Nuclear Supervision Service of Russia is in force and it is aimed at control over target use of industrial-purpose explosives which are imported into Russia.

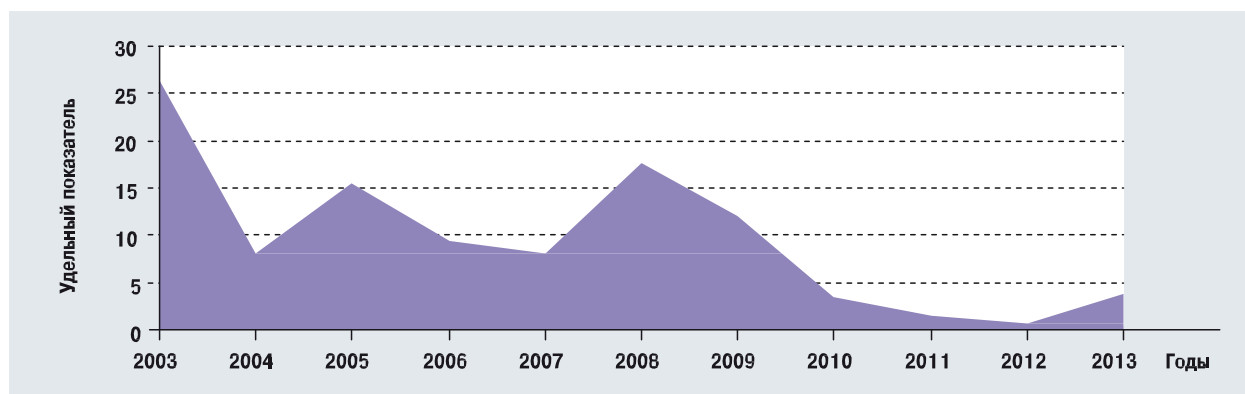
Rostekhnadzor cooperates with the Ministry of Defense of the Russian Federation to implement item 9 of Decree No. 537 of the Government of the Russian Federation, dated August 25 2005, "On Functions of the Federal Executive Authorities and the Russian Academy of Sciences on Implementation of the Agreement on Comprehensive Nuclear Tests." In compliance with the reached agreement, Rostekhnadzor quarterly sends to the Ministry of Defense information about completed and scheduled huge blasts in Russia.

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### *General assessment of industrial safety*

Specific rate of fatally injured per 1 million tone of applied explosives is provided in Figure 18. And it shows that the index decreases.



*Fig. 18.* Safety assurance with using explosives

In 2003 the specific rate was 27 persons/ million tons of applied explosives; currently the index is 3.84 persons/ million tons.

#### *2.2.16. Transportation of Hazardous Substances*

According to the data of the regional departments of Rostekhnadzor, the total amount of supervised organizations acting in the field of industrial safety in the part related to transportation of hazardous substances was 4,560 in 2013 (it was 6,096 in 2012); whereof 4,342 organizations (5,911 in 2012) work in the field of operation of hazardous industrial facilities related to transportation of hazardous substances; 24 organizations (30 in 2012) act in the field of designing HIFs; 18 organizations (17 in 2012) work in production of technical devices applied at HIFs, 102 organizations (98 in 2012) work on review of industrial safety assurance.

There are 4,914 hazardous industrial facilities registered in the State Register (7,244 in 2012).

The inspectorate staff of 102 employees performs supervisory activities. 73 employees of them are engaged into 2 and more areas of supervision.

General amount of hazardous substances transported at HIFs is represented by flammable liquids (hazard class 3 as per GOST 19433–88 "Hazardous goods. Classification and Labeling"). Hazardous goods of class 2 (ammonia, chlorine, liquefied hydrogen gas), 4 (balsam wool, seed cotton, sulphur), 6 (coke-chemical raw materials) and 8 (acids and alkali) are transported in less amount.

Transportation means for hazardous substances in the amount of 85,727 items are basically road tankers of oil and gas and chemical production facilities, motor vehicles in the amount of 14,763 items are used for transportation of oil products and liquefied hydrogen gases.

The length of non-public railways (roads) referred to as hazardous industrial facilities is 34,708 km, out of which 23,720 km are railways.

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In 2013 one accident was registered at an HIF related to transportation of hazardous substances (4 occurred in 2012). That accident took place on January 15, 2013, in the State Autonomous Institution "Aviabaza" of the Amur Region (supervised by Far-Eastern Department).

When oil products were poured into a tanker at the storage of GSM of Aviation department of Svobodniya (branch of the SAI Aviabaza), there was a popping sound and steam and air mixture exploded in the tanker which burnt up later, and the driver got slight injuries. Material damage caused by the accident amounted to 96 thousand rubles.

The accident was technically caused by static electricity with high voltage difference due to physical properties of the fuel. It led to spark formation and explosion of the steam and air mixture. It indicates that the requirements were not met during pouring activities at the pier.

The investigation found that during operation of the HIF there was a violation of requirements of Federal Law No. 116-FZ of July 21 1997, "On industrial safety of hazardous industrial facilities", of regulatory documents in the field of industrial safety; there were no measures for preventing generation of explosive and flammable medium during pouring operations; process operations were not automated; there was no medium control and blocking of control tools which allow to stop generation of an explosive medium at the initial stage.

Organizational measures related to development of production control provisions, plan of localization and elimination of emergency situations, certification of management and specialists in the field of industrial safety were not performed. People who do not meet appropriate qualification requirements get permit to work at an HIF.

To eliminate revealed drawbacks which have led to the accident, SAI Aviabaza of the Amur Region developed a plan of measures implementation of which is controlled by the Far-Eastern Department of Rostekhnadzor.

No registered cases with fatal injuries in 2013 (4 fatal injuries in 2012).

Below there are accident and fatal accident rates of 2013 in comparison with 2012 (table 84–87).

**Table 84**

***Accidents by their types in 2012 and 2013***

<i>Cause of the accident</i>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Explosion	2	—	-2
Fire	2	1	-1
<b>Total:</b>	<b>4</b>	<b>1</b>	<b>-3</b>

**Table 85**

***Distribution of fatal injuries by injury factors in 2012/2013***

<i>Causes</i>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Thermal injury	2	0	-2
Chemical burn	0	0	0

<i>Causes</i>	<b>2012</b>	<b>2013</b>	<b>+/-</b>
Intoxication	0	0	0
Destruction of technical equipment	1	0	-1
Violation of maintenance regulation for a technical device	1	0	-1
<b>Total:</b>	<b>4</b>	<b>0</b>	<b>-4</b>

**Table 86**

***Distribution of Accidents by constituent entities of the Russian Federation and Regional Departments of Rostekhnadzor in 2012/2013.***

<i>Federal constituent entities of the Russian Federation</i>	<b>2012</b>	<b>2013</b>
<b><i>Far Eastern Federal District</i></b>		
Amur Region	1	1
<b><i>Siberian Federal District</i></b>		
Tyumen Region, town of Nyagan	1	0
Republic of Buriatia	1	0
<b><i>Southern Federal District</i></b>		
Krasnodar Territory	1	0
<b>Total in Russia:</b>	<b>4</b>	<b>1</b>
<b>(+) increase/(-) decrease:</b>		<b>-3</b>

**Table 87**

***Data on fatal accidents in the constituent entities of the Russian Federation in 2012 and 2013***

<i>Constituent entities of the Russian Federation</i>	<b>2012</b>	<b>2013</b>
<b><i>North-Western Federal District</i></b>		
Leningrad Region	1	0
<b><i>Far Eastern Federal District</i></b>		
Amur Region	2	0
<b><i>Siberian Federal District</i></b>		
Irkutsk Region		
Republic of Buriatia	1	0
<b>Total in Russia:</b>		
<b>(+) increase/(-) decrease:</b>		<b>-4</b>

68 incidents registered in the reported period (34 in 2012). 23 of them occurred on discharge racks of LLC Lukoil Nizhegorodnefteorgsyntez (supervised by Volga-Oka Department) due to leak of oil products from railcars owned by industrial facilities and transport companies; 38 incidents were registered at facilities of LLC Magistral Service, LLC PKF, LLC SKV, LLC SPK, etc. (supervised by the Central Department).

The main causes of the accidents are releases (leak) of hazardous substances from railcars during pouring operations due to defects of pouring devices and kettles of the railcars. One accident at the railway siding to JSC Sredneural'skiy Medeplavilnyj Zavod (town of Revda of the Sverdlov Region) was registered in the Ural Department. The accident was caused by spontaneous leave of 14 railcars loaded with sulphuric acid which went off the track in the area of unguarded service road passing the railways; and 12 railcars turned over, it lead to serious damage of 4 kettles and leakage of 104 tons of sulphuric acid, damage of the elements of upper structure of the railway of 80 m distance and to destruction of the track panel.



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That spontaneous leave was caused by absence of stop blocks. A criminal case was opened regarding that theft. The railcars went off the track because of poor state of the railways due to accumulation of mud and building sand and due to generation of ice mound in the trays of the service road crossing the railways. The economic damage caused by the accident was 26 million rubles.

One accident registered in LLC Mendelevskazot (supervised by Volga Department) was caused by spontaneous leave of 5 open box cars, 4 of which were loaded with ammonia nitrate in big bags. When open box cars collided with a diesel-locomotive shunter, a wall of an open box car was damaged and approximately 3 tons of ammonia nitrate spilled out of the bags on the railway.

Basing on the investigation results, measures were developed aiming at prevention of such cases in the future; people who were found guilty in that case were subject to disciplinary action, and the chief engineer of LLC Mendelevskazot was held administratively liable.

The following documents were adopted as implementation of the provisions of the Federal Law No. 22-FZ dated March 4, 2013 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", specific legislative acts of the Russian Federation and on invalidation of sub-item 114 of item 1, article 33333, Part 2 of the Tax Code of the Russian Federation", hence, the inspectorate staff of regional departments of Rostekhnadzor reviewed on a rolling basis applications of organizations on re-registration of hazardous industrial facilities with assigning hazard classes according to the established procedure. As a result of re-registration, 2,310 facilities were withdrawn of the state register; 1,718 facilities were registered within other technologically connected HIFs. At the same time, the areas of transportation of hazardous substances are assigned as hazard classes 3 and 4.

However, re-registration of HIFs was not performed at appropriate level in all the regional departments.

Thus, upon the results of re-registration and comparing with the initial registration in the Register of HIFs as "areas for transportation of hazardous substances" registered in the North-Western Department, there are 604 facilities in comparison with 646 (7% reduction), in the Caucasus Department there are 198 facilities in comparison with 222 ones (11% reduction), in the Central Department the number of facilities has not practically changed.

At the same time, the number of organizations operating specifically registered "areas for transportation of hazardous substances" significantly reduced: from 424 to 251 in North-Ural Department (45% reduction), from 396 to 136 in Yenisei Department (66% reduction), from 419 to 294 in Siberian Department (42% reduction), from 137 to 43 in Middle Volga Department (68% reduction). Production control at supervised enterprises is a part of the industrial safety management system. It is performed by the operating organizations through a set of measures aimed at safe operation of hazardous industrial facilities. The major part of facilities developed appropriate provisions on production control; their orders assign people responsible for arrangement and production control.

566 major industrial facilities have production control services which control compliance with the requirements of industrial safety during transportation of hazardous substances. At other facilities production control is generally assigned by the management to officials who are normally technical heads of such organizations.

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Facilities developed their annual and monthly plans of measures taken by the employees responsible for production control and work of production control services. Such plans are implemented in timely manner. Over the reporting period the production control services and people responsible for production control performed 7,118 monitoring and preventive inspections with 6,696 scheduled ones; they also took 6,535 measures to ensure implementation of requirements of industrial safety.

The analysis of industrial safety and results of Rostekhnadzor inspections demonstrate that efficiency of production control in the organizations is different, from quite efficient at JSC Promyshlennyj transport, JSC V-Sibpromtrans, JSC Belozerskoye DRSP, JSC Progress, JSC NLMK, LLC Gazkomplekt-K, JSC Dalur, JSC Rusal-Sayanogorsk, JSC Rusal Sayanal to a low one at JSC KAPO aft. S.P. Gorbunov, JSC Tatagrohimpervise, JSC Olshanskiy Karier, JSC OP-TAN-Kurgan, JSC Mehonskoye HPP, Ordzhonikidzevskoye DRSU, co-operative association of prospectors Khakasia, LLC Keramzit, GBU RME Aeroport Yoshkar-Ola where production control is formally arranged, the level of inspections is low and safety factors are not systematically analyzed.

The major deficiencies of arrangement and implementation of production control are absence of clear organizational structure for management of transportation of hazardous substances at the facilities, of specific distribution of responsibilities among the structural divisions, management and specialists for organization, conduct and control of transportation of hazardous substances at the facilities, including operation of technical devices, equipment applied during transportation of hazardous substances, including those applied for loading and pouring.

When conducting supervisory measures, technical state of non-public railways is visually examined. The majority of enterprises of railway transportation develop a system of technical maintenance of non-public railways. It envisages assessment of their actual state and planning of preventive works aimed at ensuring their stable, reliable and predictable condition during the entire operation period. The major part of organizations timely control state of railways with the help of monitoring equipment.

In the reporting period areas of supervised enterprises, where hazardous substances are transported, were examined. It turned out that the state of technical means for transportation and non-public access ways is generally satisfactory.

The main problem related to industrial safety assurance of hazardous substances transportation is lack of finance for technical upgrade programs, upgrade of production facilities in operation and absence of regulatory documents within the system of Rostekhnadzor.

At the same time over the reporting period a number of facilities got increased finance for safety improvement of transportation of hazardous substances; TR-1, TR-2 and TR-3 (types of repair) mid-life and capital repairs of locomotives were arranged; replacement of obsolete rails into rails of R-65 type is ongoing on the route of the trains with hazardous loads as well as replacement of railroad switches; rails and switches undergo diagnostics with the help of defectoscopy means; stop blocks of non-sparking materials are purchased; placards are installed by the railways and roads; places of hazardous goods unloading are covered with solid waterproof paving. When the organizations were inspected, the issues of availability of

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instruction, process regulations and other documents regulating activities related to transportation of hazardous substances, their reloading, unloading, layover of vehicles and their preparation for transportation were considered.

Revealed violations in a number of organizations led to development of process and operation documentation, actual documents were updated in compliance with the industrial safety codes and regulations.

In JSC VPZhT (supervised by Upper Don Department) mid-repair was performed at 350 m of the railway for carriages with hazardous goods; 2 sets of metal parts were replaced as well as 4 sets of cross bars of track switch; 125 m rails were replaced; rail crossing was repaired; routine repairs of locomotives were performed.

At facilities of JSC NSMMZ (Hardware and Metal Plant of Nuzhneserginsk) railways were completely reconstructed; JSC Kurganmashzavod, JSC Sibgazservice, JSC Generating Company of Kurgansk developed schedules for repair of non-public railways (supervised by Ural Department).

Facilities of JSC Kazanorgsyntez, FKP Kazan State Public Gunpowder Factory and others have their access railroads repaired; FKP Kazan State Public Gunpowder Factory replaced aluminum protection of cars and made wooden coating fire resistant for cars transporting explosives; LLC Kargill constructed a locomotive engine house with equipment for repair and servicing shunting engines (supervised by Upper Don Department).

At the same time, when the Volga Area Department inspected JSC Kazan Plant of Synthetic Rubber, it was noted that repair of a rolling stock used for hazardous substances transportation is not performed temporarily. The chief engineer of the plant was held administratively liable for such violation.

In the reporting year, there was continued the activity on practical implementation of Federal Law No. 116-FZ of July 21, 1997, "On Industrial Safety of Hazardous Industrial Facilities", Federal Law No. 99-FZ of May 4, 2011, "On Licensing of Specific Activities" regarding licensing operation of HIFs.

Compliance with the license conditions was inspected within the scope of scheduled inspections at enterprises and within pre-licensing inspections.

In the reporting period regional departments of Rostekhnadzor issued 110 licenses for operation of explosion and fire hazardous industrial facilities (140 in 2012), regarding transportation of hazardous substances. They re-issued 170 licenses (137 in 2012), refused to issue 27 licenses (45 in 2012), had 30 administrative penalties imposed (20 in 2012) for non-observance of license conditions, and the total amount of penalties was 1,172.9 (637.9) thousand rubles.

Upon the results of inspections at JSC Kirovskaya TEC-1, LLC Poleko, JSC of Playwood Mill of Viatka, JSC Territorial Generating Company No. 5, the North-Ural Department commenced administrative cases after article 9.1 against 16 officials and 2 legal entities (JSC OAO Municipal Systems of Kirov, LLC GaloPolymer of Kirov-Tshepetsk), administrative penalties were imposed on the total sum of 700 thousand rubles.

**Table 88**

***Industrial safety review conclusions in 2012 and 2013***

<i>Years</i>	<i>Desig</i>	<i>Buil</i>	<i>Tec</i>	<i>Safe</i>	<i>Oth</i>	<i>Approved</i>	<i>Denied</i>
2012	13	124	282	0	91	439	61
2013	62	312	411	5	73	762	75

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Supervision over fulfillment of Federal law No. 225-FZ dated July 27, 2010, "On compulsory civil liability insurance of owners of hazardous facilities for any harm inflicted as a result of an accident" is performed during scheduled field inspections. Enterprises working at HIFs have contracts on civil liability insurance of the owner of the facility for any harm inflicted as a result of an accident at such a facility.

In the reporting period control and supervisory work by regional departments of Rostekhnadzor was aimed at preventing, detection and suppression of violations of the actual federal legislation, regulatory legal and regulatory technical acts in the field of industrial safety, compliance with the obligatory requirements of Federal Law No. 116-FZ of July 21, 1997, "On Industrial Safety of Hazardous Industrial Facilities", other federal laws and other regulatory legal and regulatory technical acts of the Russian Federation in the field of industrial safety, and at increase of level of industrial safety in the subordinated organizations which transport hazardous substances by railway and motor vehicles.

When inspecting supervised facilities, the regional departments found some typical violations of industrial safety requirements:

insufficient level of control by the managers of the organization over compliance of with the industrial safety requirements when training and qualifying their employees, while performing production control, and preparing to localization and elimination of accidents;

- insufficient financing of measures on bringing the technical arrangement and structures of areas of hazardous substances transportation up to the regulatory requirements;
- unsatisfactory state of non-public roads and railways.

In the year of 2013 the regional departments held 9 inspections together with representatives of other bodies of state and municipal control.

The inspectors of the Lower Volga Department held 6 inspections together with the Transport Prosecutor's Office of Volgograd. Those inspections were dedicated to compliance of LLC Volgogradskiy TD Nefteproduct, JSC Profit and JSC Pervaya Gruzovaya Kompaniya with the requirements of industrial safety of hazardous industrial facilities, including safety rules for transportation of hazardous goods via railway.

Upon a request of the Transport Prosecutor's Office of Kirov, an unscheduled inspection was held at the Provision Division of the Kirov Department of the of Provision Department of Nizhny Novgorod Directorate of the structural unit of Roszheldorsnab, branch of JSC RZhD.

The inspector staff of the North-Western Department inspected the branch JSC Shell and Aerofuels upon a request of the Transport Prosecutor's Office of Saint Petersburg. Upon a note of the General Department of Economic Security and Anti-Corruption of the Ministry of Internal Affairs of Russia, the said department arranged an inspection at JSC Aurora (Leningrad Region).

It is noted that the number of inspections in 2013 reduced from 2,957 in 2012 down to 2,370. It is related to re-registration of hazardous facilities, cancellation of scheduled inspections due to loss of hazard level by the facilities. 6,718 violations of industrial safety requirements were found during inspections (9,933 in 2012).

In the reporting period regional departments of Rostekhnadzor worked on

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implementation of rights granted by the Administrative Code of the Russian Federation No. 195-FZ of January 30, 2001, and Federal Law No. 45-FZ of May 9, 2005, "On Introduction of Changes into the Administrative Code of the Russian Federation and Other Legislative Acts of the Russian Federation, and on Invalidating Specific Provisions of the Legislation."

The work was conducted under the scope of Order No. 21 of Rostekhnadzor of January 21, 2005, and Order No. 278 of November 29, 2004, "On Approval of the List of Officials of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia, Authorized to Make Protocols on Administrative Offenses", and instructioning and methodological materials.

Over 12 months of 2013 693 administrative penalties were issued upon the results of inspections (894 in 2012). 484 of them (641 in 2012) were against officials, 127 (150 in 2012) were against legal entities. The total sum of imposed penalties was 22,273 thousand rubles (26,526 in 2012), 16,572 thousand rubles of them exacted (22,208 in 2012).

Administrative penalties were applied in 2013 in the following cases:

- by Siberian Department to such legal entities as FKP Anovit, LLC Sibirsktorg, JSC Switch Plant of Novosibirsk, LLC NB Sokurskaya, the total amount of penalties was 800 thousand rubles;
- by Interregional Technical Department to FSUE GKN-PTc after M. Khrunichev, FSUE NPTs of gas and pipe construction Salut, the total amount of penalties was 850 thousand rubles;
- by Ural Department to legal entity LLC PZhT-55, the penalty was 250 thousand rubles, to legal entity JSC SUMZ it was 500 thousand rubles.

It is noted that some regional departments rarely apply penalties, for instance, the North-Ural Department held 67 inspections and found 43 violations, but it imposed only 5 administrative penalties; the Trans-Baikal Department conducted 58 inspections, finding 57 violations, but it did not impose any administrative penalties.

However, the Central Department applied 94 administrative penalties with 245 inspections conducted, the Siberian Department applied 91 administrative penalties with 230 inspections conducted; the West Ural Department applied 106 administrative penalties with 250 inspections conducted.

According to Article 9.1 of Part 1 of the Administrative Code of Russia, administrative penalties were applied in the form of suspension of activities by court decisions in 39 cases, including 20 in the West Ural Department, 5 in the Central Department, 4 in the Lower Volga Department, 3 in the Upper Don and Siberian Departments, and 1 in the Caucasus, Volga, North-Western and Sakhalin Departments.

In compliance with requirements of RD 09-536-03 plans for localization and elimination of emergency situations (PLEES) are developed at supervised enterprises. At the same time, lack of approved methodologies to identify sufficient financial resources for localization and elimination of accidents is found.

Supervised organizations continue their activities on technical maintenance and emergency resistance of objects for transportation of hazardous substances, in compliance with the industrial safety requirements in force.

Emergency and technical classes are given based upon PLESS provisions, additionally included into the operating part regarding types of accidents, related to

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terrorist attacks, options of personnel actions are simulated as well as means of mobility improvement and security of the most vulnerable areas of the facility.

To ensure preparedness for localization and elimination of accident consequences at hazardous industrial facilities, large industrial enterprises created emergency response teams. Organizations which do not own any emergency response teams conclude contracts for this service with specialized emergency response organizations. However, there are problems related to servicing objects of transportation of hazardous substances by professional rescue organizations due to their remote location and insufficient number of specialists in the professional rescue organizations.

Control of security assurance at high-risk facilities from possible terrorist attacks is performed under supervisory activities. The inspections considered measures of arranging security assurance of the territories of the facilities and those of limitation of unauthorized access to hazardous substances.

Based upon the results of inspections held in 2013, it was identified that the organizations have planned and conduct measures of terrorist resistance in compliance with the established plans.

Supervised organizations arranged communication with Federal Security Service, Ministry of Internal Affairs, EMERCOM of Russia for unexpected circumstances as well as with medical institutions within the scope of agreements and urgently with the use of telephone and mobile communication through dispatching services and duty personnel.

Contracts for guarding services were found in the organizations. At large facilities with staging tracks for railway carriages, areas for transportation of hazardous substances are fenced which prevent strangers from unauthorized access to the facility, video surveillance systems are installed. Guarding services are equipped with arms and specialized tools in identified cases.

Areas of transportation are generally equipped with primary fire extinguishing tools, in compliance with the design documentation. Accounting and control of primary fire extinguishing tools are performed in compliance with the procedure established by the regulatory legal documents.

During routine and target inspections, the facilities were checked upon preparedness for preventing terrorist attacks aimed at HIFs. The inspections showed that all the organizations involved into transportation of hazardous substances have measures aimed at prevention of terrorist hazards as per location of the facility, number of staff and other indicators.

The basic of the applied measures are as follows:

- development of annual plans of measures aimed at prevention and elimination of sabotage or terrorist attacks at the territory of facilities, and approval of additional measures of anti-terrorist protection of facilities for weekends and holidays;
  - conduct of unscheduled inspections of compliance with the procedures of transport vehicles travel when transporting hazardous substances;
  - regular training of personnel of HIFs by accident elimination plans taking into account possible terrorist attacks; planning of financial expenditures on technical means of protection, such as: equipping with video surveillance tools, creation of additional fences preventing from unauthorized access by strangers.
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Large facilities hold training sessions in compliance with the approved schedules.

Due to the World Summer Universiade XXVII in the city of Kazan, in first half of 2013 additional training classes on PLEES provisions were held at chemical facilities with hazardous substances transportation areas supervised by the Volga Department. Assessment of professional actions and out-of-staff emergency response teams allowed making a conclusion regarding satisfactory emergency resistance of the areas of hazardous substances transportation.

In compliance with the work schedules of anti-terrorist commissions, representatives of the Siberian, Yenisey, Ural and Sakhalin Departments of Rostekhnadzor participated in inspections of anti-terrorist and anti-sabotage protection at supervised organizations.

However, inspections at facilities JSC NTP Baltica-Chelyabinks, JSC Uralmashzavod (rented by LLC PZhT-55) supervised by the Ural Department revealed lack of personnel preparedness to resisting nonstandard situations (terrorist threat, emergency situations, natural phenomena) as a result of which legal entities were held administratively liable as per Part 1 of Article 9.1 of the Administrative Code of the Russian Federation.

The most typical violations revealed in the course of inspections are as follows: absence of access restrictions for strangers in the area of purring operations, at the same time the entrance gates are absent or are constantly open; crossing floors of railways are in unsatisfactory condition; absence of video surveillance equipment, blocking and alarm systems; trainings with the personnel are not scheduled or are just formal.

No terrorist attacks and unauthorized access into HIFs supervised by Rostekhnadzor in the part of hazardous substances transportation were registered in the reporting period. The most significant problems of the supervision in the part of operation of areas of hazardous substances transportation are as follows: absence of regulatory legal acts identifying industrial safety requirements during transportation of hazardous substances; first of all, absence of updated Safety Rules for Railway Transportation of Hazardous Goods (RD 15-73-94), with amendments [PBI 15-461(73)-02]; of a regulatory document identifying the procedure of control and supervision over contracted organizations which perform assembly, maintenance, repair of non-public railways, repair of locomotives, maintenance and current uncoupling repair of carriages; absence of methodological recommendations on development of PLESS for areas of transportation of hazardous substances by railway and motor vehicles.

The following is proposed to make control and supervision of HIFs more efficient as well as to ensure safe transportation of hazardous goods, compliance by organizations with industrial safety requirements at facilities related to transportation of hazardous substances:

1. To take measures of development and approval of federal codes and regulations in the field of industrial safety, "Requirements to Safety Assurance of Technological Processes of Hazardous Substances Transportation at HIFs" to replace document "Safety Rules of Railway Transportation of Hazardous Goods" (RD 15-73-94), approved by Order No. 50 of Gosgortekhnadzor of Russia on August 16, 1994 (they do not require state registration, letter No. 07-01-590-94 of the Ministry of Justice of the Russian Federation, dated September 16, 1994), with amendments [PBI 15-461(73)-02] approved by Order No. 29 of Gosgortekhnadzor of Russia on June 20,

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2. With the aim to improve professional training to continue qualification upgrade of the inspector staff in the regional departments of Rostekhnadzor through workshops, training courses in specialized training centers; to improve the level of exactingness of the inspectors to the supervised organizations.

3. To continue cooperation of Rostekhnadzor with other federal executive bodies for industrial safety assurance in the supervised organizations.

4. To introduce amendments into the Preliminary List of Control of Technical Devices, Buildings and Structures for assessment of their compliance with the industrial safety requirements, it would be reasonable to apply non-destructive testing by replacing in item 9 the following term "Railway transportation facilities" into "Transportation facilities":

- in Appendix 1 to the Rules of Personnel Certification in Non-Destructive Testing (PB 03-440-02);
- in Appendix 1 to the Rules of Certification and Main Requirements to Non-Destructive Testing Laboratories (PB 03-372-00).

#### *2.2.17. Explosion Hazardous Facilities of Vegetable Raw Material Storage and Processing*

In the year of 2013 the number of supervised organizations (legal entities) working in the field of industrial safety at explosion and fire hazardous storage facilities and facilities for vegetable raw materials processing reduced and was 4,348 (4,612 in 2012), 4,132 of which (4,222 in 2012) work on operation of facilities; 117 (107 in 2012) on industrial safety review; 69 (77 in 2012) on design of facilities; 93 (B 2012 r. — 94) on training (re-training) of employees in non-educational institutions; 57 (63 in 2012) on assembly and adjustment of technical devices and technologies at facilities; 45 (40 in 2012) on manufacturing of technical devices, and 46 (59 in 2012) on construction (expansion, reconstruction, technical re-equipping) of facilities.

Total number of fire and explosion hazardous storage and vegetable raw materials processing facilities (hereinafter referred to as facilities) has also reduced to 10,570 (12,626 in 2012),

127 facilities (199 in 2012) are at the stage of temporary closedown, 57 (103 in 2012) facilities are at the liquidation stage.

Reduction in number of facilities is related generally to identification in the supervised organizations of facilities with the account of unique site of specific manufacturing and re-registration of facilities by hazard classes in compliance with requirements of Federal Law No. 22-FZ of March 2013, "On Introduction of Amendments into Federal Law "On Industrial Safety of Hazardous Production Facilities", Specific Legislative Acts of the Russian Federation and on Invalidation of Subitem 114 of Item 1 Article 3333 of the Second Part of the Tax Code of the Russian Federation."

As stated in the reporting materials of Rostekhnadzor regional departments, identification with assignment of appropriate hazard class has completed or is at the completion stage at the majority of the supervised enterprises.

For instance, according to the data of the West-Ural Department, in the Republic of Udmurtiya 100% facilities were re-registered, among 42 supervised facilities 10 were assigned to hazard class 3, 32 to hazard class 4; in the Kirov region 26 of 62 facilities were assigned to hazard class 3; in the Orenburg region 57 supervised organizations completed re-registration process, 25% of operated facilities were

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assigned to hazard class 3, 75% were assigned to hazard class 4.

In the year of 2013 one accident occurred at a supervised facility (no accidents in 2012), it lead to a group fatal accident; 4 fatal accidents were registered (5 persons died in 2013).

On July 21, 2013, when silage was fumigated at the seed plant of LLC Agrofirma Kama (the Republic of Tatarstan), an accident occurred (explosion of a dust, air and gas mixture which led to complete destruction of equipment), 4 persons were injured and one of them had fatal injuries. The economic damage of the accident was over 4 million rubles; the environmental damage was not identified.

The accident is characterized by the following circumstances.

The accident was preceded by activities held on July 17, 2013, by FSBE "Interregional Veterinary Laboratory of Tatarstan" (Republic of Tatarstan), it was fumigation of silage tanks of the said seed plant with the use of medicine Katfos (it was put into 24 silages, 4 of which were filled with seeds).

The investigation materials state that according to safety conditions (taking into account the period of action of Katfos), degassing of silages could have been started not earlier than on July 22, 2013, but in compliance with the organizational order acceptance of seed was held in the period of July 18 to 21, 2013.

According to the investigation materials, on July 21, 2013, the rain began at 15:45, it finished in fifteen minutes, and after it fire spots were found in the leftovers of seeds, cereal chaff and Katfos inside the gravity pipeline under the cones of the silages. Over half an hour later when the gravity pipeline of one of the silages had been cleaned, an explosion occurred in the lower chain conveyor.

One of the main causes according to the accident investigation commission was the excess of Katfos flow rate during silage fumigation and excessive moisture impact (including the rain water in the silages which were not completely leak tight), this lead to generation of the phosphine gas which is self-igniting when contacting the air oxygen.

The reasons of the event are generally caused by violation of the increased risk work procedures and of the technological processes. It was also caused by disregard of conditions, limitations and prohibitions related to activities with chemical substances.

Actually, LLC Agrofirma Kama created prerequisites for an emergency situation. Thus, investigation found that

- the management and specialists of FSBE "Interregional Veterinary Laboratory of Tatarstan" were not trained and qualified as per industrial safety of herbal raw material storage and processing facilities;
  - introductory briefing on labor protection was not held for the specialists of FSBE "Interregional Veterinary Laboratory of Tatarstan" before the silage fumigation; nobody was made in charge for production control, operation and condition of the facilities;
  - HIFs were not registered in the State Register of HIFs; there is no contract for obligatory third-party liability insurance, provision on organization and conduct of production control, accident elimination and personnel protection plans, and explosion safety technical passport;
  - Order No. 128/a-k of LLC "Agrofirma Kama", dated July 1, 2013, assigned responsible persons for preparation to fumigation, but those people were not familiarized with the Order.
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On August 19, 2013, when LLC Seed Terminal Handler of Taman (Krasnodar Region) performed repair at the chain truck conveyor, a service technician who was inside the conveyor repairing broken protective films was sucked into it. As a result of the fatal trauma, he died on the spot. On August 23, 2013, at JSC Agrofirma Doronichy (Kirov Region), due to a break in bran flow from the bunker (13 m height) into the production, a production operator went downstairs to beat of the bran stuck to the walls (without having any work execution permit and required protection means). After several beats, the vault of the product, which was 5-8 m higher than the operator, fell. The mass knocked down the operator from the rope ladder; he fell on the bottom of the bunker, buried by bran and died because of asphyxia. The investigation materials state that there were no safety cages on all the bunkers of the elevator and no special crab hoists for people to descend into the bunkers and to ascend.

On December 14, 2013, at LLC Elevator Kurbatovo (Voronezh Region), during repair the elevator was partially destroyed. It was followed by crash of a landing for its head servicing. There were chief power engineering specialist and seed treatment operator on the landing and they got lethal injuries.

The investigation showed that the elevator had been assembled without its design documentation; its structure was changed without any authorization (the manufacturer had not provided any landing for the elevator head servicing), the chief power engineering specialist of the enterprise was not qualified in industrial safety; the work was held without individual protective means, the personnel was not briefed on safe work methods and severe violations of the safety requirements were made during the activities.

The major organizational causes of lethal accidents in 2013 were the following:

- unsatisfactory organization of equipment repairs;
- non-fulfillment by officials of facilities, where lethal accidents occurred, of their job responsibilities and lack of their control over compliance with the industrial safety requirements during operation of the supervised facilities, low level of production control;
- violation by the employees of the industrial safety requirements, production and labor discipline, internal work regulations and ignoring of protection means and individual protection means by the injured personnel. The committed violations of the rules, codes and regulations on industrial safety which were the causes of the registered accidents and fatal accidents, were the reason to hold appropriate officials administrative liable.

Comparison analysis of the accidents by their types and causes is in tables 89–93.

**Table 89**

***Accidents by their types***

<b><i>Types of Accidents</i></b>	<b><i>Number of accidents</i></b>				<b><i>+/-</i></b>
	<b><i>2013</i></b>	<b><i>%</i></b>	<b><i>2012</i></b>	<b><i>%</i></b>	
Explosion	1	100	0	0	+1
<b><i>Total:</i></b>	<b><i>1</i></b>	<b><i>100</i></b>	<b><i>0</i></b>	<b><i>0</i></b>	<b><i>+1</i></b>



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*Accident by their causes*

*Table 90*

<i>Types of Accidents</i>	<i>Number of accidents</i>				
	<i>2013</i>	<i>%</i>	<i>2012</i>	<i>%</i>	<i>+/-</i>
Violation of work process procedures and technological processes	1	100	0	0	+1
<i>Total:</i>	<i>1</i>	<i>100</i>	<i>0</i>	<i>0</i>	<i>+1</i>

*Information on Breakdown of Fatalities by Injury Factors*

*Table 91*

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<i>Injury factors</i>	<i>Number of fatally injured, persons</i>				
	<i>2012</i>	<i>%</i>	<i>2013</i>	<i>%</i>	<i>+/-</i>
Asphyxia caused by bulk stock getting into the respiratory tracts	3	100	2	40	-1
Fall from a height due to unsatisfactory work arrangements	0	0	2	40	+2
Trauma as a result of an accident (explosion)	0	0	1	20	+1
<i>Total:</i>	<i>3</i>	<i>100</i>	<i>5</i>	<i>100</i>	<i>+2</i>

Investigations of accidents and fatal accidents were held by Commissions of the Regional Departments of Rostekhnadzor; their results were submitted to Rostekhnadzor Headquarters in the specified terms. Quality of the investigations is satisfactory.

**Table 92**

***Data on the accidents occurred at the supervised facilities (in the constituent entities of the Russian Federation)***

<i>Federal constituent entities of the Russian Federation</i>	<i>Explosion and Fire Hazardous Facilities of Vegetal Raw Material Storage and Processing</i>	
	<i>2012</i>	<i>2013</i>
<i>Privolzhskiy Federal District (Nizhniy Novgorod)</i>		
the Republic of Tatarstan	—	1
<i>Total in Russia:</i>	—	<i>1</i>
<i>(+) increase/(-) decrease:</i>	<i>+1</i>	

**Table 93**

***Data on fatal accidents (in the Constituent entities of the Russian Federation)***

<i>Federal constituent entities of the Russian Federation</i>	<i>Explosion Hazardous Facilities of Vegetable Raw Material Storage and Processing</i>		
	<i>2012</i>	<i>2013</i>	<i>+/-</i>
<i>Central Federal District (Moscow)</i>	3	2	-1
Kaliningrad Region	1	—	-1
Lipetsk Region	2		-2
Voronezh Region	—	2	+2
<i>Volga Federal District (the town of Nizhniy Novgorod)</i>	—	2	+2
the Republic of Tatarstan	—	1	+1
Kirov Region	—	1	+1
<i>South Federal District (the town of Rostov-on-Don)</i>	—	<i>1</i>	+1
Krasnodar Territory	—	1	+1
<i>Total in Russia:</i>	<i>3</i>	<i>5</i>	<i>+2</i>
<i>(+) increase/(-)</i>	<i>+2</i>		

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Based on the results of analysis of the investigation materials, the said regional departments of Rostekhnadzor received letters No. 08-00-10/1648 (dated October 28, 2013) and No. 00-04-05/115 (dated January 20, 2014) stating it was necessary to inform the supervised organizations about the accident and injury rates and to require from them some urgent response arrangements to prevent accidents and injuries caused by the same factors as in 2013.

The total amount of accidents registered in 2013 is 134 (242 in 2012), 70% of which are related to a failure or damage of technical devices; the others were caused by deviations from the technological process regime. However, the mode of some accidents proves underestimation of risks related to generation (ignition) of explosion hazardous dust and air mixtures and neglect to explosion preventive measures (explosion protection).

On April 29, 2013, when JSC Irkustkiy Maslozhyrcombinat (Irkutsk Region) performed hot works and assembly of drive station of a drag conveyor at the meal elevations, there was a snap leading to a group accident. As a result, 4 employees of the assembly organization LLC Bazet (town of Angarsk, Irkutsk Region) were taken to hospital with thermal burns of different levels of gravity (from 15 to 25 % of the skin burnt). The accident resulted in damage of equipment, but no destruction of the building structure was registered.

On October 23, 2013, there was a snap at the all-mash production facility JSC Cereal Products Combine of Belgorod (Belgorod Region). It led to a group accident with three employees receiving thermal burns of different gravity. They were taken to hospital. No damage to equipment and building structures occurred.

On December 17, 2013, there was a snap at the seed loading complex (elevator) of JSC Stroykomplekt Combine (town of Novorossiisk, Krasnodar Region) which was intended for loading cereals on sea transport. No damage to equipment and building structures occurred.

Generally, the legal procedures of industrial safety regulation during operation are fulfilled: All the organizations operating facilities have contracts of obligatory third-party liability insurance for damages in case of accidents at HIFs, accident elimination and personnel protection plans, provisions on production control over compliance with the industrial safety requirements, technical passports of explosion safety and arrangement plans on bringing the objects to the level of the industrial safety requirements (they are developed or are being developed).

Generally, industrial safety at facilities is satisfactory. But the facilities are in different state. It generally depends on the year when they were commissioned and reconstructions, technical re-equipping and capital repairs.

In the year of 2013 reconstruction and technical re-equipment was held at 63 facilities (57 in 2012), including the following: JSC Bulgarpivo and all-mash plant JSC Cereal Products Combine of Schigry; expansion of production at LLC KFH Agat, LLC KFH Zarya, LLC Zlatko and LLC Agromarket; reconstruction of the seed plant of JSC Sovetskaya MTS; reconstruction of the elevator at FSPI Combine Amure; adjustment activities at JSC Beer Production Company Baltica - Baltica-Khabarovsk; reconstruction of the all-mesh shop at FSE Combine Amur of Rosreserv; upgrade of drying and sorting complex at LLC Millenium; technical re-equipment at JSC Kazanzernoprodukt; replacement of equipment with ended service life at JSC Flour Mill Plant of Perm and JSC Poultry Farm Permskaya; technical re-equipment of meal bodies with replacement of transportation equipment at LLC All-Mash Plant of

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Glazov; technical re-equipment of timber products and spares and chip wood plate production shop at LLC PO Izhmebel, etc.

However, the analysis showed that the number of facilities under construction reduced to 26 in 2013 (45 in 2012).

In 2013 there were 2,667 inspections (3,010 in 2012) held by regional departments of Rostekhnadzor and aimed at legal entities and individual entrepreneurs; 1,081 of those inspections were unscheduled (1,289 in 2012).

The inspections revealed and prescribed to eliminate 12,944 violations (14,387 in 2012), 978 of which (1,018) are those when supervised enterprises did not fulfill Rostekhnadzor prescriptions.

Thus, when in 2013 the North-Caucasus Department held 77 inspections in the Krasnodar region and 11 in the Rostov region to check whether the earlier issued prescriptions were fulfilled, it found 12 cases when they were not fulfilled in the specified period (at JSC Kholmsky Elevator, JSC Poltavskiy Elevator, JSC Kurganinskiy Elevator, LLC KH Uchastiye, LLC Ugmelprodukt, JSC Angelinskiy Elevator, etc.), guilty legal entities and officials were held administratively liable.

1,217 administrative penalties issued upon the results of inspections (1,328 in 2012), including 91 (84 in 2012) administrative suspensions of work, and 1,123 (1,230 in 2012) administrative fines (914 to officials and 156 to legal entities).

Based on the results of the inspections held by regional departments of Rostekhnadzor, there were issued and handed final inspection acts, prescriptions on elimination of revealed violations of requirements established by the legislation and regulatory and technical documents in the field of industrial safety.

Administrative suspension was most actively applied by the Siberian Department: 17 suspensions (JSC Tabunskiy Elevator, JSC Melnik, LLC Razdolie, JSC Uspenskiy Elevator, JSC Byjskiy Elevator, LLC PlastProm NSK, LLC Bolotnoehleboprodukt, LLC Molt Gruppa, LLC PKF Posevnoyhlebprodukt, JSC Omskhlebprodukt, etc.), the Volga Department: 10 suspensions (JSC Kurkachinskoye HPP, LLC Gazovik, LLC Markorm, JSC Naberezhnochelninskiy KHP, etc.), and the Lower Volga and the Central Departments.

The amount of the imposed administrative fines totaled 42,659 rubles. (49,184.3 rubles in 2012). The amount of the exacted administrative fines totaled 30,987 rubles.

The analysis of supervisory activity indicators at facilities is provided in table 94.

**Table 94**

***The analysis of supervisory activity indicators at facilities***

<b><i>Indicator</i></b>	<b><i>Storage and Processing of Vegetable Raw Material</i></b>		
	<b><i>2012</i></b>	<b><i>2013</i></b>	<b><i>%</i></b>
Inspections performed	3,010	2,667	-11.4
Violations revealed	14,387	12,944	-10.0
Administrative liability	1,328	1,217	-8.3
The sum of penalties imposed (million rubles)	49.18	42.65	-13.2
Administrative suspensions	84	91	+ 8.3

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The indicator analysis of supervisory activity shows that in 2013 the number of those made administratively liable for industrial safety requirements violation slightly reduced (8.3 %), however, the number of suspensions issued to facilities which violated the established codes and regulations 8.3 % increased.

Production control over compliance with industrial safety requirements in compliance with Article 11 of Federal Law No. 116-FZ, dated July 21, 1997, "On Industrial Safety of Hazardous Industrial Facilities", is arranged at almost all the enterprises operating the supervised facilities.

The Upper Don Department notes the following organizations as an example of positive arrangement of production control: JSC Efirnoye, LLC All-Mash Plant of Prohorov, JSC All-Mash Plant of Novy Oskol; JSC Elevator; JSC Kolos, JSC Novoborisovskoye HPP, LLC Belgorsolod, where they regularly hold internal inspections of safety state of process and transport equipment systems, of aspiration and ventilation installations, of technical means for control of safe operation of equipment and explosion protection means.

The Volga-Oka Department notes satisfactory work and production control at large enterprises of the Nizhny Novgorod Region (LLC Flour Milling Combine Volodarskiy, LLC Bugrovskiy Melnitsy, LLC Agrofirma Pavlovskaya, JSC Sergachskiy Elevator, JSC All-Mash Plant of Ilnogorsk Izkorm, LLC Pervaya Melnitsa, LLC Flour Milling Plant of Bashkirov, JSC Khleb) and the Republic of Mordovia (JSC All-Mash Plant of Kovylkino, Torbeyevo Elevator GUP RM "Razvytye sela", JSC SAN In Bev, JSC Saransky Elevator, JSC Khlebnaya Baza, JSC SKMI, JSC APO Elekom, JSC Poultry Farm Atemarskaya).

The majority of supervised enterprises timely send their reporting documentation on production control at their facilities.

At the same time, according to the data of the Yenisey Department, the scheduled inspections at supervised facilities at JSC Krasnopolanskoye and JSC Krassoya identified that the production control had not been performed, the schedules of control and prevention checks had not been developed, and reports had not been sent to Rostekhnadzor.

The Siberian Department noted violations in production control in the following organizations: LLC Kalmanskiy KHP, LLC Celeon, IE (individual entrepreneur) Zhdanov S.M., IE Shimolin V.A., IE Privalov V.I., JSC Biyskiy Elevator, LLC Pankrushihinskoye HPP, LLC Burlinskiy Elevator, LLC Belovskiy Elevator, and LLC Poultry Farm of Insk, and by a number of other departments of Rostekhnadzor.

As the analysis showed, the major drawbacks in the arrangement of production control are formal document keeping on production control which is to be developed at supervised facilities as per provisions on the production control (for example, JSC Kamenskoye, LLC Nekrasovo, LLC Agrofirma Artemovskaya, JSC Agrofirma Patrushi, JSC Chernoglazovskiye Melnitsi, LLC Zdvinskoye HPP, IE Dirksen I.Ya., JSC Melnitsa, JSC Krasnoshchekovskoye HPP, etc.). This does not have any positive impact on the level of safety assurance at the facilities in the face of non-analyzing the results of internal inspections (for instance, at LLC Zaozernovskiy Elevator, JSC Arsk Elevator, JSC Bugulminskiy KHP No. 2, JSC Cheboksarskiy h/k, JSC Kamenskoye, JSC Kosulinskoye, LLC Agrofirma Artemovskaya, etc.). At the majority of enterprises with small number of personnel, production control is often ineffective or not organized (for instance, at JSC Agrokompleks Mayak, LLC

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Selozpredripyatye Pokrovskoye, LLC Tumentehsnab, etc.).

However, as the Upper-Don Department states, to save financial resources the production control of such facilities is on the employees of the organizations and it has the form of additional duty. Hence, the specialists with the functions of production control, they do not check equipment status of control devices and explosion protection means, compliance with the equipment operation terms, availability of fences on the moving parts of the production equipment.

Decree of the Government of the Russian Federation No. 526 of June 21, 2013, "On amendments and invalidation of some acts issue by the Government of the Russian Federation" introduced changes and amendments into the Rules of Production Control over Compliance with Industrial Safety Requirements at HIF (approved by Government Decree No. 263 of March 10, 1999) regarding obligatory arrangement and conduct of production control as well as specific requirements to the contents of the Provisions on Production Control.

Improvement of efficiency of arrangement and conduct of production control and monitoring of elimination of violations of the actual industrial safety requirements will help in increasing the safety level of the facilities and reducing the risk of emergencies, hence, in minimizing threats to life and health of the personnel at the facilities and other people. In the year of 2013 the regional departments of Rostekhnadzor studied 3,515 industrial safety review reports for the supervised facilities (3,154 in 2012), 2,165 of which (1,961 in 2012) were industrial safety review conclusions for technical devices, 748 reviews of other documents related to operation of the facilities, 1,343 reviews of buildings and structures at the facilities (391 in 2012), 275 reviews (294 in 2012) of design documentation.

The regional departments of Rostekhnadzor approved 3,149 (2,897 in 2012) industrial safety review reports for facilities, denied to approve 366 (257 in 2012) review reports. The major causes of denials are as follows: violation of requirements to industrial safety review, participation of experts who were not certified in the appropriate procedure.

In compliance with Federal Law No. 225-FZ dated July 27, 2010, "On compulsory civil liability insurance of owners of hazardous facilities for any harm inflicted as a result of an accident"; civil liability is insured against damage to life and health or property of third party and to the environment because of an accident.

Many regional departments of Rostekhnadzor note that contracts of compulsory civil liability insurance are absent at facilities which are temporarily shut-down or bankrupted (JSC Poultry Farm of Myskov, LLC Omskhlebmelmontazh, LLC Sibirskiy Melnik, LLC Titan, LLC Kontakt Muka, LLC Perevozhskoye HPP, JSC Alcohol Plant of Chuguny, LLC Samayevskiy, LLC Medayevskoye, LLC Syzranskiy KHP, JSC Alekseyevskoye HPP, IE Sanatullof, LLC Stroydetal, LLC Regionservis, LLC Arsenal, SPK Zarya, JSC Uspenskiy Elevator, LLC Zeleniy Dol, JSC KIM, IE Grigoryan O.V., LLC Leronya Trading, etc.).

Problems related to civil liability insurance of facilities in operation are stated by the Caucasus Department of Rostekhnadzor at several facilities of the Republic of Dagestan.

Taking into account that upgrade of the major funds and improvement of explosion protection level of technological processes are the major tasks of the long-term social and economic development concept in Russia, special attention is paid to the control over the supervised facilities fulfilling the plans on bringing the facilities

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into the line with the regulatory requirements of industrial safety.

Generally, the following measures were taken at the supervised facilities:

- bringing to the regulatory requirements of the areas of light removable structures at facilities of JSC Liubovskiy Elevator, JSC Chernoglazovskiy Elevator, LLC Evsinskiy KHP, Poultry Farm after 50th Anniversary of the USSR, LLC Hlebniy Dvor, JSC Bolotnoyehleboprodukt, LLC PK Gerkules, JSC Gylevskiy Elevator, JSC Tretiakovskiy Elevator, LLC Novokuznetskiy KHP, JSC Tresvyatskoye Hlebopriyemnoye, LLC Elevator AgroSelMash, JSC Rayevskiy Elevator, LLC Mihaylovskiy ZPK, JSC Tretyakovskiy Elevator, JSC Korotoyakskiy Elevator, LLC SO Ust-Kalmanskiy Elevator, FSE Combine Aurora, JSC Tabunskiy Elevator, LLC Arbuzovskiy Elevator, JSC Biyskiy Oil-Extracting Company, JSC Melnik, etc.;
- equipping with control and explosion prevention devices of facilities of JSC Hlebnaya Baza, LLC Saranskiy Elevator, JSC Elevator Ramonskiy, LLC Svinokompleks Prygorodniy, LLC PTF Murmanskaya, JSC Bread Products Combine of Murmask, LLC Svinokompleks Prygorodniy, JSC Agrofirma Industriya, LLC Talovskiy Elevator, LLC Abramovskiy Elevator, JSC Grain Storage No. 67, etc.;
- installation of magnetic fences during acceptance of raw materials at facilities of JSC Liubovskiy Elevator, JSC Chernoglazovskiy Elevator, LLC PK Gerkules, JSC Tabunskiy Elevator, JSC Ufimskiy KHP, JSC Tretyakovskiy Elevator, JSC Shipunovskiy Elevator, JSC Aleyskzernoprodukt, LLC Arbuzovskiy Elevator, JSC Tabunskiy Elevator, JSC Altayskiy Broiler, JSC Korchinskiy Elevator, etc.;
- installation of entry gates at facilities of JSC Khlebnaya Baza, Torbeyevskiy Elevator, GUP RM Razvytye Sela, JSC Borisoglebskiy Khelbprodukt, GUSP Farm Roshinskiy, etc.

Technical re-equipment of supervised facilities and their explosion protection improvement with the help of state-of-the-art design solutions, technologies and equipment reduces the risk of accidents and fatal traumas.

Still, scheduled inspections held by departments of Rostekhnadzor found cases when the plans for bringing the facilities in line with the regulatory requirements had not been fulfilled.

Thus, the Yenisey Department noted that LLC All-Mash Plant of Krasnoyarsk had failed to fulfill the required amount of arrangements related to installation of devices for control of chain break at scraper conveyors, break devices on bucket chains and magnetic protection at the motor vehicles acceptance area; LLC Grain Mill Plant of Achinsk had not installed additional explosion relief devices on the bucket chains in the all-mash production shop, discharge pipelines of additional explosion relief devices of the bucket chains of the elevator had not been put outside the production premise, the areas of light removable structures of the elevator and dry and cleaning tower had not been brought in line with the regulatory requirements; JSC Krassoya had not put the explosion relief devices of the bucket chains outside the production premise and had not prepared their passports; LLC Elevator had not brought the areas with light removable structures in the storage basements under the silage buildings No. 1-4 in line with the regulatory requirements; the system of remote seed temperature control had not been completely restored in the silages, additional explosion relief devices had not been installed on the bucket chain, the aspiration

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system ventilators (installed in front of the dust separators) had not been replaced in buildings No. 3-4 by spark proof ones.

Many regional departments of Rostekhnadzor note that lack of financial resources has negative impact on timely fulfillment of measures aimed at bringing the supervised facilities in line with the safety regulatory requirements.

However, according to the data of the Caucasus Department, frequent changes of owners of some supervised facilities makes it difficult to eliminate identified violations in the Republic of Dagestan.

Administrative penalties were applied by departments of Rostekhnadzor to everyone who had violated the industrial safety requirements.

Measures on localization and elimination of accident consequences are scheduled at the supervised organizations and fulfilled at appropriate level.

As a rule, the organizations operating facilities conclude contracts for their maintenance with professional emergency response teams (ERT) and units for the public defense and emergencies of the Russian Federation (for example, MUP SpatsTsentrZaschita, FBE Emergency Rescue Service of the Republic of Bashkortostan, SFSI 16th unit of the Federal Boarder Service in the Republic of Bashkortostan, fire service of the EMERCOM) as they do not have their own rescue teams.

Some facilities supervised by the West-Urals Department had difficulties with contracting professional ERTs as they are located in remote districts.

Taking into account that opportunities for emergency response of ERTs are quite limited in case of an accident, it is reasonable to create own out-of-staff rescue units.

Facilities registered in the Republic of Dagestan can be used as a positive example: over 90% of facilities there (taking into account their specifics as small production capacity and small number of servicing personnel which is not more than 15 persons) have own out-of-staff ERTs made up of the servicing personnel.

In accordance with the accident elimination and personnel protection plans developed at all the facilities, training sessions are held for the servicing personnel as well as emergency exercises on localization and elimination of accidents to work out skills which would ensure reliable operation.

Emergency training exercises are held at some facilities together with the units of fire services of the EMERCOM of Russia (LLC Malt Production Plant of Ostrogozhsk, JSC Elevator, JSC Podgorenskoye HPP, JSC MK Voronezhskiy, JSC Grybanovskoye HPP, JSC Elevator Ertilskiy, JSC Kantemirovskiy Elevator, JSC Latnenskiy Elevator, JSC Tulinovskiy Elevator, JSC Brewing Company Baltika - Baltika Saint Petersburg, JSC British American Tobacco SPb, JSC Philip Morris Izhora, etc.).

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The Upper-Don Department notes that in compliance with the accident elimination and personnel protection exercises plans, in 2013 JSC Verhnehavskiy Elevator conducted a training exercise to improve the actions to be taken by out-of-staff rescue teams, voluntary fire brigade and personnel of the organization in case of fire in the building of the all-mash shop. 90 people of the personnel of the operating organization took part in the training as well as those from Municipal Health Care Institution MUZ Verhne-Havskaya Central Deistrict Hosptal, fire unit No. 36 of the Verhne-Havskiy District of the Voronezh region, a fire brigade car and bus of JSC Verknehavskiy Elevator, a car of fire brigade No. 36 and 2 cars of the ambulance.

Many facilities are equipped with fire alarm system (HIF FSE Combine Amur, branch of Amur-Pivo LLC PK OPH, IE Karzhitskiy, JSC Ipatovskiy Elevator, JSC Novoaleksandrovskiy Elevator, JSC Izobylnuyhelbprodukt, JSC Krasnogvardeiskiy Elevator, JSC Divenskiy Elevator, etc), with fire detection systems (JSC Saburovskiy KHP, JSC Zherdevskiy Elevator, JSC Tokarevskiy KHP, JSC TAKF, JSC TALVIS, JSC Demetra, etc), with light alarm, fire alarms, fire extinguishing systems (fire line, hydrants), primary firefighting facilities.

Some facilities have their own fire engines (JSC Playwood Mill of Ust-Izhorsk, JSC Gatchinskiy KKZ, etc.), but there are not many.

The Upper Don Department notes that equipping of the supervised organizations with the fire alarm, automatic fire extinguishing devices and fire detection systems as well as systems of automatization of technological processes and lightening protection generally meets the design solutions (for instance, JSC Saburovskiy KHP, JSC TALVIS, JSC Demetra).

The Volga-Oka Department notes that there are unsolved issues related to preparedness of the enterprises for localization and elimination of possible accidents at facilities of SHPK Ural, LLC Zdorovie, JSC Kurkachinskoye HPP, LLC Tatmit Agro, JSC Bugulminskiy Elevator. The major of those issues are related to reduction or elimination by the owners of staff emergency rescue units (fire brigades); absence at the majority of the facilities of means and equipment for localization and elimination of accidents in silages, absence at out-of-staff ERTs of some facilities of required technical means for silage and bunker accident elimination; unprepared acts upon the results of training exercises with the analysis of personnel actions under an emergency.

At some facilities supervised by the Middle Volga Department there are difficulties related to restoring of broken fire alarm installations (JSC Obsharovskiy Elevator, JSC Syzranskiy KHP, JSC Bezenchukskoye HPP, JSC ZK Samarahlebprodukt, JSC Bread Plant of Zhiguliovsk, LLC Regionservice, LLC Stroydetal, IE Sanatullov, IE Zvyagin, LLC StroyplastmassAgroprodukt, LLC Hlebprodukt) that is related to insufficient financial resources.

The Upper Don Department notes that supervised cereal receiving plants in difficult financial situation (JSC Vernadovskoye HPP, JSC Muchkapskiy KHP, LLC Platonovskiy Elevator) are not equipped, it is also related to absence of constant leadership and specialists.

Fire alarm usually lacks at facilities operated by different organizations. Selector communication is unavailable at LLC PTF Murmanskaya and LLC Svinokompleks Prygorodnuy. It cannot be repaired due to absence of spare parts of an obsolescent modification of loud-speaking communication tools. At some facilities under their

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control poor attention is given to protection and resistance of the facilities, including the following: poor equipment with urgent alarm system at LLC ChMKF Vavilon, JSC Kyatskoye, JSC PPZ Kanashskiy, JSC Aktashskoye KZPZ, JSC AF Kyrlyay; no training sessions for the personnel on accident localization and elimination plans at the HIFs (LLC Trud, LLC Tatmit-Agro); terms for training sessions with the personnel on accident elimination are not held at LLS Agrofirma Kama, JSC Kazanjzer-nanoprodukt, LLC AKKOND, LLC Agrofirma Paran'ga.

The Volga Department imposed administrative measures on such facilities in the form of administrative penalties to legal entities and officials, and prescriptions for elimination of drawbacks are issued.

The majority of organizations operating supervised facilities have financial and material resources to localize and eliminate accident consequences.

Facilities which work scarcely are the exception (for instance, JSC Obsharovskiy Elevator, JSC SV-Povolzhskoye, LLC Syzranskiy KHP, LLC Skandi, JSC Alekseyevskoye HPP, LLC StroyplastmassAgroprodukt, IE Sanatullov, LLC Hleboprodukt, IE Zvyagin, LLC Stroydetal, LLC Regionservis, etc.).

Analysis of technical condition of the facilities showed that the major problem for the majority of the organizations was run out of major funds and lack of finance for reconstruction and technical re-equipping, so funds are renewed quite slowly.

Thus, for example, the Oka Department of Rostekhnadzor notes that at such facilities as PK Yasnogorskoy Hlebozavod, JSC Kimovskoye HPP and LLC Cereal Company of Tula the schedules of measures aimed at bringing HIFs in line with the industrial safety codes and requirements is accompanied by serious difficulties, mainly, due to poor financial conditions. According to the information from the West Urals Department, supervised facilities of the Orenburg Region, Perm Region, Kirov Region, and the Republic of Bashkortostan continue to operate technical devices with expired service life period. Replacing of those elements is complicated by continuous reduction of stored amounts and processing of raw materials, hence, lack of finance. There is also no positive impact on such issues by the fact that the owners of the said facilities are located out of the said regions.

There is also a serious decline in agrarian-industrial industry in the Republic of Dagestan, which is regulated by the cereal market according to the data from the Caucasus Department. Lack of cereal funds has got a negative impact on work load of the shops engaged into cereal processing, in some cases unprofitability of production does not make it possible to cover the production expenses and payroll bill. At some facilities supervised by the Siberian, Urals, North-Caucasus, Middle Volga, Caucasus, Upper Don, North-Western Departments of Rostekhnadzor there is often rotation of the production personnel and reduction of its number. Together with low salaries and poor professional training (actually, there are no branch professional technical colleges) do not promote mastering of innovative technologies and advanced methods of arranging technological processes as well as increasing of labor culture level.

So supervisory practice showed that explosion protection level increase is still of priority at the supervised facilities.

In September 2013 the topics of industrial safety assurance at facilities, improvement of legislation and regulatory control in the area were discussed at the 12th International Scientific and Practical Conference, "Topical Issues of Modernization and Technical Re-Equipment of Facilities Soring and Processing



Cereals and Grains and Their Industrial Safety Assurance" which is annually held by the Cuban Branch of All-Russian Scientific and Engineering Institute of Cereals and its Processing Products (VNIIZ) of the Russian Academy of Agriculture.

Federal codes and regulations in the field of industrial safety, Safety regulations for explosion and fire hazardous industrial facilities for storage and processing of herbal raw material" (Approved by Rostekhnadzor Decree No. 560 of November 21, 2013, registered in the Ministry of Justice in December 16, 2013, registration No. 30606) were developed to bring in line industrial safety requirements at HIFs related to storage or processing of vegetable raw materials with the actual legislative acts of Russia to reduce the risk of accidents and the scale of their possible consequences.

The document comes into effect 6 months after its official publication. It gives the opportunity to get familiar with it so that the supervised facilities would be able to study the industrial safety requirements of the document to implement them in operational practice.

As a major mid-term task, it would be reasonable to increase efficiency of coordination of the state supervision, science, production in relation to accident resistance of the supervised facilities, improvement of means and methods of explosion localization and prevention of grain and its products self-ignition as well as in implementation of objectives, tasks, plans and development programs of economic activities in Russia (within its competences).

#### 2.2.18. Facilities with Pressure Equipment

Rostekhnadzor and its regional offices supervise 22,000 organizations (legal entities) which work in the field of industrial safety, including 19,663 organizations operation HIFs.

The number of equipment operated by she supervised facilities and organizations amounts to 400,413 pieces, which includes: boilers - 72,936, including 6,538 foreign-made boilers, pressure vessels - 293,064 (including those with fast-removable heads - 5,421), including 57,593 foreign-made ones (including those with fast-removable heads - 1,125), steam and hot-water pipelines - 32,659 with a total length of 10,394.47 km, gas-filing and gas-cylinder test stations - 1,754.

The ratio of technical devices by their types is presented Figure 19.

Industry in Russia is in constant development; its production capacity steadily grows. The need to increase production capacity leads to the growth of supervised technical devices.

The dynamics of changing the number of technical devices as well as by their types is provided in Table 95 and Figure 20.



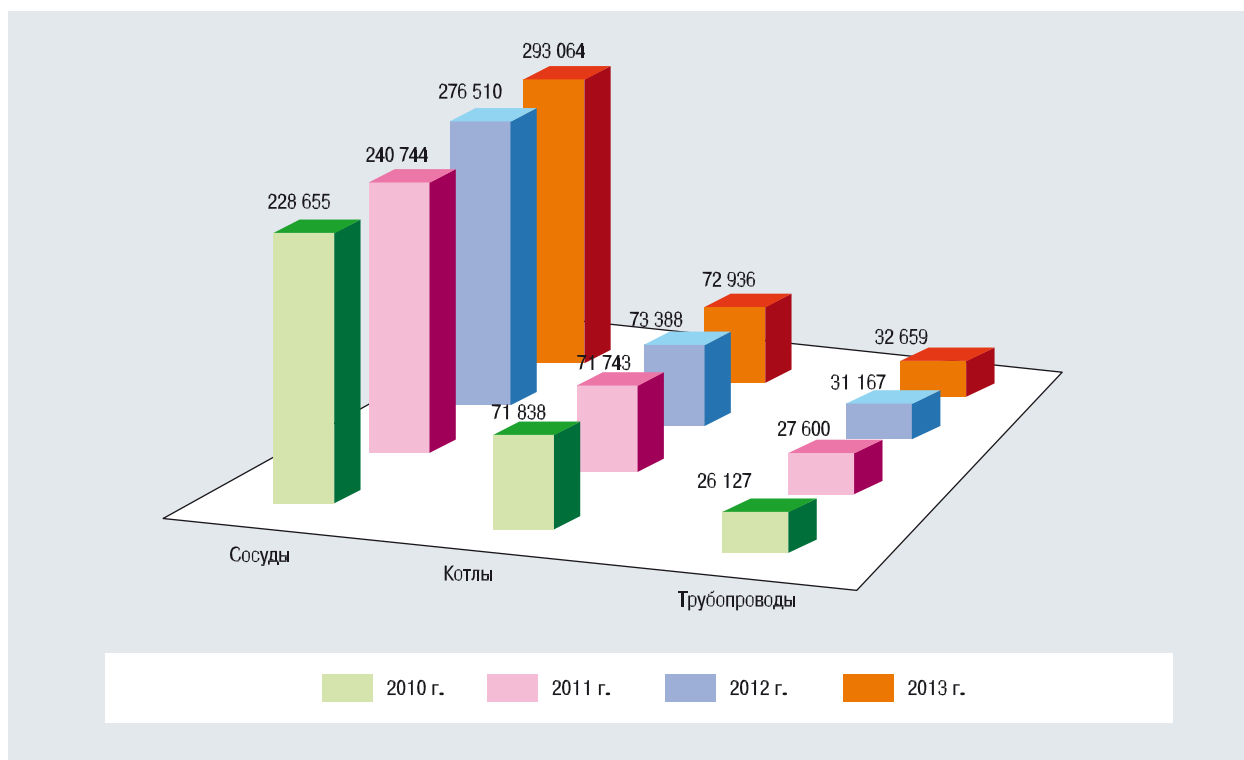
Fig. 19. Ratio of technical devices by their type

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**Table 95**  
***Types of supervised technical devices***

<i>Name of technical devices</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
Steam and hot water boilers	71,838	71,743	73,388	72,936
Pressure vessels	228,655	240,744	276,510	293,064
Steam and hot water pipelines	26,127	27,600	31,167	32,659
Gas-filing and gas-cylinder test stations	2,398	1,790	1,805	1,754
<i>Total:</i>	<i>329,018</i>	<i>341,877</i>	<i>382,870</i>	<i>400,413</i>

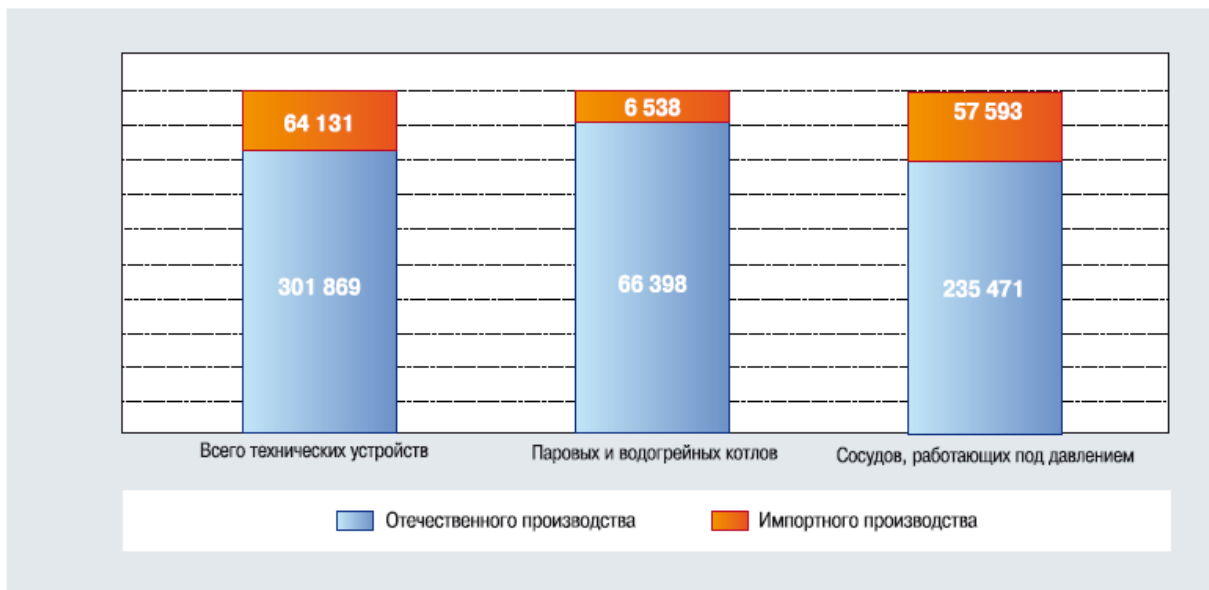
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**Fig. 20.** Dynamics of changing the number of technical devices

As the reporting data show, as per January 1, 2014, the ratio of foreign excessive pressure equipment at HIFs of Russia is 17.5 %. The major part of foreign equipment (15.7 % of total amount of supervised technical devices and almost 90 % of all the imported equipment) is represented by pressure vessels, as almost all the steam and hot water pipelines at the supervised organizations (finalized or assembled) are produced directly in the area of operation, and the percentage of imported steam and water boiling vessels is about 10 % of the number of imported technical devices (less than 2% of the total amount of supervised technical devices).

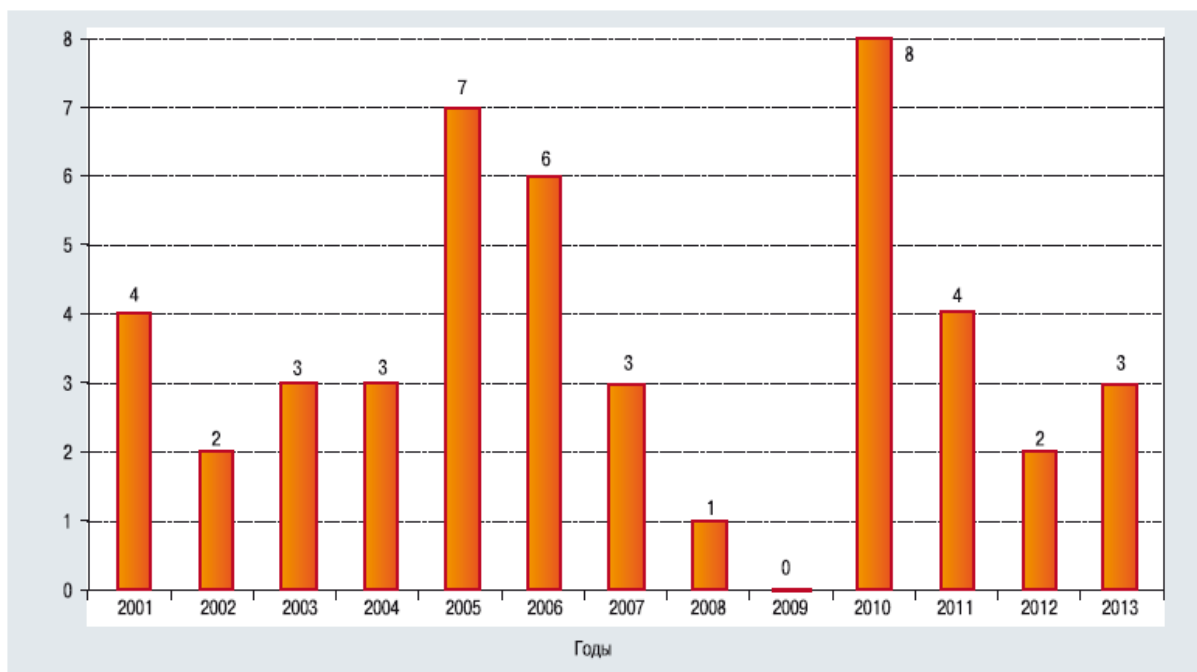
Figure 21 shows that Russian HIFs generally operate pressure equipment of Russian production; the ratio of steam and water boilers of foreign production is about 9.8 % of the total amount, the ratio of imported pressure vessels is 24.5 % of the total amount of vessels in operation. One of the major tasks of Rostekhnadzor in industrial safety is to ensure protection of vital interests of individuals and society from accidents at HIFs and their consequences. In order to use it, the accidents during HIFs operation are registered, then the results of their technical investigation are analyzed, and measures are developed to eliminate accident consequences and to perform preventive measures aimed at preventing accidents at HIFs in operation.



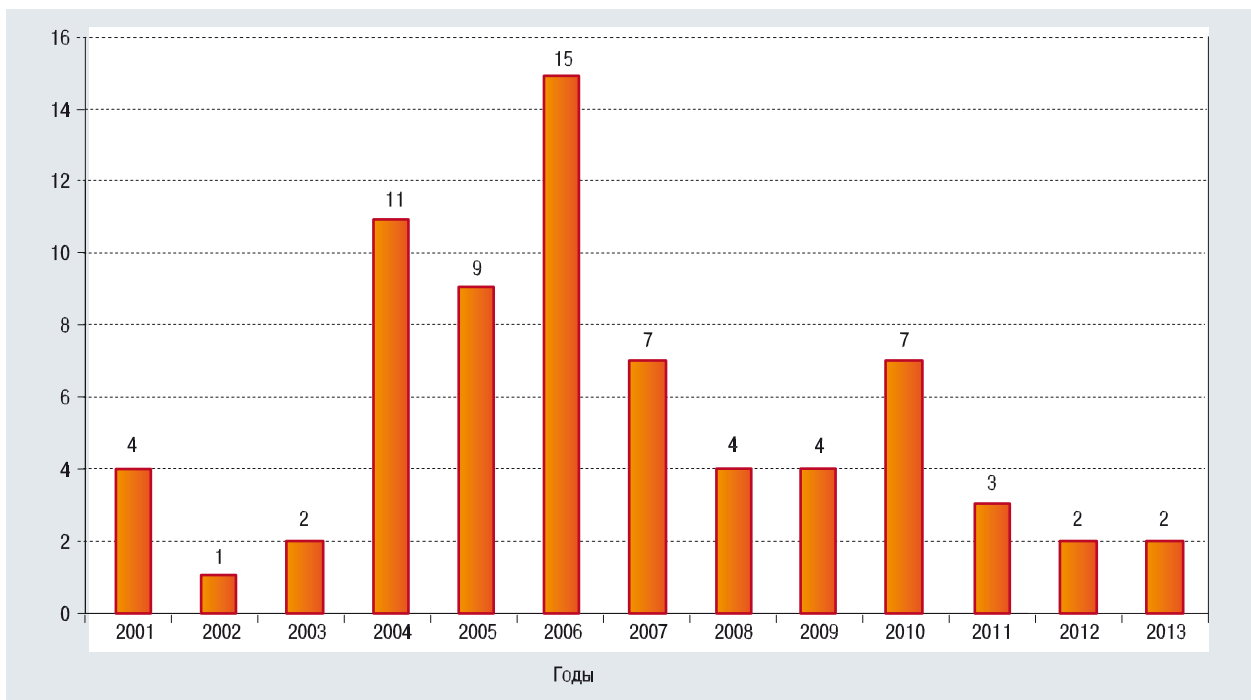
**Fig. 21.** The ratio of Russian and imported technical devices

The reporting data were used to analyze accident and trauma rates during operation of excessive pressure equipment in the period since 2001 to 2013 inclusive (figure 22).

The analysis results demonstrate that there were 46 accidents (figure 22) and 80 casualties at the supervised facilities over 13 years, 71 of the casualties (figure 23) were fatal.



**Fig. 22.** The dynamics of accident rate of supervised boiler facilities in operation



**Fig. 23.** The dynamics of fatal trauma rate of supervised boiler facilities in operation

104 persons were injured over 13 years (figure 24), among them:

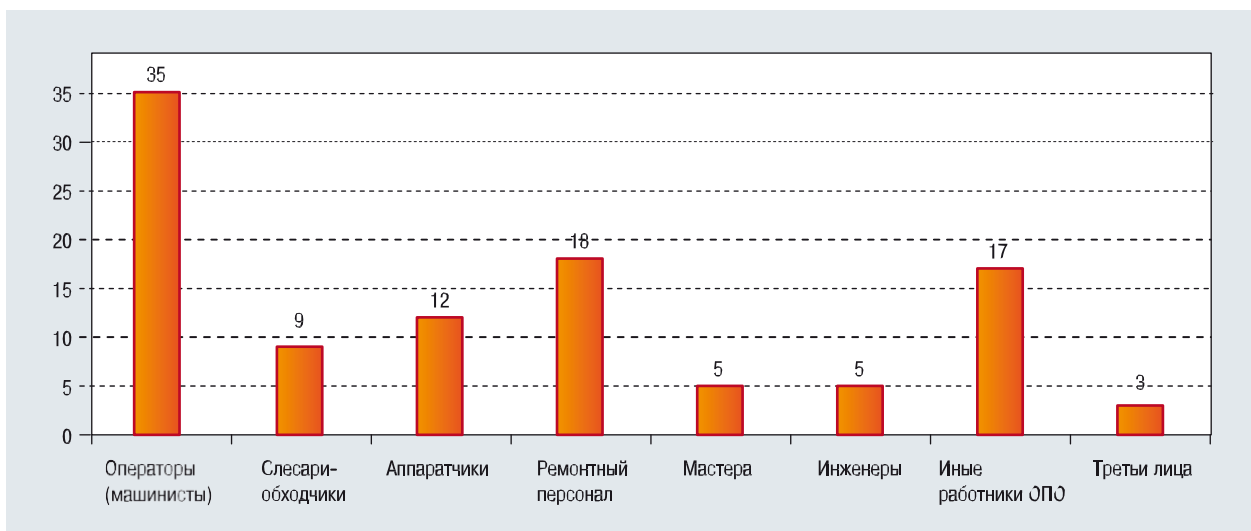
74 persons of staff servicing technical devices;

10 engineering and technical specialists who were responsible for arrangement of safe operation of technical devices;

17 employees of organizations, where accidents occurred, were not related to operation of excessive pressure equipment;

3 persons were not in staff of the organizations where the accidents occurred.

Personnel servicing such equipment were injured more often because of accidents occurred during excessive pressure equipment operation (74% of the total amount of injured).



**Fig. 24.** The categories of injured employees over 2001–2013



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The major number of injuries in the course of excessive pressure equipment operation (43% of the total amount) was caused by thermal impact of the working medium on the injured persons. Figure 25 demonstrates data on ratio of number of accidents depending on their trauma factors.

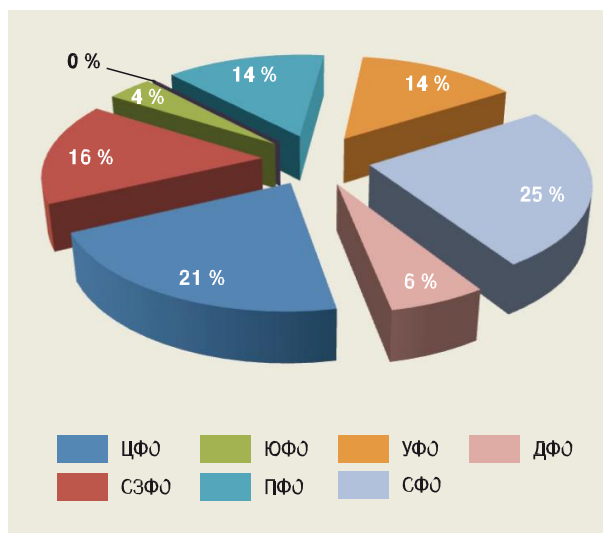
Distribution of accidents and casualties by RF Federal Districts is shown in Figures 26-27.

As per the reporting data, the largest amount of accidents in the period of 2001-2013 was registered in the Siberian Federal District (figure 26), the largest amount of casualties was registered in the Siberian and North-Western Federal Districts (figure 27).

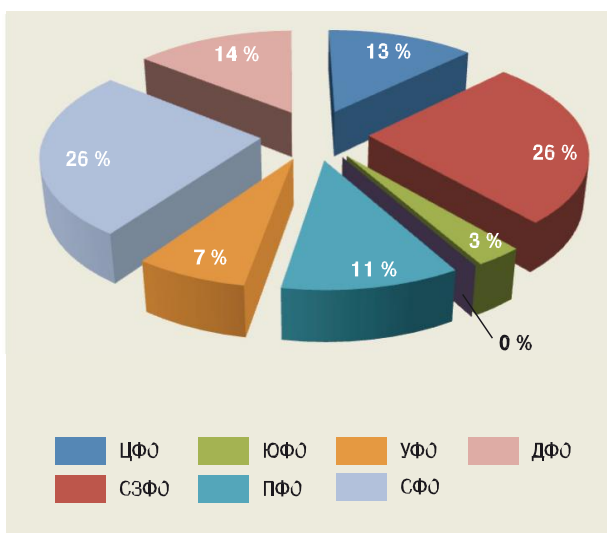
Figure 28 demonstrates accident distribution depending on the type of supervised technical devices.



**Fig. 25.** Distribution of casualties over 2001-2013 by the trauma factors



**Fig. 26.** Distribution of accidents over 2001-2013 by the federal districts of Russia



**Fig. 27.** Distribution of casualties over 2001-2013 by the federal districts of Russia

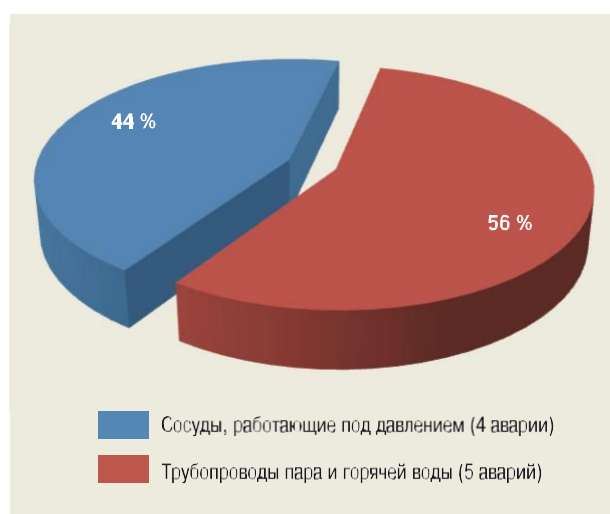


**Fig. 28.** Distribution of accidents over 2001-2013 by the types of technical devices

As it is demonstrated in figure 28, over 13 years of operation of steam and hot water pipelines there were fewer accidents (24% of the total amount).

Here it is necessary to note that 5 of 11 accidents during operation of steam and hot water pipelines happened during the latest 3 years (by 2 in 2011 and 2012, and 1 accident in 2013).

Increase of accident rate during operation of steam and hot water pipelines is related to the growth of amount of technical devices of this type with expired service life, thus, on January 1, 2011, the ratio of pipelines with expired design service life was 38 % (10,127 items), and on January 1, 2014, it was 41 % (13,325 items). In addition to obsolescence of technical devices, accident rate is also caused by reduction of staff number at supervised facilities and organizations, primarily, additional servicing personnel (for instance, line riders) and maintenance personnel (for instance, metalworkers of instrumentation and control tools and automatics).



**Fig. 29.** Distribution of accidents over 2011–2013 by the types of technical devices

Figure 29 demonstrates distribution of the accidents by the types of technical devices in the period of 2011-2013.

As the analysis of the reporting data shows, the value of the accident factor per 1,000 steam and hot water pipelines over 2011-2013 (0.156) is one fold higher than that of per 1,000 pressure vessels (0.013) over the same period. Over the 12 months in 2013 during operation of pressure equipment there were 3 accidents and 2 fatal accidents. The material damage caused by the accidents was over 11 million rubles.

Over the same period in 2012

2 accidents were registered with material losses over 31 million rubles, and 2 fatal accidents.

Accident rate in 2013 increased in comparison with 2012 by 33%. The number of fatal accidents at HIFs with pressure equipment did not reduce.

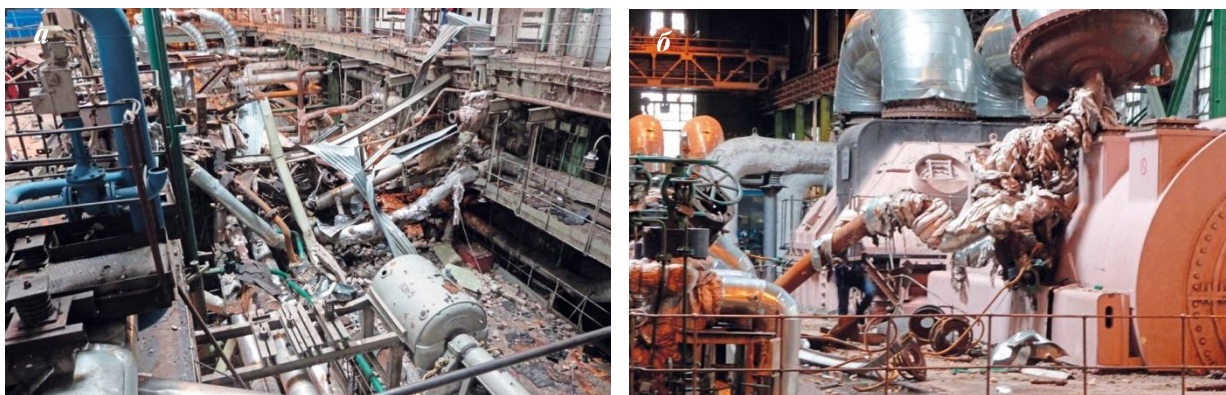
**On January 21 2013**, at the branch of PP Thermal Plant of Samara of JSC Volzhskaya TGK (town of Samara) there was a destruction of heating steam pipeline of Unit 2. It led to decrease of steam pressure in the high pressure deaerators and the follow-up disconnection of the feeding pumps and power boilers by protection systems of water level decrease in the tanks of the said boilers and disconnection of turbine generators in operation with the follow-up electric load drop of the entire plant (Figure 30). Nobody was injured.

The accident was caused by the fact that the steam pipeline elements had been produced with deviations from the requirements of the regulatory documents, and for a long period the pipeline had been in operation with latent defects.



**Figure 30, a, b.** The area of destruction of the heating steam pipeline of Unit 2 at the branch of Thermal Plant of Samara of JSC Volzhskaya TGK

**On October 2, 2013**, in branch of JSC INTERRAO-Elektrogeneratsia, Hydro Plant of Tcherepovetsk (town of Suvorov, Tula region), there was a damage of a high pressure heater (HPH) No. 7 caused by a break of the upper lid with the pipe system from the fastening of HPH No.7 as well as neighboring pipes with the follow-up partial destruction of the roof of 80 square meters over the turbine hall at HPH No. 7 of unit 2 (figure 31). Nobody was injured.



**Figure 31, a, b.** Types of consequences of accidents at HPH No. 7 in the turbine hall of unit 2 of the branch of JSC INTERRAO-Elektrogeneratsia, Hydro Plant of Tcherepovetsk

Causes of the accident:

- poor technical state of the HPH, availability of defects made in the course of repair (in the course of HPH repair, the connection of the steam distribution pipe was not repaired); a hydraulic stroke in the pipeline with the follow-up rupture of a steam supply distribution pipeline from the central pipeline of the steam supply in the body of HPH No. 7;
- issue by a specialized organization of an unjustified conclusion on possible follow-up operation of a technical device.

**On December 10, 2013**, at JSC NPO Iskra (town of Perm) there was a rupture of the base metal of the heat affected zone of a longitudinal welded joint of the delivery water heater (DWH) No. № 72420 of the steam boiler DKVR 10/13 of about 1,000 mm length. Nobody was injured.

Causes of the accident are being identified.



**On June 23, 2013**, during a cleaning (sludge flush) near by a slopping bottom of a boiler unit at JSC Archangelskiy TsBK (town of Archangelsk) performed by auxiliary operator of KTT, Mr. A.A. Khlyntsev, a block of sludge fell into the sludge bath, and it led to a break in the hydraulic lock. Then there was another fall of a block which led to release of hot sludge dust of the sludge bath into the work area, simultaneously Mr.A.A. Khlyntsev got severe burns and died in hospital.

There are the following causes of the accident:

- poor organization of works which resulted in non-fulfillment of manual cleaning of sludge bath without direct management and without informing the boiler house operator or the head of shift, this led to the fact that technical measures had not been taken to ensure safety of work (installation of appropriate furnace condition);
- personnel without appropriate training and certificates were allowed to work; poor production control.

**On July 19, 2013**, when examining hummer mill No. 4 of boiler unit BelKZ 75/39-100/13 of MUE Heating Networks of Olenegorsk (town of Olenegorsk, Murmansk region), there was of a flame-out from an operating boiler which was not completely cut off by gates from the work area. At the door of the mill there was mechanical technician R.G. Baruzdin and inspection engineer E.G. Havroshina who were seriously injured.

There are the following causes of the accident:

- violation of the regulation on equipment examination (one of the three butterfly valves on the dust pipe was not closed and it was connected with the coal dust burner of the boiler in operation);
- an employee who was not within the brigade defined by the work order and without a permit to maintain the boiler equipment was engaged into preparation of equipment for examination; unsatisfactory production control.

**On July 17, 2013**, as a result of a break in the wall tubes in the boiler furnace BKZ-210-140- 8 of branch "Primorskaya Generatcia" of JSC Far-Eastern Generating Company (town of Vladivostok) under the fuel nozzle with the release of steam and water mixture, operator of the boiler house control room, Mr. Yu.S. Bozhko got 80% burns on his body and died because of them in hospital.

Causes of the incident:

- destruction of wall tubes No. 22 and 25 of the fuel nozzle of the left boiler wall due to external low-temperature corrosion wear, which was generally on the surface of the wall tubes looking outside the boiler (figure 32);
- operation of a boiler with expired service life without its expert examination.

The industrial safety conditions of facilities where pressure equipment is used, is generally satisfactory at the supervised organizations.

Here it is necessary to note that there are technical, organizational and financial problems at the facilities which decrease the level of industrial safety assurance.

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**Figure 32, a, b.** The view of the area with the rupture of wall tubes under the fuel nozzle of the left wall of BKZ-210-140-8 boiler.

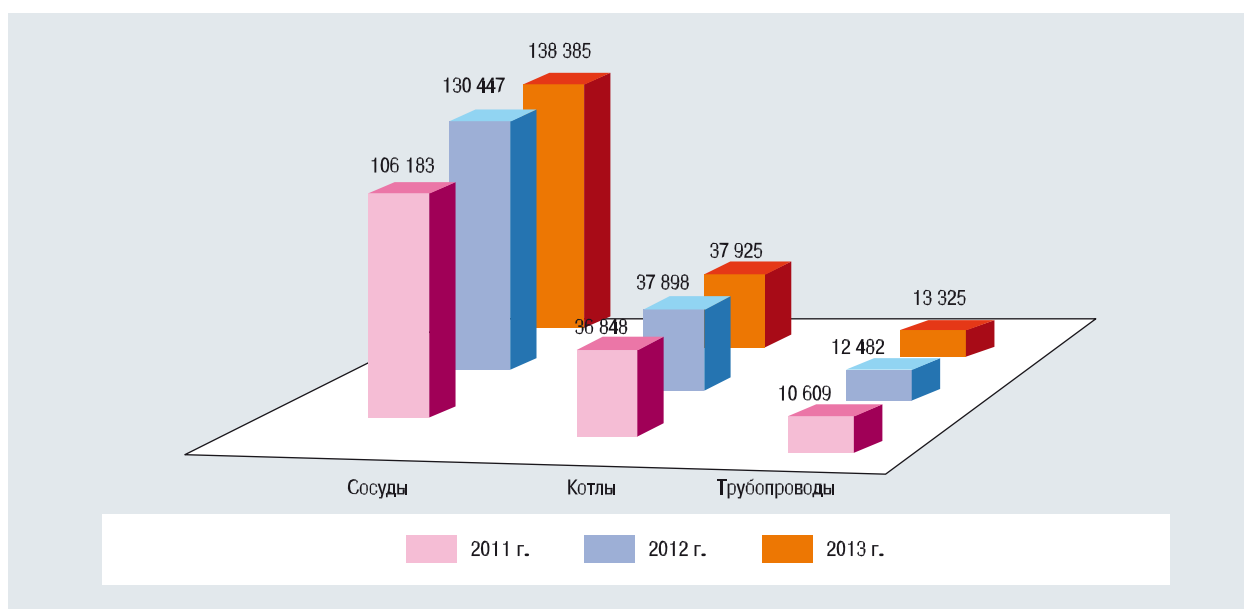
The major cause of decrease in the level of industrial safety is still a large amount of equipment with expired service life.

The information of average wear of technical devices as of 01.01.2014 is provided in the table 96 and figures 33-34.

**Table 96**

***The information of average wear of technical devices as of 01.01.2014***

<i>Name of technical devices</i>	<i>Total amount of technical devices, units</i>	<i>Expired service life, units</i>	<i>Average % of obsolescence</i>
Steam and hot water boilers	72,936	37,935	52
Pressure vessels	293,064	138,385	47
Steam and hot water pipelines	32,659	13,325	41
<b>Total:</b>	<b>398,659</b>	<b>189,645</b>	<b>48</b>



**Fig. 33.** The dynamics of number of technical devices with expired service life



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Rostekhnadzor Headquarters conducts continuous monitoring of work performed by specialized organizations which perform industrial safety reviews.



**Fig. 34.** The ratio of technical devices with expired service life by their type

Within 12 months of 2012, Rostekhnadzor Headquarters studied 256 industrial safety review reports, 243 of which were approved, and 13 were left without approval.

To ensure preparedness for localization and elimination of consequences of accidents at boiler supervision facilities, the supervised facilities plan and conduct measures to localize and eliminate consequences of accidents at HIFs.

Accident resistance of the supervised enterprises is ensured by a package of relevant organizational and technical measures:

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by the use of automated process control systems, continuous monitoring of hazardous substance content in the working area air, development of accident localization and elimination plans, emergency trainings, alerts for instruction, establishment of emergency response and rescue teams that are not on the regular staff at the facilities.

During the checks, the inspections of the condition of automated process control systems, fulfillment of emergency drills, their subjects, and completeness of the scope of involvement of operating personnel in emergency drills is subject to verification by the inspectors of the regional departments. Revealed violations are reflected in the Statements of checks and orders.

Assurance of safety and emergency resistance of the supervised enterprises is inseparably linked with the fulfillment by the supervised organizations of organizational measures for resistance to terrorist acts, the fulfillment of which is monitored by the state inspectors of the territorial bodies in the course of conducting examinations of supervised enterprises and organizations.

In 2013, the inspectors of the territorial bodies conducted 10,869 checks of the supervised organizations, 5,820 of which were scheduled and 5,049 - unscheduled. Average percentage of fulfillment of the annual work plan amounted to 99 %.

Over the same period in 2012 12,531 inspections were held at the supervised facilities, 6,010 of them were scheduled and 6,521 were unscheduled.

Average percentage of fulfillment of the annual work plan amounted to 99 %.

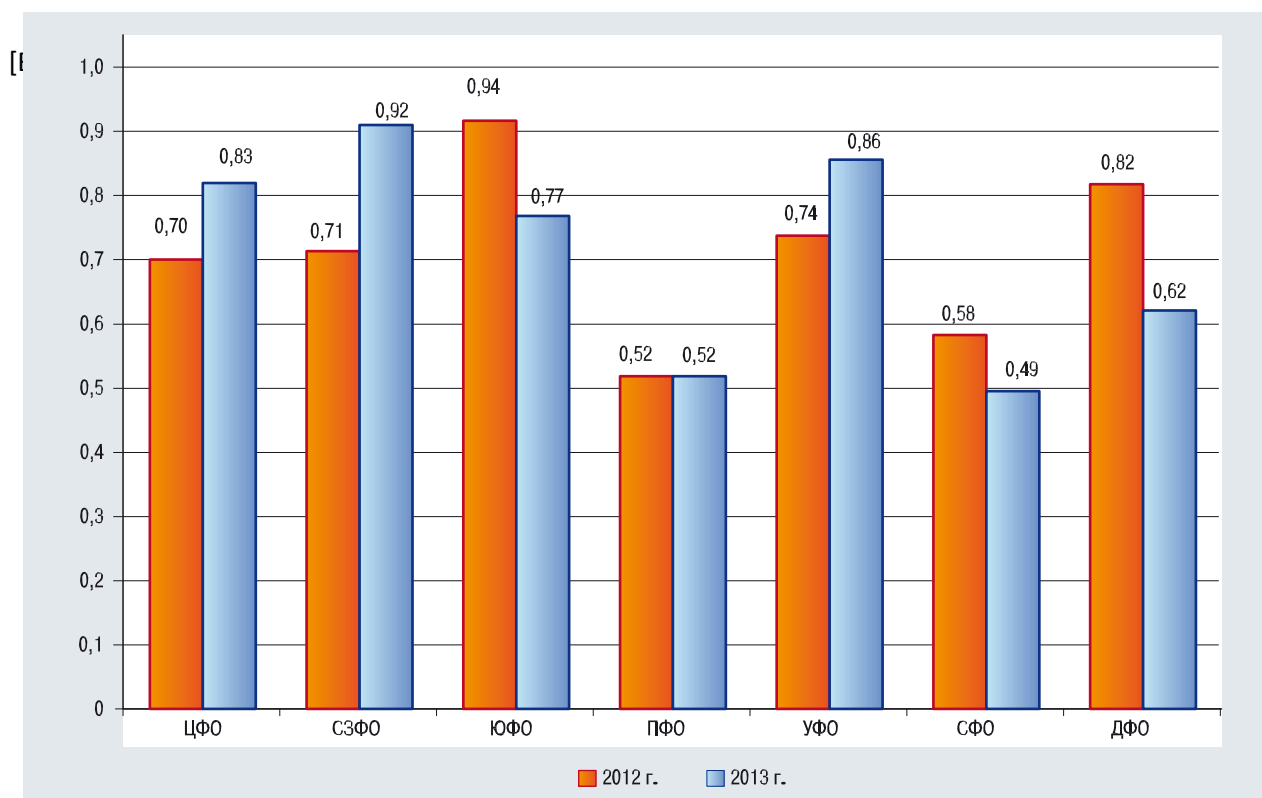
In comparison with 2012, the number of inspections held in 2013 reduced more than in 13%. It is explained by changes in the Russian legislation regarding the necessity in obtaining a license giving the right to operate an HIF of hazard class 4 which led to decrease in number of unscheduled inspections of whether the license applicants could comply with the license requirements.

The number of violations revealed in 2013 decreased in comparison with 2012 by almost 15% (in comparison with 2012, in 2013 inspectors of the regional departments during inspections at supervised organizations found 7,603 violations less). In addition, in comparison with 2012, in 2013 there was 14 % (32) less of administrative suspensions of activities based upon the results of inspections at the supervised facilities operating pressure equipment with severe violations of requirements of regulatory legal acts in the field of industrial safety.

In the course of checks, conducted in 2013, in 47 % of checked organizations violations of the regulatory document requirements in the area of industrial safety were revealed and orders for elimination thereof were issued with the indication of specific deadlines. 3,714 administrative penalties were imposed for the violations, of which: - administrative fines - 3,464 for the total sum of 150 million rubles (71 % of the total amount of fines imposed were collected); administrative suspension of activities was applied 204 times; disqualification was used only once; notices were issued in 44 cases.

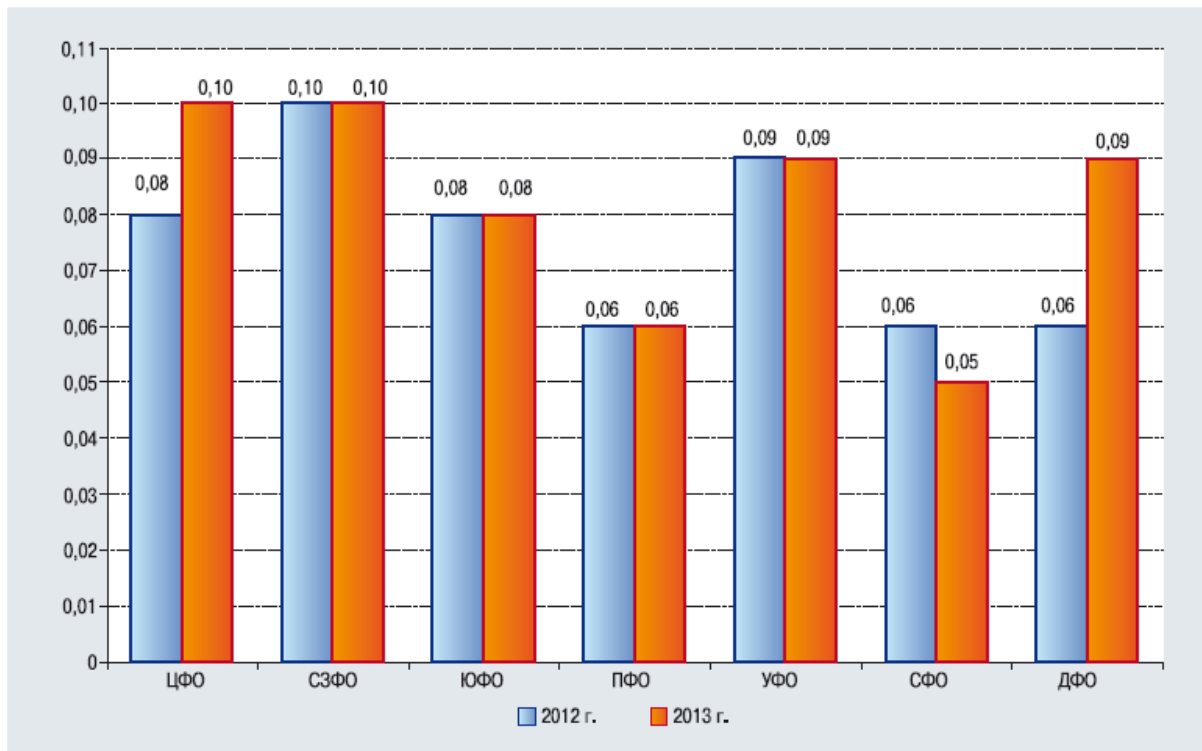
In 2012 4,031 administrative fines were imposed in the total amount of 173,898 thousand rubles. In comparison with 2012, the number of imposed fines in 2013 reduced to 14% (567). The average amount of fines per one inspection in 2013 reduced in comparison with 2012 (Figure 35), and slightly increased per 1 violation (Figure 36).

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**Fig. 35.** The average amount of fines per one inspection

In addition, in comparison with 2012, in 2013 there was 14 % (32) less of administrative suspensions of activities based upon the results of inspections at the supervised facilities operating pressure equipment with severe violations of requirements of regulatory legal acts in the field of industrial safety.



**Fig. 36.** The average amount of fines per one violation

Federal Law No. 22-FZ of March 4, 2013 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", some legislative acts of the Russian Federation and on invalidation of sub-item 114 of Article 333<sup>33</sup> of Part II of the Tax Code of the Russian Federation" introduced a classification of HIFs, forming of principles of risk-oriented supervision over compliance by the operating organizations of industrial safety requirements.

HIFs, where excessive pressure equipment is operated (hereinafter referred to as objects of boiler supervision) up to 1.6 MPa or under the temperature of the work medium not higher than 250 °C (except for facilities of heat supply to public and social facilities), are referred to hazard class 4. State supervision at such facilities is ensured by monitoring of information from the operating organizations without conducting scheduled inspections due to identification and referring the said facilities to ones with low level of accident occurrence during HIF operation.

Reduction of number of facilities referred to higher hazard classes of HIFs and in relation to which state control and supervision are envisaged in the form of scheduled inspections. Thus, according to the data of the regional departments of Rostekhnadzor, the results of re-registration of HIF with boilers supervision are as follows: 13,289 were qualified as hazard class 4, almost 26,874 of class 3 supply heat to public and social facilities or have got pressure equipment of 1,6 MPa and higher or with the temperature of work medium of 250 °C and higher, 3,772 and 1,373 facilities of classes 2 and 1 appropriately include facilities of boiler supervision.

To bring the legislative framework in line with the Russian legislation, Rostekhnadzor develops regulatory legal acts which establish obligatory requirements to assembling, operation, repair, upgrade, re-construction and decommissioning of excessive pressure equipment (steam and hot-water boilers, pressure vessels, steam and hot water pipelines, electrical boilers, etc.) to replace the Rules of Arrangement and Safe Operation of Appropriate Supervised Equipment which are to be invalidated in 2014.

With immediate participation of staff from Rostekhnadzor Headquarters the following regulatory legal acts were developed and are now at a high level of readiness:

The Federal codes and regulations in the field of industrial safety, the Rules of industrial safety assurance at HIFs where excessive pressure equipment is used;

The Federal codes and regulations in the field of industrial safety, the Requirements to welding at HIFs.

All the listed acts passed public discussions and assessment of their regulatory impact.

Federal codes and regulations in the field of industrial safety the Rules of industrial safety of hazardous industrial facilities with excessive pressure equipment have been sent for approval to the interested federal executive bodies, including the Ministry of Industry and Trade of Russia, Ministry of Internal Affairs, EMERCOM, Chief Department for Special Programs under the President of the Russian Federation, Federal Security Service, Federal Protection Service of Russia.

Rostekhnadzor Headquarters developed draft Government Decree "On Introduction of Changes into Government Decree No. 407 of May 13, 2013" regarding assigning authorities to Rostekhnadzor to control compliance with the requirements of technical regulations of the Customs Union "On Safety of Excessive Pressure Equipment" which was enacted on February 1, 2014.

Within the framework of preparation of the listed draft regulatory legal acts and implementation of programs of scientific research for justification and development of requirements to safety assurance of supervised facilities, as well as for implementation of priority areas of state control and supervision, employees of the Department of the State Civil Construction Supervision took part in the meetings of the Public Council of Rostekhnadzor and Unit No. 4 "Issues of Improvement of Boiler Supervision, Load-Lifting Structures Supervision and State Civil Construction Supervision" of the Scientific and Engineering Council of Rostekhnadzor on the topical issues and problems:

1. Problems of Rostekhnadzor in implementation its authorities due to changes in legislation on industrial safety.

2. Discussion of draft federal codes and regulations in the field of industrial safety, "The rules of industrial safety of hazardous industrial facilities, which use equipment operating under excess pressure."



3. Discussion of draft federal codes and regulations in the field of industrial safety, "Requirements to Welding at HIFs."

Representatives of regional departments of Rostekhnadzor presented their proposals and took active part in the meetings of Unit No. 4 of the Scientific and Engineering Council of Rostekhnadzor, together with representatives of Headquarters and largest services, units and organizations interested in industrial safety assurance at HIFs: FPS of Russia, NSL SRO, JSC NTTc PB, LLC Safety in Industry, JSC NIIHIMMASH, LLC NTP CENTRHIM-MASH, JSC PETROHIM INGININRING, JSC VNIINEFTMASH, JSC NTS DEB, JSC RZhD< JSC TKZ Krasniy Kotelschik, NP Rossijskoye Teplosnabzheniye, JSC MPNU Energotehmontazh, JSC Tetis Pro, Hyperbaric Medicine and Technologies Institute - Barocentr, JSC Machine Building Plant ZIO-Podolsk, INO Agency for Industrial Risk Research, JSC VTI, SertiNK FSAI NUCSK under the Bauman N.E. Moscow State Technical University, JSC NPP Mashtest, JSC NPO TsNIITMASH, MSTU after N.E. Bauman, All-Russian Non-Governmental Organization "Russian Scientific and Engineering Welding Society" (RSEWS), SRO NP NAPSP, NP NACPROMSVAR, MMAGS, SRO NP NAKS, JSC Gazprom, branch of JSC CNIIS NIC Mosty, NP National Industrial Welding Society, JSC NPF Engineering and Technological Service, JSC Mosenergo, etc.

Positive results of joint work were the ground for planning of meetings of the Public Council of Rostekhnadzor in 2014 on the topics related to operation of boiler supervision facilities, creating regulatory and legal framework for Rostekhnadzor to perform its functions in the conditions of changes in the industrial safety legislation.

To improve qualification level of inspectors and the level of control and supervision activity in compliance with 2013 Workshop Plans (meetings) approved by Decree No. 6 of January 14, 2013, of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia, the Department of Rostekhnadzor for State Civil Construction Supervision organized and held a workshop for deputy heads and heads of dedicated departments of regional offices of Rostekhnadzor on control and supervision of boiler supervision activities.

The workshop was held in the town of Khimki (Moscow Region) in the period of February 26 to March 1, 2013. It was timed to the 170th Anniversary of Boiler Equipment Supervision in Russia. Over 350 people took part in the event, among them there were 137 veterans of Boiler Equipment Supervision, and over 60 representatives of scientific research, educational organizations and institutions, the oldest plants manufacturing boiler equipment, and representatives of scientific and engineering society.

The speeches were made by the Chairman of Rostekhnadzor, N.G. Kutin, by Secretary of State Deputy Chairman of Rostekhnadzor, A.V. Ferapontov, and Deputy Chairman of Rostekhnadzor, B.A. Krasnykh.

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The following specialists were awarded for long standing work, high results in the professional work, irreproachable and effective state civil service and in connection with the celebration of 170th anniversary of Boiler Equipment Supervision:

- lapel badge "Honorable Worker" of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia - 1 employee;
- lapel badge "Honorable Inspector" of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia - 4 employees;
- medal after L.G. Melnikov of the Federal Environmental, Industrial and Nuclear Supervision Service - 4 employees;
- honorary certificate of the Federal Environmental, Industrial and Nuclear Supervision Service - 43 employees;
- 7 veterans of Rostekhnadzor and 7 representatives of scientific research institutions and organizations were also awarded to honorary certificates of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia.

Over 30 former employees of Rostekhnadzor took part in the technical workshop (currently those people are engaged into industrial safety) as well as 172 employees of the territorial departments of Rostekhnadzor. All the issues covered in the agenda of the workshop were covered at the lectures held by the employees of the Department for Civil Construction Supervision with engagement of employees of the Department for Organizational, Control and Licensing Activity of the Legal Department of Rostekhnadzor. Reports were given by representatives of the National Union of Civil Liability Insurers, JSC NTS PB, Bauman MSTU, N.E. JSC VTI, JSC SKTB BK, JSC NPO TsNIITMASH, VNIPTMASH, JSC NPO Specremenergo, GK Gorimpeks, LLC Elspert-Lift, JSC RATTE, LLC IC Centr-Profi, LLC NPP Raduk, JSC NPP Mashtest and specialists of other organizations.

#### *2.2.19. Facilities whereat Permanent Hoisting Mechanisms and Elevating Structures are Used*

In compliance with the authorities defined by the Provisions No. 401 on the Federal Environmental, Industrial and Nuclear Supervision Service of Russia, approved on July 30, 20014, Government Decree No. 407 of May 13, 2013, ""On authorized bodies of the Russian Federation for state control (supervision) of the implementation of the requirements of Technical Regulations of the Customs Union", Rostekhnadzor exercises state control (supervision), including the following:

- in the field of industrial safety at HIFs which consist of stationary load lifting mechanisms (except for elevators, lifting platforms for disabled persons), elevators in the subway, cable roads;
  - over compliance with the requirements of technical regulations of the Customs Union, "On Safety Assurance of Machines and Equipment" approved by decision No. 823 of the Commission of the Customs Union on October 18, 2011 (TR TS 010/2011); technical regulations of the Customs Union "Safety Assurance of Lifts" approved by decision No. 843 of the Commission of the Customs Union on October 18, 2011 (TR TS 011/2011);
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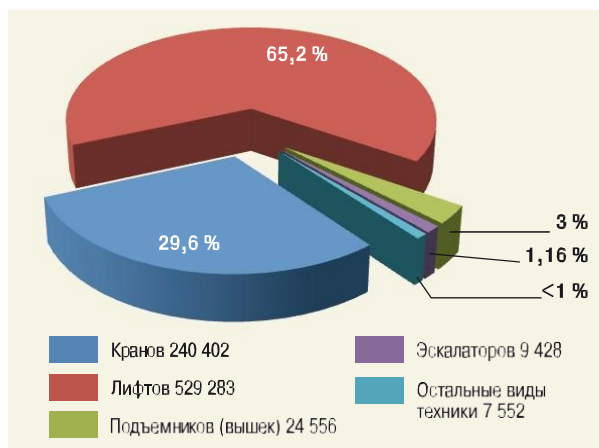
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- over compliance with the Rules of arrangement and safe operation of lifting platforms for disabled persons, approved by Decree No. 10 of Gosgortekhnadzor of Russia on March 11, 2001; the Rules of arrangement and safe operation elevators, approved by Decree No. 47 of Gosgortekhnadzor of Russia on August 2, 1994; during operation of floor-by-floor elevators, moving sidewalks on issues which do not contradict the requirements of the legislation in force.

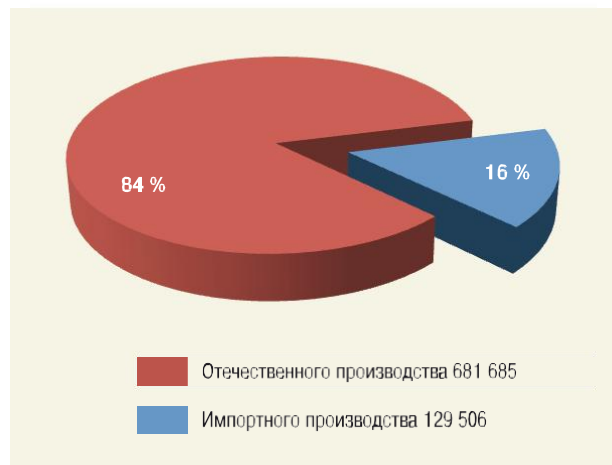
In addition to the measures of state control (supervision), continuous work is performed by the technical committees on standardization: SC 209

"Lifts, elevators, moving sidewalks, load lifting platform for disabled persons"; TK 289 "Load lifting cranes"; TK 438 "Elevators with working platforms"; TK 253 "Storage equipment."

Supervision over facilities with stationary load lifting mechanisms and lifting structures (hereinafter referred to as lifting structures) is exercised by 5 employees of Rostekhnadzor Headquarters and 519 inspectors of the regional departments of Rostekhnadzor. At 74,213 supervised facilities and organizations there are over 811 thousand lifting structures in operation (among them there are 240,402 load lifting cranes, 24,556 lifters (towers), 529,283 elevators, 140 overhead ropeways, 486 towing ropeways, 2 funiculars, 9,428 moving staircases and almost 6,900 cargo-passenger civil construction elevators and elevators for disabled persons) (Fig. 37).



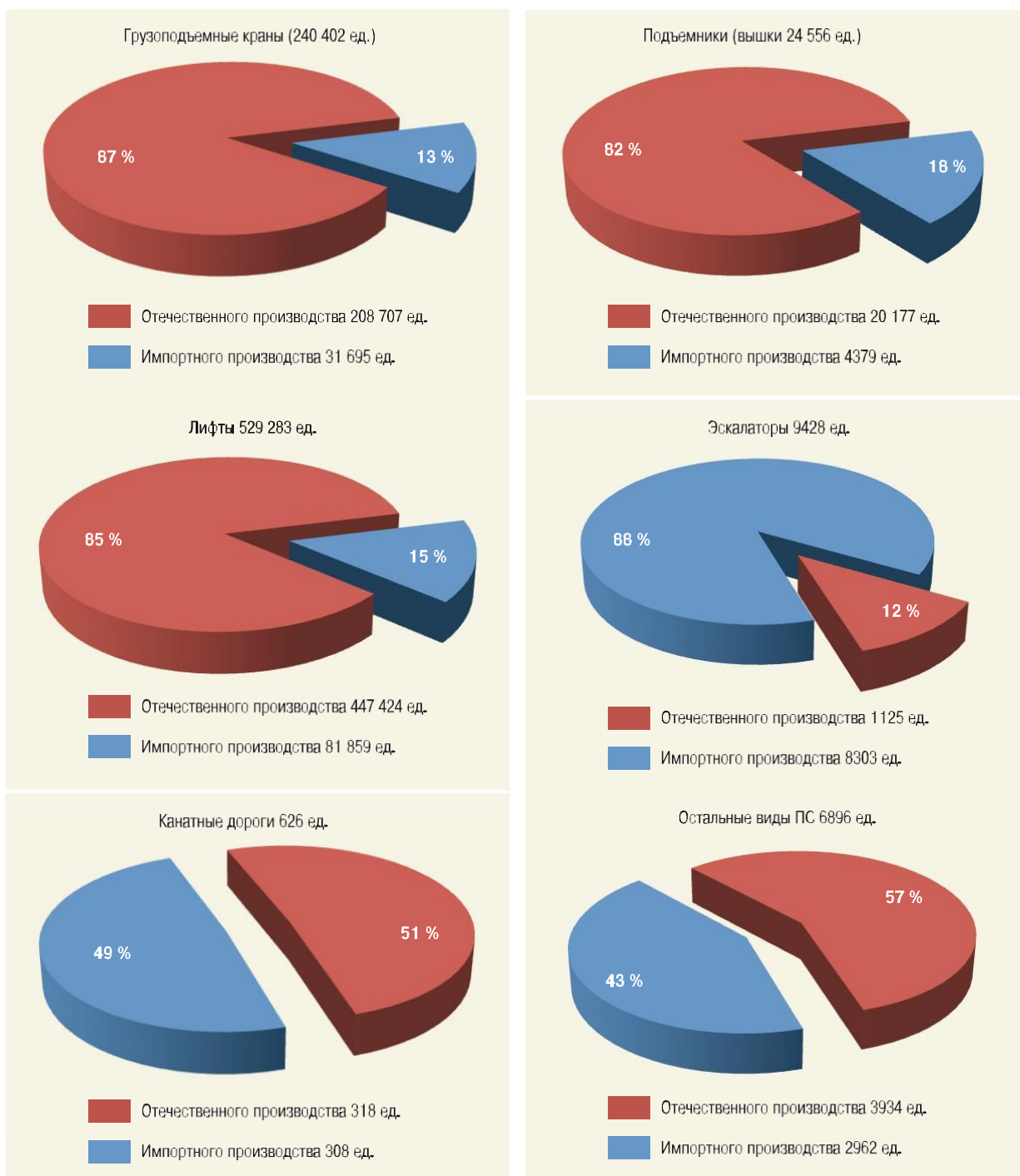
**Fig. 37.** Number of supervised technical devices (811,191 units total)



**Fig. 38.** The ratio of Russian and imported technical devices

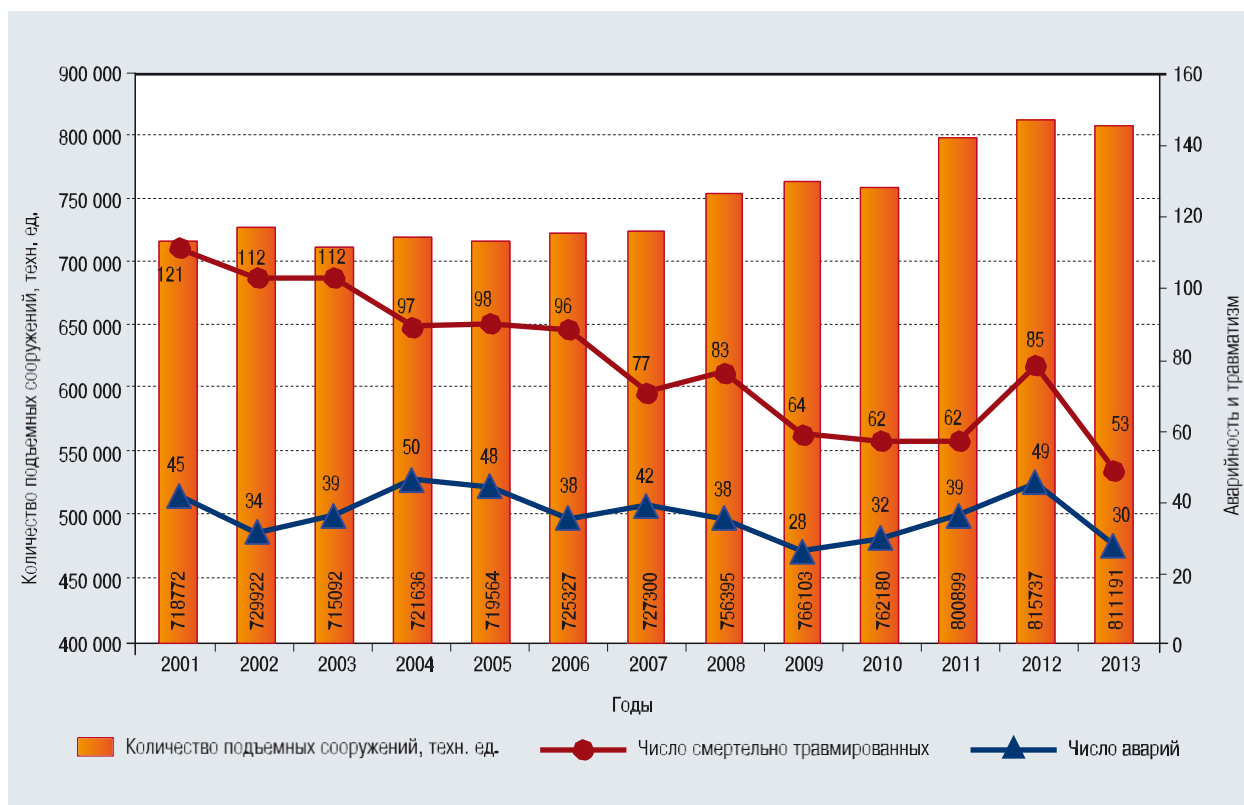
Due to international integration processes and decrease in production rates of the lifting manufacturing plants, in Russia almost 130 thousand units in operation are imported, i.e. 16% of the total amount of elevating structures registered by Rostekhnadzor (Fig. 38, 39).

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**Fig. 39.** The ratio of Russian and imported technical devices

It is necessary to note that accident factor for 1,000 imported cranes is 2 times higher than those of the Russian cranes, and it is 0.07.



**Fig. 40.** Dynamics of accident rates and fatal injuries during operation of lifting structures

Accident and fatal accident rates of lifting structures operation (Fig. 40) are impacted by the number of lifting structures in operation. In 2013 the number of loading structures decreased by over 45,000 units in comparison with 2012.

Until 2008 the crane fleet of Russia reduced with the speed of 5-10 thousand units per year, and in 2008 a 10 thousand unit increase of the crane fleet was registered, but it has started to reduce since 2009. However, the results of 2011 showed that the number of cranes increased in comparison with the data over 2010 - by 9,792 units, and in 2012 by another 2,049 units. The number of other types of loading mechanisms is also increasing. Thus, for instance, in 2013 the increase in crane fleet was 297 units in comparison with 2012, 61 units of overhead ropeways and towing ropeways, and 640 units of cargo-passenger civil construction elevators and elevators for disabled persons. Alongside, in 2013 the number of load lifting cranes decreased by 3,550 units in comparison with 2012, the escalator fleet (including moving sidewalks) reduced by 757 units, and that of lifts - by 1,236 units.

Reduction of the lift fleet is related to invalidation of regulatory acts with the provisions on the procedure of accounting and commissioning of lifts due to introduction of technical regulation of the Customs Union TR TS011/2011 "Safety of lifts", hence, the accounting of lifts was stopped. Rostekhnadzor has developed draft decree of the Government "On Approval of Provisions on the Commissioning Procedure and Accounting of Lifts", and currently the document is under legal and anti-corruption review held by the Ministry of Justice of Russia.



The information on the change in the total number of technical devices in 2013, in comparison with 2012 is presented in Table: 97.

**Table 97**

***The information on the change in the total number of technical devices  
in 2013 in comparison with 2012***

<i>Name of technical devices</i>	<i>Total quantity of technical devices in 2012</i>	<i>Total quantity of technical devices in 2013</i>	<i>Increase, % (units)</i>
Cranes	243,952	240,402	-1.5 % (-3,550
Hoisters (towers)	24,259	24,556	1.2 % (297 pieces)
Elevators	530,519	529,283	-0.2 % (-1236
Overhead ropeways	138	140	1.4 % (2 pieces)
Towing ropeways	427	486	13.8 % (59 pieces)
Funiculars	3	2	-33.3 % (-1 pieces)
Moving staircases	10,185	9,428	-7.4 % (-757 pieces)
Construction hoists	3,697	4,138	11.9 % (441
Hoisting platforms for disabled persons	2,557	2,756	7.8 % (199 pieces)
<b>Total:</b>	<b>815,737</b>	<b>811,191</b>	<b>-0.6 % (-4546 pieces)</b>

It is necessary to note that the level of industrial safety is influenced by technical, organizational and financial problems at supervised facilities.

The major cause of decrease in the level of industrial safety of lifting structures supervision is still a large amount of equipment with expired service life (Table 98).

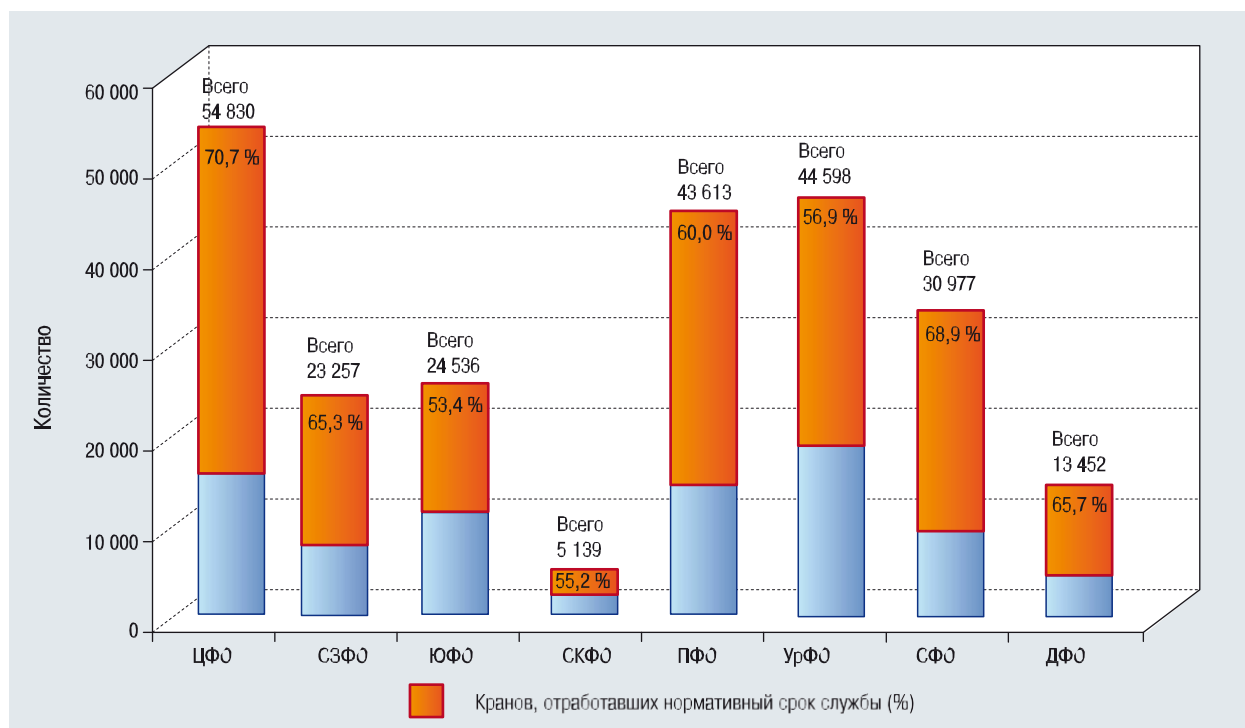
**Table 98**

***The information of average wear of technical devices as of 01.01.2014***

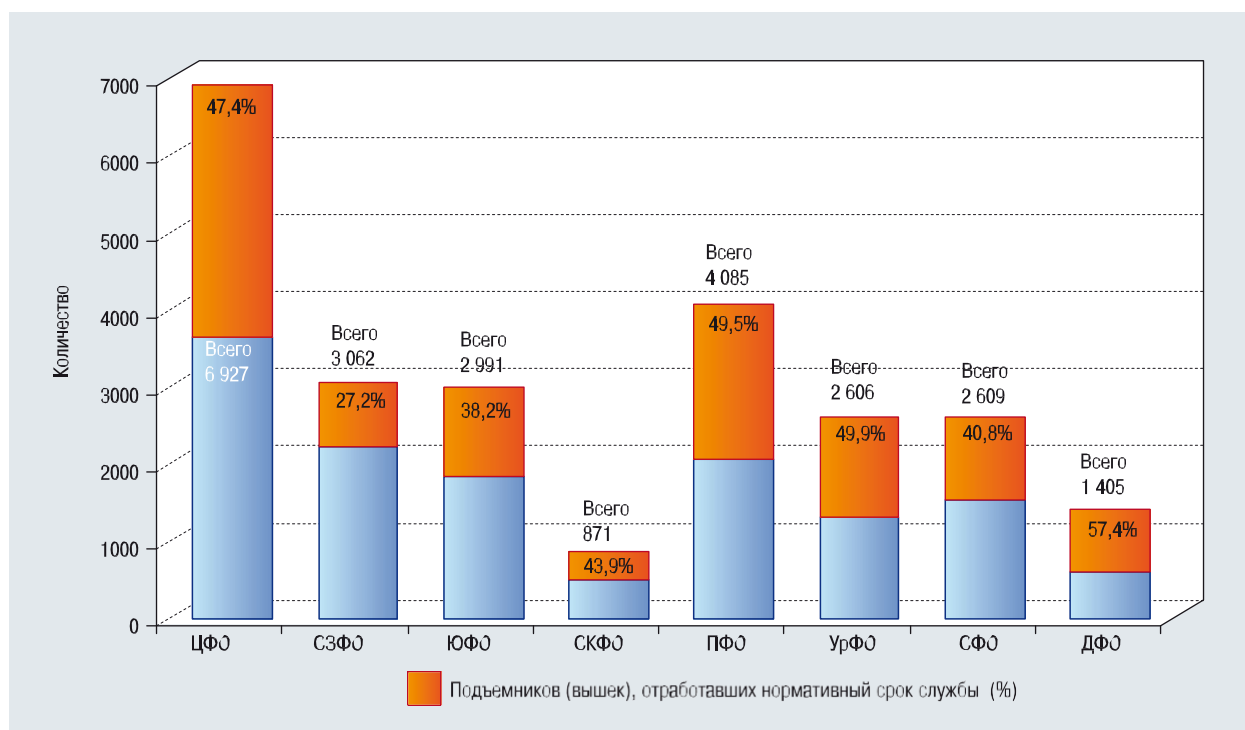
<i>Name of technical devices</i>	<i>Total amount of technical devices, units</i>	<i>Expired service life, units</i>	<i>Average % of obsolescence</i>
Load lifting cranes	240,402	154,239	64.2
Hoisters (towers)	24,556	10,836	44.1
Elevators	529,283	144,019	27.2
Overhead ropeways	140	42	30.0
Towing overhead ropeways	486	55	11.3
Funiculars	2	1	50.0
Moving staircases	9,428	77	0.8
Construction hoists	4,138	835	20.2
Load lifting platform for disabled persons	2,756	4	0.15
<b>Total:</b>	<b>811,191</b>	<b>310,108</b>	<b>38.2</b>

Average obsolescence of technical devices by the Federal Districts is demonstrated in Figures 41–44.

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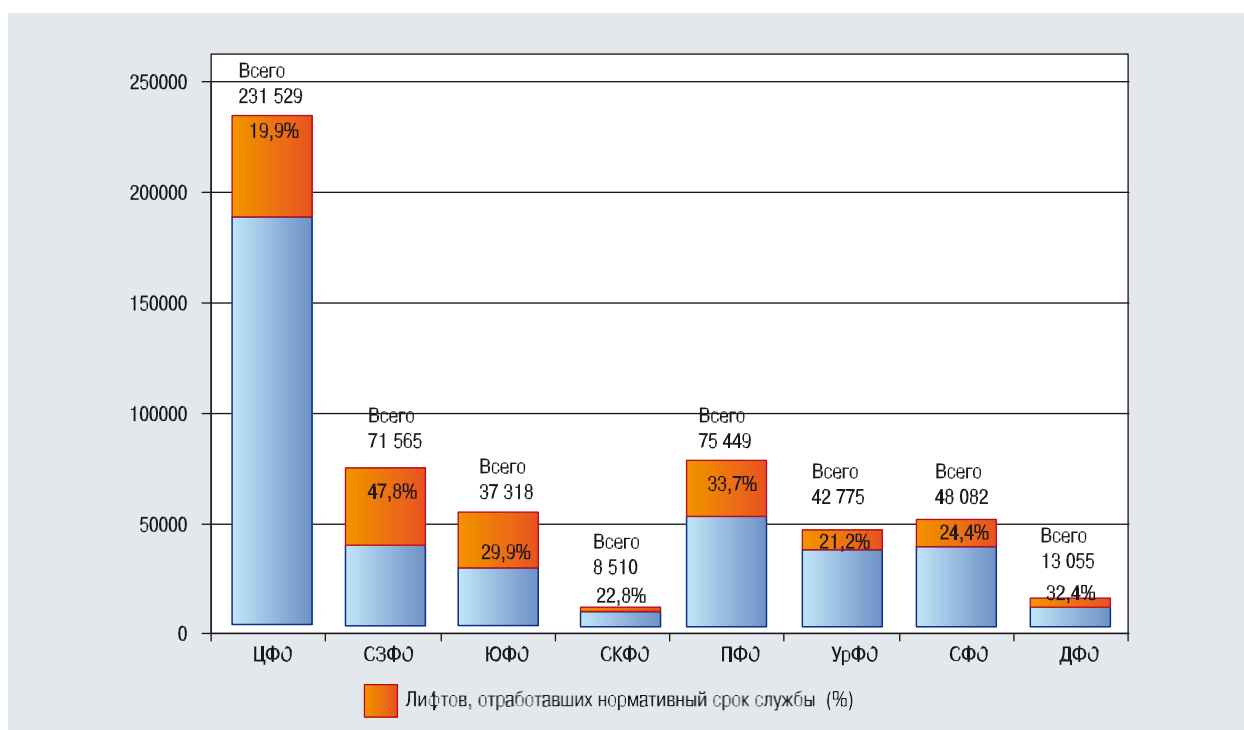


**Fig. 41.** The number of load lifting cranes with expired service life (in average, 64,2 % in Russia)

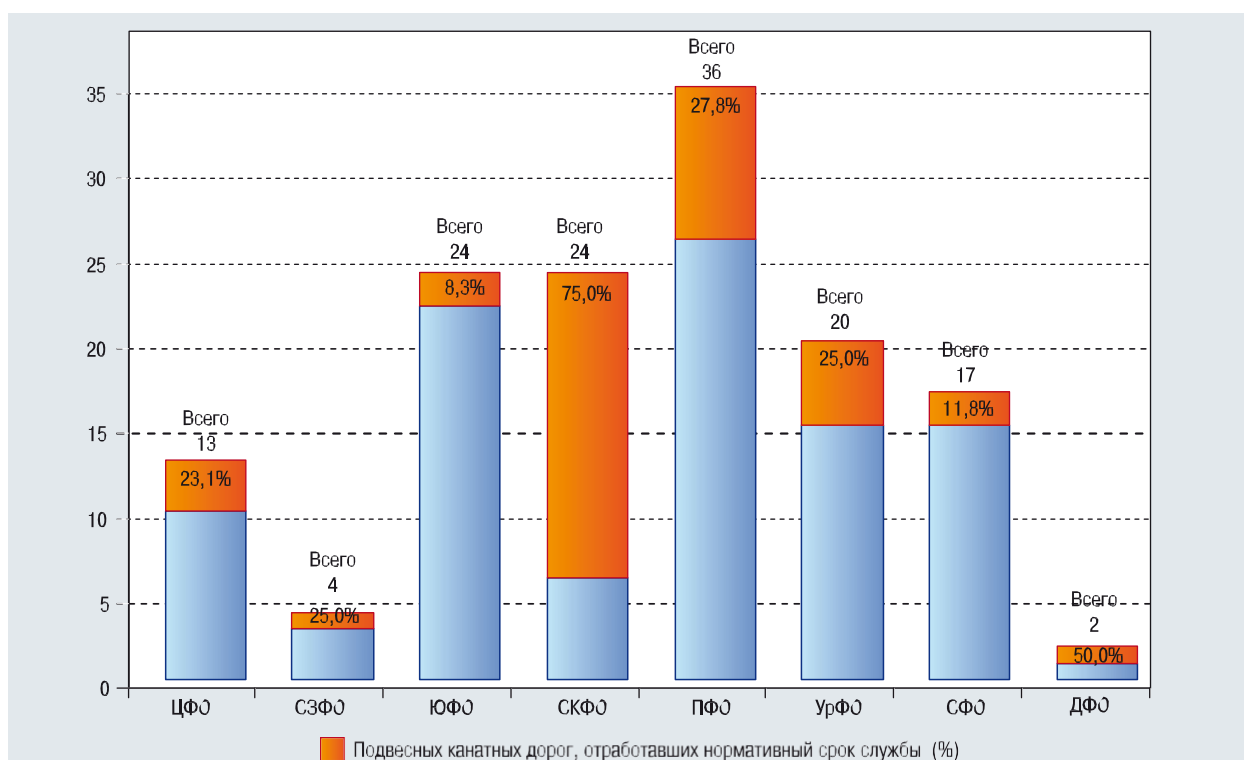


**Fig. 42.** The number of lifting cranes (towers) with expired service life (on the average, 44.1 % in Russia)

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**Fig. 43.** The number of lifts with expired service life (in average, 27,2 % in Russia)



**Fig. 44.** The number of overhead ropeways with expired service life (on the average, 30.0 % in Russia)

30 accidents occurred in 2013 at the enterprises, where hoisting structures are being operated, which is 18 accidents less than in 2012 (Fig. 45). The material damage caused by the accidents was about 80 million rubles (200 million rubles - in 2012).

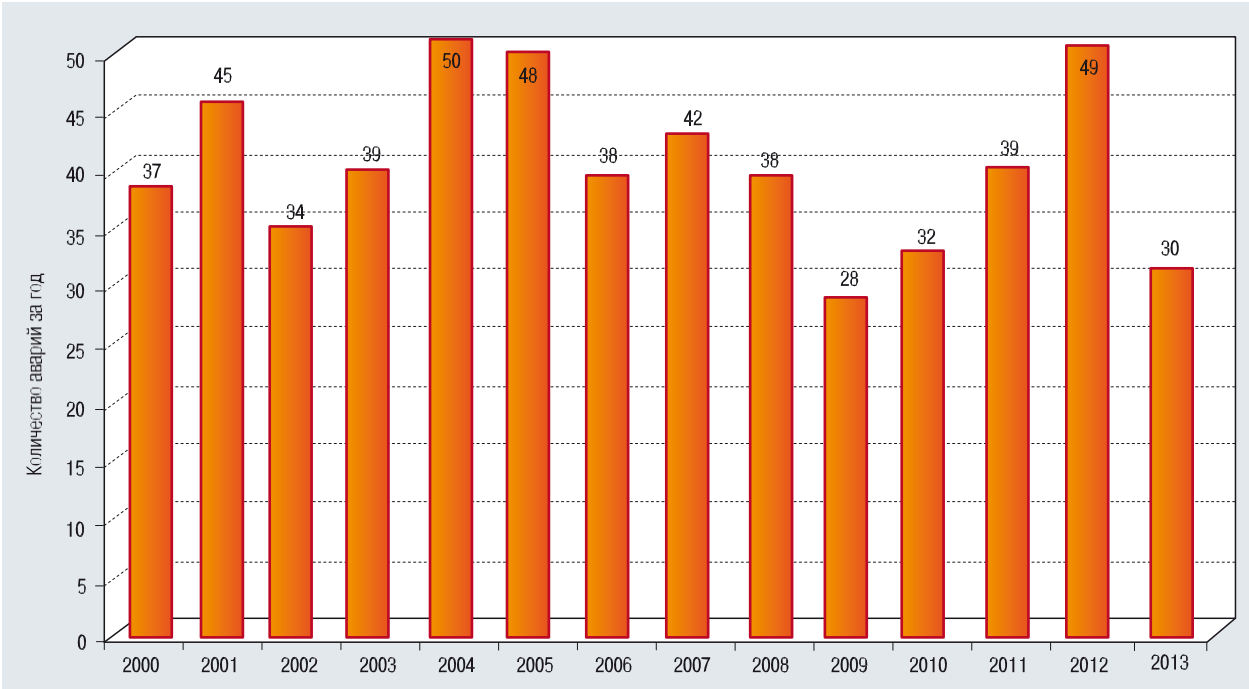


Fig. 45. Dynamics of accident rates during operation of lifting structures

In 20 of 30 accidents 24 persons were injured, including 12 fatal ones (in 2012 there were 58 and 30 persons fatally injured in 2012). 3 accidents resulted in group casualties.

Although the accident rate generally falls in Russia, it decreases in the West Urals Department (+2), Upper-Don (+1), North-Western (+1), North Caucasus (+1) and Middle Volga (+1) Departments of Rostekhnadzor. Accident rate decrease is detected in the Siberian (-6), Urals (-4), Low Volga (-3), Volga-Oka (-3), Far Eastern (-2), Interregional Technological (-1), Privolzhskiy (-1), Trans-Baikal (-1), Yenisey (-1), Sakhalin (-1) and Lena Departments (-1).

27 accidents of 20 (90 %) occurred during operation of load lifting cranes, 2 accidents (6.7 %) occurred during operation of elevators (towers), and one accident took place at an overhead passenger ropeway.

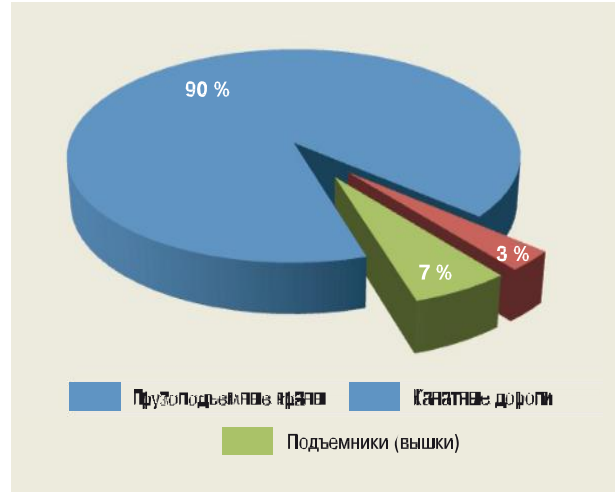


Fig. 46. Breakdown of accidents by the types of lifting structures

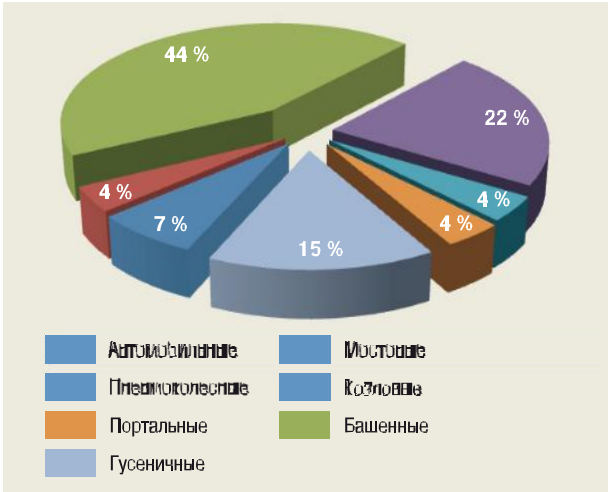


Fig. 47. Distribution of accidents by the types of load lifting cranes

The majority of accidents occurred during operation of tower cranes (44 % of the total amount of accident occurred with load lifting cranes), automatic (22 %) and caterpillar cranes (15 %) (Figure 47).

Two thirds of the accidents at hoisting structures was caused by technical reasons, primarily - by malfunction of technical devices or malfunction (absence) of safety instruments, the same number of accidents occurred due to ineffective production control. Violation of process and labor discipline, wrong or uncoordinated actions of the maintenance personnel and improper organization of work were among the main organizational causes of accidents.

*On February 21, 2013*, during repairing of sluices of hydraulic and structures and navigation in the Gorodets area (Nizhniy Novgorod Region) when an earthmover was moved down into the sluice cell with the help of automatic crane KS-55735-1, there was a turnover of the crane, so it fell together with the earthmover down on the bottom of the sluice cell (Fig. 48). Nobody was injured.



*Fig. 48.* KS-55735-1 moving down

Causes of the accident:

- operation with a damaged crane (with forcedly unplugged safety instruments);
- violation of Operation Manual of the Crane in the part of operating the crane with the working configuration of the lifting capacity limiter which does not meet the operating configuration of the crane, and without an additional counterpoise;
- poor organization of work which is manifested by admittance of responsible specialists and servicing personnel without appropriate certificates to work with the load lifting cranes and to perform construction and installation activities without a draft cranes operation process plan (OPP).

*On May 1, 2013*, crane SKAT-40 was retrieved from the pit at the capital construction object, "The 5th start-up complex of phase 1 of subway construction in the town of Samara from station Rossijskaya to station Alabinskaya." That work was performed simultaneously by two pneumatic cranes ST 2-2-40 (Nos. 5 and 32) owned by LLC Mechanization Department of Volgotransstroy (town of Samara).



Work on load lifting (metal structures of crane SKAT-40 of 12 t total weight) went normally until the mid of the pit. At that moment the ST 2-2-40 (No. 32) crane

*Fig. 49.* Downfall of the load on the bottom of the pit and turnover of cranes ST 2-2-40 on the upper layer of the pit bunton



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operator informed about serious overload of his crane.

The load of crane ST 2-2-40 (No. 5) seriously decreased. As a result of stopping of the load lifting by crane ST 2-2-40 (No. 32), there were dynamic loads and overloading of another crane, ST 2-2-40 (No. 5) which participated in load lifting. It led to vibration of arms of both ST 2-2-40 cranes, and then to the fall of the load on the bottom of the pit and to turnover of the cranes on the upper layer of the pit bunt. One of the crane operators was injured.

#### Causes of the accident:

lifting and transfer of the load by two cranes with no draft or process flow chart where there should have been schemes of strapping and moving the load with indication of sequence of the operations, positions of the load ropes; there should also have been instructions on safe transfer of the load, including those on admissible loads distribution per each crane participating in the lifting process, and the speed of load moving during the entire lifting process;

operation of damaged crane ST 2-2-40 (No. 32) expressed in forced cutoff (blocking) its load lifting capacity limiter, it led to overloading of the crane; violation of work production discipline by the operator of crane ST 2-2-40 (No. 32).

*a*



It should be noted that 10 % of accidents (3 accidents of 30) occurred under conditions of natural phenomena (hurricane, squall wind, heavy snow); however, in 2012 9 accidents with the same cause were registered (18 % of the total number of accidents in 2012), and in 2011 there were 4 accidents (10 % of the total number of accidents in 2011).

*On May 26, 2013*, at a project of construction of multistorey building (town of Kirov, Lenina str., 188/5) under a choppy wind, tower crane KB-408.21 (JSC Kirovo-Chepetskoye Construction Department, the town of Kirov) started moving by the railways in the direction of an apartment house nearby. Finally, the crane hit track buffer stops, demolished them and started falling in the direction of its movement. The tower and arm of the crane fell



*Fig. 50. Crash of tower crane KB-408.21 (JSC Kirovo-Chepetskoye Construction Department, the town of Kirov) started moving by the railways in the direction of an apartment house nearby. Finally, the crane hit track buffer stops, demolished them and started falling in the direction of its movement. The tower and arm of the crane fell*

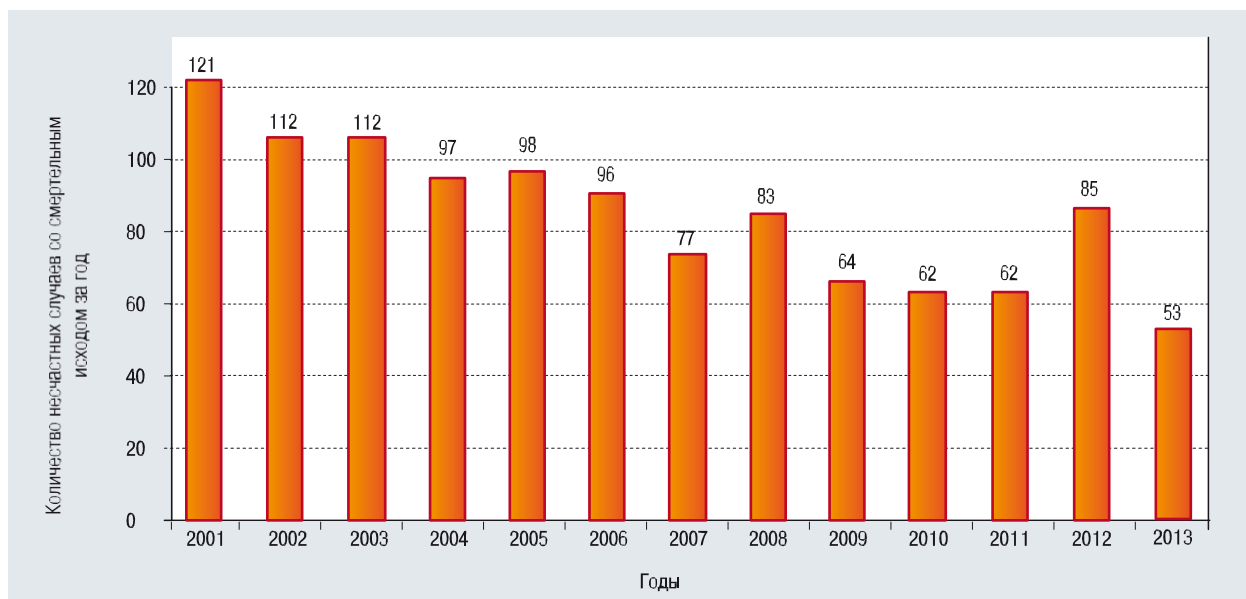
*a, b, — destruction of 8 balconies of the house;  
c — damage of cars parked nearby*

on the apartment house destroying 8 balconies and damaging cars parked nearby (Fig. 50). No victims because of the accident.

The accident was caused by force-majeure, i.e. wind load beyond the admissible level for a crane which is not in operation, in particularly, storm wind with 32 m/s speed which is 1.5 folds higher than the admissible level established by the manufacturer for such types of cranes.

In the year of 2013 there were 4 accidents occurred during operation of lifting mechanisms subject to registration by Rostekhnadzor departments but not registered there (all the accidents were taken off the register after investigations of their causes had been completed). 6 persons were injured by those accidents, and three of them were fatally injured. Thus, following the results of 2013, trauma factor (ratio of number of people injured in accidents and the number of accidents) in accidents caused by devices not registered by Rostekhnadzor was 1.5. It is significantly higher than trauma rates of accidents on lifting structures properly registered by Rostekhnadzor, it is 0.8. It is necessary to note that in 2012 there were 12 registered accidents which occurred during operation of unregistered lifting structures. 11 people were injured in 6 accidents, 7 of them got fatal injuries. In the year of 2011 there were 3 accidents, 12 people got injured and 8 of them were fatally injured.

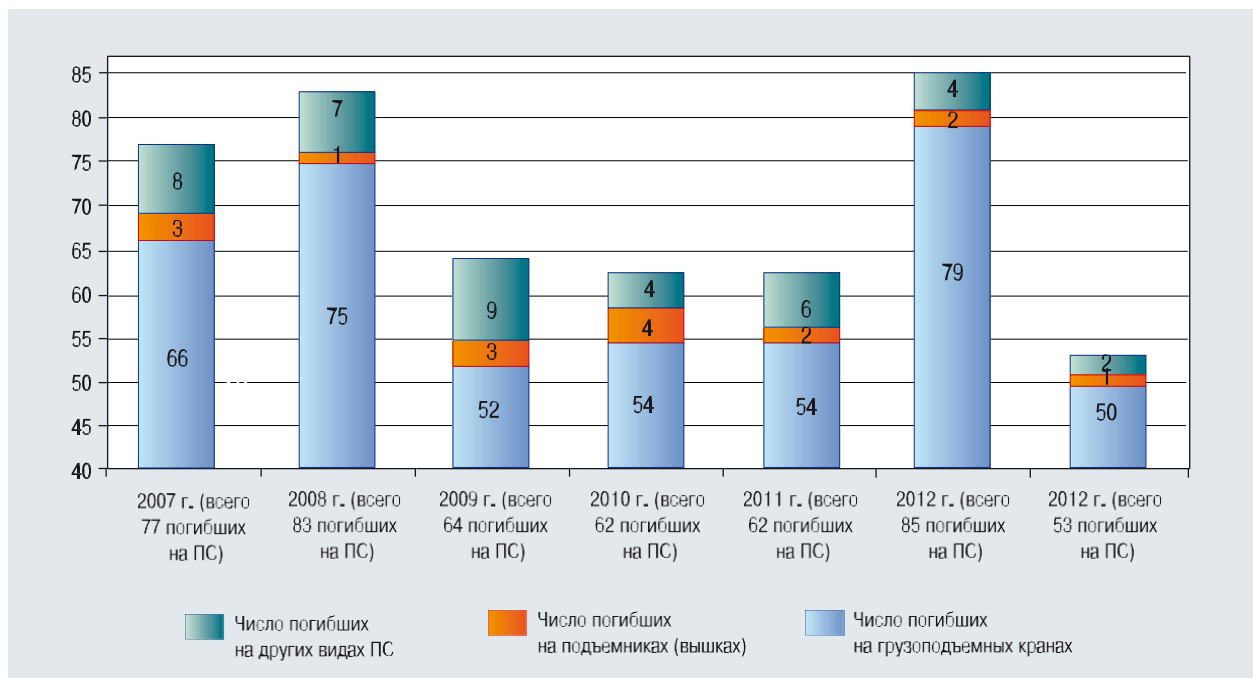
In the year of 2013 53 persons were fatally injured during operation of lifting structures (Fig. 51).



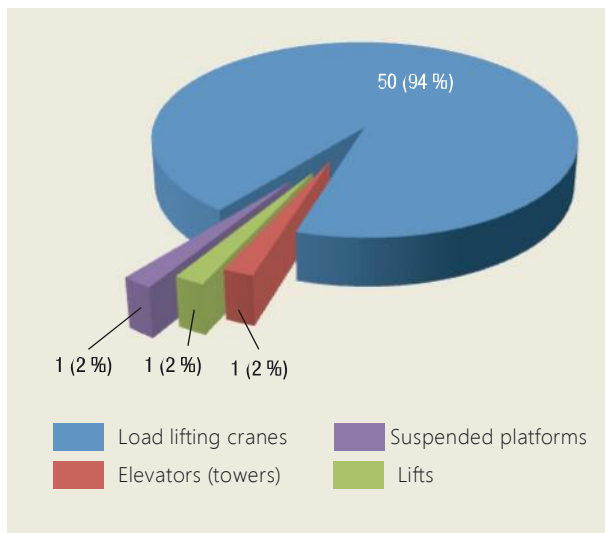
**Fig. 51.** Dynamics of fatal injuries during operation of lifting structures

50 fatalities of 53 (94%) occurred during operation of load lifting cranes, and by 1 accident (2%) occurred during operation of lifts, suspended platforms and auto lifts (towers).

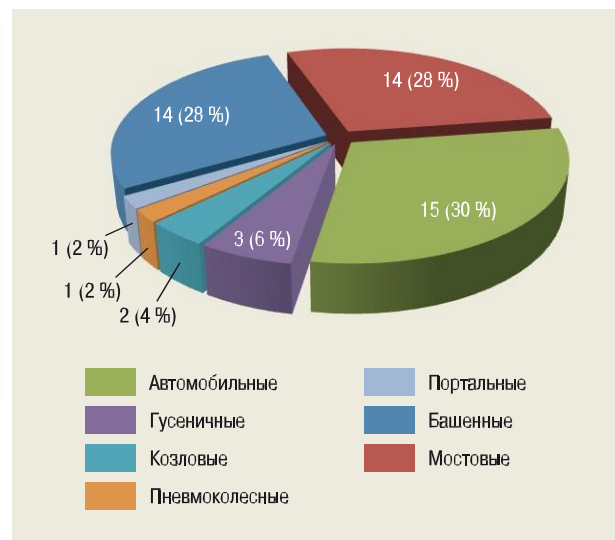
The analysis of the casualties occurred during operation of the erecting cranes allows us to conclude that the injury rates remained high during operation of truck cranes (30% of the total number of casualties occurred at the cranes), bridge cranes (28 %) and tower cranes (28 %) (Fig.52-54).



**Fig. 52.** Distribution of fatal accidents by the types of lifting structures



**Fig. 53.** Distribution of fatal accidents by the types of lifting structures



**Fig. 54.** Distribution of fatal accidents by the types of load lifting cranes (totally 50 lifting structures 53)

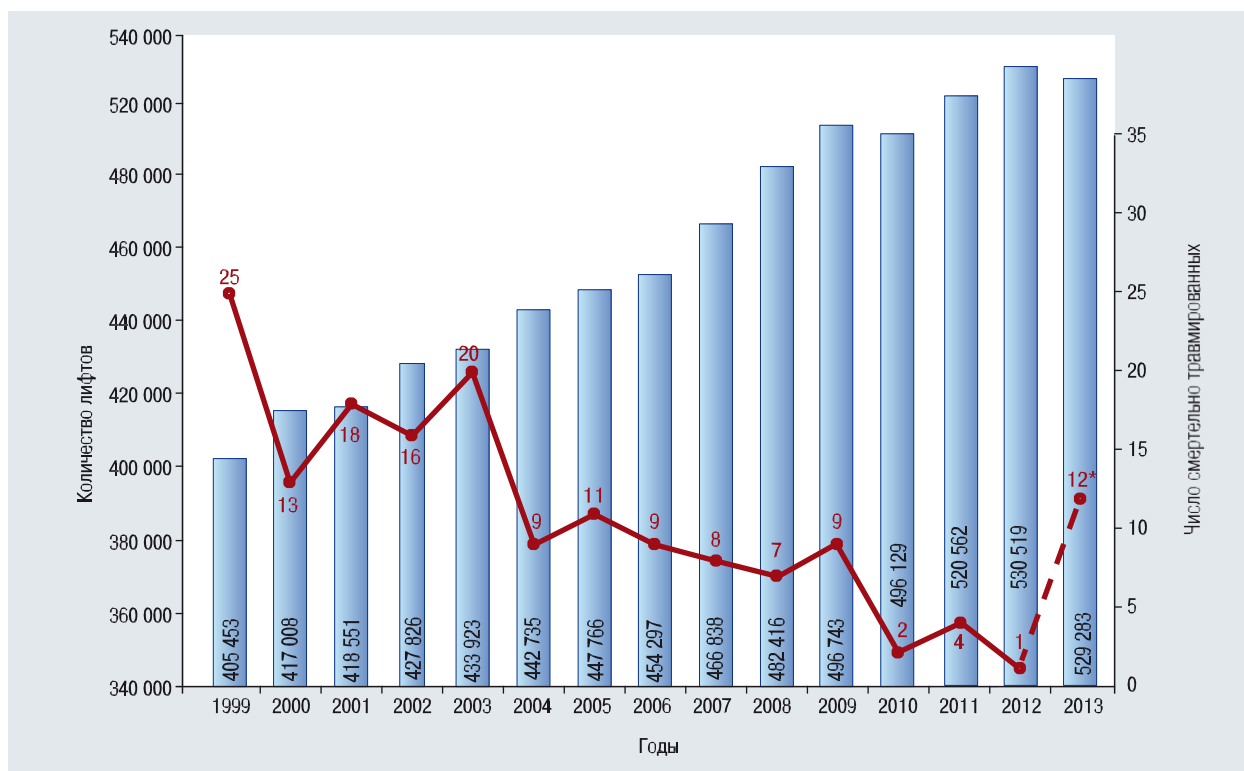
Although there was serious reduction in the number of accidents in 2013, fatal injury rate grows in the West-Urals (+4), Yenisey (+3), North-Urals (+2) and Pechora (+1) Departments of Rostekhnadzor. Fatal injury rate decreases in the Urals (−10), Central (−8), Siberian (−8), Far Eastern (−3), Interregional Technological (−2), North-Western (−2), Volga (−2), Upper Don (−1), Priokskiy (−1), Low Volga (−1), Caucasus (−1), Mid Volga (−1), Trans-Baikal (−1), and Sakhalin Departments (−1).

It is necessary to note that in 2013 when lifts were excluded from the HIF category, Rostekhnadzor did not make any arrangements related to accounting and

investigation of causes of accidents and casualties occurred during operation of lifts.

The state control (supervision) over compliance with the requirements of the Technical Regulations of the Customs Union "Safety of Lifts" in relation to lifts and their safety devices is performed in compliance with Government Decree No. 407 of May 13, 2013. However, the Technical Regulations of Customs Union approved by Decision No. 824 of the Commission of the Customs Union on October 18, 2011, does not specify requirements to the procedure of investigation of accidents and casualties during operation of lifts.

Rostekhnadzor developed draft Government Decree "On approval of procedures for investigating causes and circumstances of accidents at hazardous facilities - lifts, load lifting platform for disabled persons, escalators (except for those in the subway)" which is under the approval procedure now.



*Fig. 55. Dynamics of fatal injuries during operation of lifts*

Alongside, according to the data of the Unified Lift Information and Analytical System (ELIAS NLS), the source of which is publicly available information from the media in Russia, in 2013 39 people got injured during operation of lifts, 12 of them died (12\* in Fig. 55). More than a half of accidents occurred in passenger elevators installed in apartment houses. Accidents occurred in Moscow, Saint Petersburg, Bijsk, Volgograd, Vorkuta, Gaj, Irkutsk, Kaliningrad, Novotroitsk, Orel, Penza, Perm, Petrozavodsk, Samara, Chelyabinsk, Tchekhov.

It is necessary to note that in 2013 there were registered several cases when information about accidents and severe casualties at HIF was not timely sent to the regional department of Rostekhnadzor, but was published by the media.

Thus, for example, information about a severe casualty was published by the media. The accident occurred in December 2012 with a woman living in Smolensk on the towing ropeway of club Semigorye. When clarifying the data, it turned out



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that the ropeway had been in operation for over 30 years, although, Rostekhnadzor had no information about it.

The number of group accidents decreased from 19 to 9. 24 persons were injured in group accidents in 2013, including 6 fatal ones (in 2012 there were 53 and 24 persons appropriately).

**On February 28, 2013**, when sawing trees in Krasnoarmejskaya street of the town of Novocherkassk, autohydraulic hoist VS-22 was applied but it was not registered by Rostekhnadzor (its owner was IE Vasiliev M.K.), the hanging stage with 2 people fell on the roof of one-storey building. As a result, one worker got severe injuries, and the second one died.



**Fig. 56.** Fall of the hanging stage of autohydraulic hoist VS-22 on the roof of the one-storey building: *a* — drawing of the accident; *b* — the area where the bracket torn of the fastening of the hydraulic cylinder

The causes of the accident and the group accident was because the plate of hydraulic cylinder tore off the fastening due to destruction of a welded joint made during repair to fasten the plate to the metal structure of the lower bent of

the arm (availability of pores, lack of fusion alongside the welded joint); operation of a failed elevator which was not registered by Rostekhnadzor, had expired service life and was not subject to expert examination; poor production control and technical maintenance, absence of passport and repair documentation as well as qualified personnel.

**On March 11, 2013**, a group accident occurred on construction site of a complex of oil refinery and petrochemical plants JSC Tat-neft in the town of Nizhnekamsk. When moving a pipe of 11 m length with the help of automatic crane Liebherr LTM 1160-5/1, the pipe fell and one of the beams of a metal structure under construction was damaged, it fell on the catwalk bridge (Fig. 57) where there were 2 assembly workers of LLC Dvigatelmontazh-NK. When the assembly workers fell from the height of 21 m, one of them died, another got serious injuries.

The causes of the group accident were violations of the technological process (transfer of the pipes without belt idlers and electric winches as stated in the work

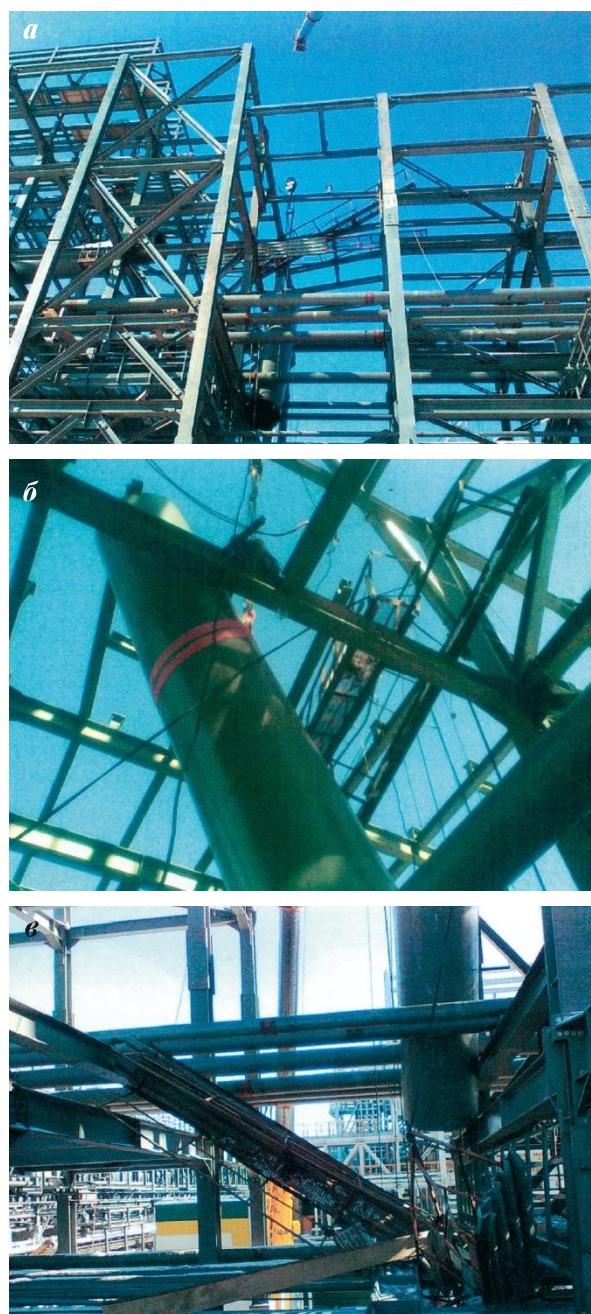


procedure plan, violation of the schemes of slinging large scale and long sized loads; the works on assembly of the pipeline in the area where fastening of basic beams had not been completed); poor organization of works (absence of a person responsible for safe work by cranes for which there were no schemes of slinging, access to slinging for non-trained and unqualified employees, assembly of the pipeline with the use of appendix to the work procedure plan which had not passed industrial safety review, violation of position and work production instructions).

*On April 19, 2013*, town of Surgut, the operator of tower crane POTAIN- MDT-178 (owned by JSC Zapsibinterstroy) independently started repairing a malfunction of the crane without informing the engineering specialist who was responsible for its operable condition, and without registering it in the logbook. Besides, he committed depressurization of the hydraulic equipment and a leak of hydraulic oil from the hydraulic system due to connection of the screwed connection of the high pressure and the adapter (connecting pipe). As the section where the crane operator was at that moment, was not fixed by the assembly pin and was only held by the hydraulic cylinder, when the system was depressurized, the assembly section started moving down from the height of

the 17<sup>th</sup> floor by roll guides. At the level of the 12th floor the falling assembly section hit the anchoring of the crane to the building, and stopped. During the crash, the crane operator who was not fastened to the crane structures by his assembly belt fell on the ground getting a fatal trauma. At the same moment two workers who were going up by the crane stairs could not keep standing due to the hit and fell down from about 4 m height. They got traumas of different severity.

Causes of the accident and the group accident: unauthorized interference of the crane operator into the hydraulic equipment system of the crane during examination

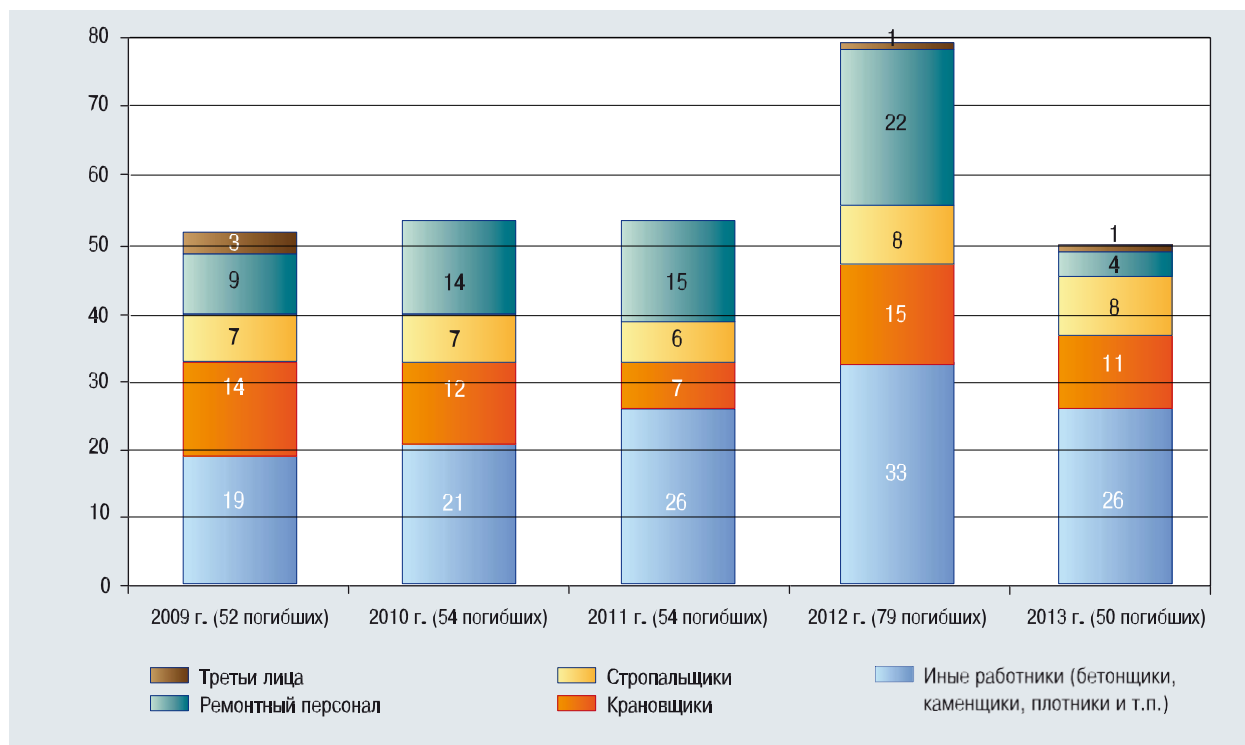


*Fig. 57, a–c.* Types of metal structures used in construction of a complex of plants of JSC Tatneft on which site there was the group accident.

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before the start of work; violation of the production instruction; unsatisfactory supervision over safe operation of load lifting cranes at JSC Zapsibinterstroy; poor organization of works and production control.

Almost 90 % of fatal accidents were caused by organizational matters, generally, by ineffectiveness of production control and wrong production process organization. The major technical cause of fatal traumas at lifting structures is poor condition of technical devices, tools and safety instruments.



**Fig. 58.** Categories of employees killed in accidents with lifting cranes in operation

The statistics show that the major death rate is among the employees who are not directly involved into load lifting cranes operation, i.e. repair personnel, concrete workers, carpenters, masons, welders, etc. (Fig. 58).

The analysis of causes of traumas at lifting structures also showed that 2 employees who had died during operation of load lifting structures (4% of the total number of deaths) were drunk.

Notwithstanding the indicator has a tendency to decline (in 2012 there were 7 % fatally injured who were drunk, in 2011 - 13 %, and in 2010 17 %), as a rule, work admission of drunk personnel leads to serious consequences.

**On April 24, 2013**, at an apartment house construction site in the town of Novosibirsk, tower crane QTZ-80 crashed when lifting two packs of fittings of overall weight of 9 t (JSC Bashkran). As a result, the crane operator was seriously injured (Fig. 59).

Causes of the accident: operation of the tower crane with an inoperable load limiter, so this led to 190% overloading;



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poor organization of work process and inefficient production control which was expressed in work admission for personnel without training and qualification, and in the fact that the operator who died, was drunk.

2013 resulted in average trauma rate per 1,000 cranes of 0.208 (Fig. 60).

It is necessary to note (Table 99) that in the Interregional Technological, Pechora, Lower Volga, West-Urals, Volga, Volga-Oka,



**Fig. 59.** Fall of a crane on construction site of an apartment house in Novosibirsk: *a* — general view of tower crane QTZ-80; *b, c* — damaging cars parked near by

Yenisey, Far Eastern and Lena Departments of Rostekhnadzor fatal trauma rate per 1,000 cranes is generally higher of the average factor in Russia in 2013, which is 0.208. The highest fatal trauma rate per 1,000 cranes is registered in the Volga Department of Rostekhnadzor, it is 0.321. In 2013 in this regional department there were 4 fatal accidents, however, there are 7,678 load lifting cranes registered there.

**Table 99**

***The fatal accident factor per 1,000 cranes  
(it is 0.208 on the average in Russia)***

	<i>Number of load lifting cranes</i>	<i>Fatalities</i>		<i>Trauma rate per 1000 cranes</i>
		<i>Total on</i>	<i>Among them</i>	
<i>Central Federal District</i>	54,830	8	7	0.128
Interregional Technical Department	12,326	5	4	0.324
Central Department	18,007	3	3	0.167

	<i>Number of load lifting cranes</i>	<i>Fatalities</i>		<i>Trauma rate per 1000 cranes</i>
		<i>Total on lifting structures</i>	<i>Out of them, cranes</i>	
<b><i>North-Western Federal District</i></b>	<b><i>23,257</i></b>	<b><i>4</i></b>	<b><i>4</i></b>	<b><i>0.172</i></b>
North-Western Department	19,559	3	3	0.153
Pechora Department	3,698	1	1	0.270
<b><i>North-Caucasus Federal District</i></b>	<b><i>5139</i></b>	<b><i>1</i></b>	<b><i>1</i></b>	<b><i>0.195</i></b>
Caucasus Department	5139	1	1	0.195
<b><i>Southern Federal District</i></b>	<b><i>24,536</i></b>	<b><i>7</i></b>	<b><i>6</i></b>	<b><i>0.244</i></b>
Northern Caucasus Department	12,807	3	2	0.156
Lower Volga Department	11,729	4	4	0.341
<b><i>Volga Federal District</i></b>	<b><i>43,613</i></b>	<b><i>1</i></b>	<b><i>14</i></b>	<b><i>0.321</i></b>
Western Urals Department	21,365	7	6	0.281
Volga Department	7,678	4	4	0.521
Middle Volga Department	7,667	1	1	0.130
Volga-Oka Department	6,903	3	3	0.435
<b><i>Urals Federal District</i></b>	<b><i>44,598</i></b>	<b><i>8</i></b>	<b><i>8</i></b>	<b><i>0.179</i></b>
North-Ural Department	19,864	3	3	0.151
Urals Department	24,734	5	5	0.202
<b><i>Siberian Federal District</i></b>	<b><i>30,977</i></b>	<b><i>5</i></b>	<b><i>5</i></b>	<b><i>0.161</i></b>
Siberian Department	18,506	1	1	0.054
Yenisei Department	9,721	4	4	0.411
<b><i>Far Eastern Federal District</i></b>	<b><i>13,452</i></b>	<b><i>5</i></b>	<b><i>5</i></b>	<b><i>0.372</i></b>
Far-Eastern Department	8,260	4	4	0.484
Lena Department	2,894	1	1	0.345
<b><i>Total:</i></b>	<b><i>240,402</i></b>	<b><i>5</i></b>	<b><i>50</i></b>	<b><i>0.208</i></b>

*Note.* The table only indicates regional departments with accidents occurred during operation of load lifting cranes.

The comparative analysis of major work indicators of Rostekhnadzor regional departments in 2012–2013 shows that the number of supervised organizations sharply reduced in 2013 in comparison with 2012 (in 2012 the total amount of supervised organizations was 83,921, and in 2013 it was 74,213).

In 2013, the inspectors of the territorial bodies conducted 20,469 checks of the supervised organizations that operate hoisting structures; 12,454 of them were scheduled and 8,015 unscheduled ones. The percentage of fulfillment of the annual work plan amounted to 98 %. In comparison with 2012, the number of inspection in 2013 reduced down to 17 %.

It is necessary to note that in compliance with item 7 of the Rules for preparation of the state control (supervision) authorities and municipal control authorities of annual plans of planned inspections of legal entities and individual entrepreneurs (approved by Government Decree No. 489 on June 30, 2010), since enforcement of amendments to Federal Law No. 116-FZ of July 21, 1997, "On Industrial Safety at HIFs", inspections of organizations operating lifting platforms for disabled persons, escalators, lifts were excluded from the mentioned plan for 2013. However, over the

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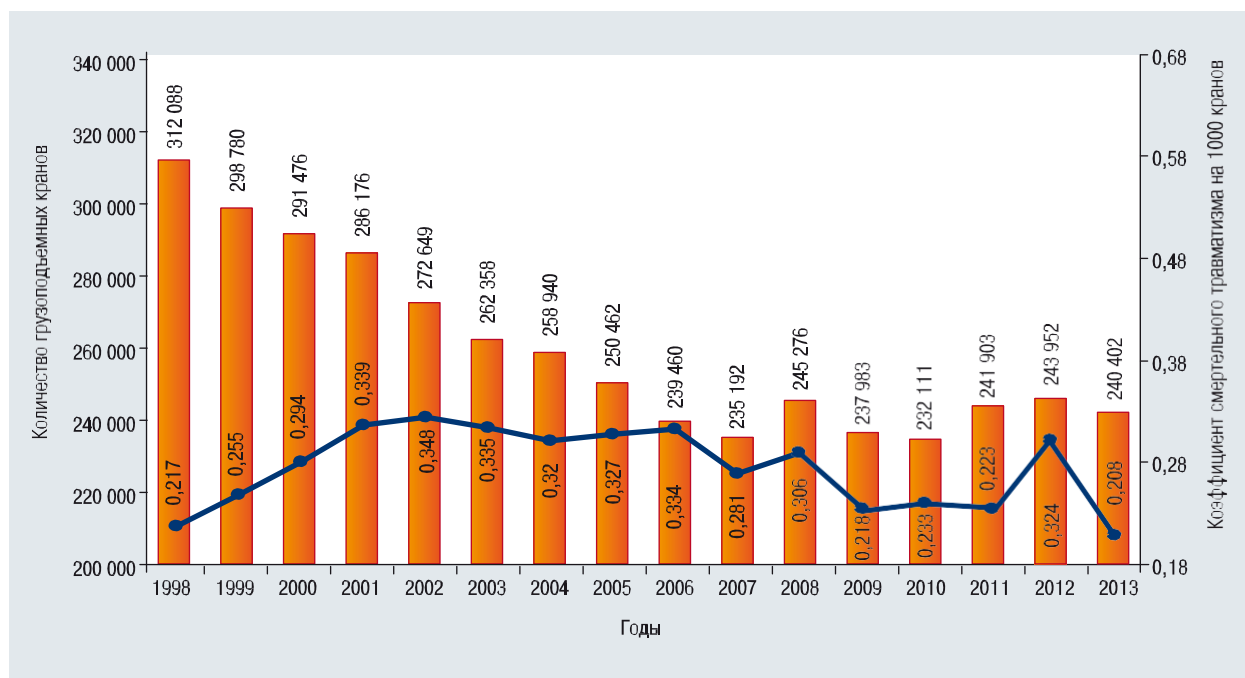
last 7 months of 2013 there were 1,675 inspections at organizations operating lifts. They were conducted within the scope of the state control (supervision) of compliance with the requirements of the Technical Regulations of Customs Union, "Safety of Lifts" (TR TS 011/2011).

Unscheduled inspections of organizations operating lifting platforms for disabled persons and escalators were held in compliance with the requirements of Federal Law No. 294-FZ of December 26, 2008, "On protection of rights of legal entities and individual entrepreneurs in the exercise of state control (supervision) and municipal control" and the Rules. Alongside, the Rules of arrangement and safe operation of lifting platforms for disabled persons (PB 10-403-01), approved by Decree No. 10 of Gosgortekhnadzor of Russia, dated March 11, 2001, the Rules for arrangement and safe operation of escalators (PB 10-77-94), approved by Decree No. 47 of Gosgortekhnadzor of Russia, dated August 2, 1994, are currently applied within the scope which does not contradict the legislation in force. The number of violations revealed during inspections in 2013 reduced to 22% in comparison with 2012. Efficiency coefficient of inspectors also drastically reduced (average amount of violations revealed during one inspection), in 2012 it was 8.14, and it was 4.31 in 2013.

Average amount of fines per one inspection was 0.36 in 2013.

In 2013, violations of the requirements of regulatory legal acts in the field of industrial safety were found during inspections in 45.7 % of all organizations inspected; statements of order were issued for elimination of these violations, the specific deadlines being determined.

8,249 administrative penalties were imposed for the violations, of which:



**Fig. 60.** Dynamics in the Russian crane fleet.  
Fatal trauma factor per 1,000 cranes



- administrative fines - 7,427 for the total sum of 258,118 million rubles (74.5 % of the total amount of fines imposed were collected);

- administrative suspension of activities — 770; prescriptions — 55.

94,27 administrative fines were imposed in the total amount of 284.01 thousand rubles in 2012. In comparison with 2012, the number of imposed administrative penalties in 2013 reduced to 21 %. Alongside, in 2013 there were 2.9% less administrative suspensions (in comparison with 2012) issued upon the results of inspections at facilities operating lifting structures with severe violations of the requirements of the regulatory legal acts in the field of industrial safety (in 2012 there were 793 administrative suspensions, and 770 in 2013).

Within 12 months of 2013, the employees of the Department of supervision over hoisting structures reviewed 177 industrial safety review reports, 167 of which were approved, and 10 were left without approval. Due to multiple violations of requirements to industrial safety review conclusions for technical devices applied at HIFs, upon a request of Rostekhnadzor the regional departments held unscheduled inspections of compliance with the license requirements and conditions of 6 organizations.

To implement decision by the Public Council under Rostekhnadzor intending for arrangement of regional workshops on implementation of the actual legislation on lifts within the scope of the workshops held by the National Lift Union, there was a number of visiting meetings with representatives of Headquarters and regional departments of Rostekhnadzor as well as supervised organizations. The meetings were dedicated to the issues of implementation the Technical Regulations of the Customs Union, "Safety of Lifts", and solution of challenges related to the lift fleet at the current stage of development of the lift industry in different regions of the country. Visiting meetings were held in the towns of Pushkino (North-Western Department), Ufa (West-Urals Department), Novosibirsk (Siberian Department), village of Olginka of the Krasnodar Region (North Caucasus Department), Kaliningrad (Central Department), and in Nizhniy Novgorod (Volga-Oka Department). In compliance with the 2013 Workshop (Meetings) Plan of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia, approved by Decree No. 6 of the Service on January 14, 2013, the Department for the State Civil Construction Supervision of Rostekhnadzor arranged and held a workshop with deputy heads and heads of dedicated departments of regional offices of Rostekhnadzor on the following topic: "Control and supervision in the field of supervision over lifting structures given the requirements of the legislation in the field of industrial safety and technical regulation." Participants of the workshop were 33 employees of regional offices of Rostekhnadzor.

The major task of the workshop was to inform the management and inspectors of regional departments of Rostekhnadzor on amendments in the industrial safety legislation, on requirements of the introduced technical regulations and orders of Rostekhnadzor, and to tell about the ways of conducting supervision to avoid typical mistakes when supervising industrial safety assurance at HIFs where lifting structures are operated.

The workshop was concluded at the round table discussion where they discussed typical situations and standard mistakes of industrial safety at supervised facilities. There were also clarifications to the representatives of the regional departments of

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Rostekhnadzor regarding all the issues of control and supervision.

In addition, within the workshop there was a visit to the 8th Specialized Exhibition of Lifting and Conveying Equipment, "Kran-Expo-2013". They also took part in the program of the exhibition where there were reports given by representatives of Bauman MSTU, N.E. MF "Certification of lifting and conveying equipment and rendering services of maintenance and repair of machines", JSC Expert Center of Urals, LLC Raduk, Company Maina-Vira, Russian TC 289 "Load Lifting Cranes", etc.

In 2013 employees of the State Civil Construction Supervision Department of Headquarters, together with representatives of state and executive authorities, representatives of TPE of RF, "Business Russia" and specialized lift organizations, took part in the 3rd All-Russian Congress of Lift Operators. They also took part in the Forum of Lift Industry Employees, Forum of Housing and Communal Service and Construction, in the 6th International Exhibition "Lift Expo Russia 2013" and in the All-Russian Conference of Lift Operators.

In 2013 the lifting structures supervision department of the Department for State Civil Construction Supervision performed final activities on creation of normative and legal framework for implementation by Rostekhnadzor of its functions in the view of changes in the industrial safety legislation.

Thus, Federal Law No. 22-FZ of March 4, 2013 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", some legislative acts of the Russian Federation and on invalidation of sub-item 114 of item 1, Article 33333 of Part II of the Tax Code of the Russian Federation" introduced changes into Federal Law No. 116-FZ of July 21, 1997, "On Industrial Safety of HIFs." Changes were in the classification of HIFs, formation of principles of risk oriented supervision over compliance by the operating organizations of industrial safety requirements.

Lifts, escalators (except for those in the subway) and platforms for disabled persons are excluded from the list of equipment which is a sign of referring the facility to HIFs, and they are referred to the facilities which are dangerous and are not covered by the provisions of FZ-116, "On industrial safety of hazardous industrial facilities." Such facilities are covered by requirements of Federal Law No. 225-FZ dated July 27, 2010, "On compulsory civil liability insurance of owners of hazardous facilities for any harm inflicted as a result of an accident."

HIFs where only fixed load lifting mechanisms are applied (except for the lifts, elevating platform for disabled persons), escalators in the subway, funiculars (lifting structures) are referred to hazard class 4, so, their state supervision is envisaged in the form of monitoring of data from the operating organizations, but without scheduled inspections due to identification and stating such facilities as those of low risk of accident during HIF operation.

Due to the stated hazard class because of the changes introduced into Federal Law No. 116-FZ, "On Industrial Safety of Hazardous Production Facilities", there was a reduction in the number of facilities referred to higher hazard classes of HIFs in relation to which state supervision and control were envisaged in the form of scheduled inspections. Thus, the reporting data of regional offices state that among 67,942 HIFs where lifting structures including lifts were in operation, only 46,493 HIFs were left after re-registration with assignment of appropriate class (which is about 68 % of the total number). Out of them, 42,100 facilities were assigned to

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hazard class 4, 3,100 facilities with lifting structures were assigned to hazard class 3, 780 and 435 facilities were assigned to classes 2 and 1 appropriately and included lifting structures. Simultaneously with changes in Federal Law No. 116-FZ "On Industrial Safety at HIFs", Rostekhnadzor got new authorities established by Government Decree No. 407 of May 13, 2013, "On authorized bodies of the Russian Federation on ensuring state control (supervision) over compliance with technical regulations of the Customs Union", as the Commission of the Customs Unions approved technical regulations of the Union, "Safety of Lifts", "Safety of Machines and Equipment", which were enforced in 2013 and establish requirements to design, manufacturing and confirmation of compliance of technical devices which are put into circulation for the first time in the countries of the Customs union, and earlier provided in the Rules of Arrangement and Safe Operation of appropriate supervised equipment.

Under the authorities on control (supervision) over compliance with the requirements of technical regulations of the Customs Union, Rostekhnadzor is assigned to control and supervise the following:

- lifts and safety devices of lifts which are operated at HIFs - at the stage of their operation and during assembly in construction and re-construction of capital construction facilities, in relation to which control (supervision) over compliance with the obligatory requirements set up by the Technical Regulation is ensured by the federal executive authorities or executive authorities of the constituent entities of the Russian Federation during state civil construction supervision and in compliance with the legislation of the Russian Federation on urban construction;

- in relation to machines and equipment which include lifting structures controlled and supervised by Rostekhnadzor at supervised facilities and processes of operation and decommissioning related to the requirements to such products.

In addition, Government Decree No. 407 of May 13, 2013, assigns Rostekhnadzor to perform state control (supervision) over compliance with the obligatory requirements to products with valid compliance assessment documents (confirmation) which were manufactured and issued in compliance with the obligatory requirements set by the legislation of Russia on technical regulation which had been in force before the Technical Regulations of Customs Union "Safety of Lifts", "On Safety of Machines and Equipment" were enforced.

To put the legislative framework in line with the Russian legislation, Rostekhnadzor develops regulatory legal acts defining obligatory requirements to assembly, operation, repair, upgrade, re-construction and decommissioning of lifting structures to replace the Rules of Arrangement and Safe Operation of Appropriate Supervised Equipment which are subject to invalidation in 2014.

With immediate participation of staff from Rostekhnadzor Headquarters the following regulatory legal acts were developed and are now at a high level of readiness: Federal codes and regulations in the field of industrial safety; "Safety Regulations for HIFs with Lifting Structures"; Federal codes and regulations, "Safety Regulations for Operation of Cargo Cable-Ropeways"; Federal codes and regulations, "Safety Regulations for Operation of Passenger Cable-Ropeways and Funiculars"; Federal codes and regulations, "Safety Regulations for Operation of Escalators in Subway"; All the listed documents passed through public discussions and assessment of regulatory impact, and federal codes and regulations "Safety Regulations for HIFs with Lifting Structures" also underwent the registration

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procedure at the Ministry of Justice of Russia on December 31, 2013, Registration No. 30992 and of January 17, 2014, Registration No. 31036 appropriately.

Federal codes and regulations, "Safety Regulations for Operation of Passenger Cable-Ropeways and Funiculars", federal codes and regulations "Safety Regulations for Operation of Escalators in Subway" are sent for approval to the interested federal executive authorities, including the Ministry of Industry and Trade, Ministry of Internal Affairs, EMERCOM of Russia, Chief Department for Special Programs under the President of the Russian Federation, Federal Security Service, Federal Protection Service of Russia. Rostekhnadzor Headquarters also developed draft Government Decrees:

"On approval of procedures for investigating causes and circumstances of accidents at hazardous facilities - lifts, load lifting platform for disabled persons, escalators (except for those in the subway)";

"On approval of provisions on the commissioning procedure and accounting of lifts";

"On introduction of changes into Decree of the Government of the Russian Federation No. 407 of May 13, 2013".

To provide the list of exercised state functions and provided state services as per the authorities assigned to Rostekhnadzor, Rostekhnadzor together with its employees developed a draft Decree of Rostekhnadzor on approval of the Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service on execution its state function for state control (supervision) over compliance with the requirements of the Technical Regulations of the Customs Union "Safety of lifts."

To ensure fulfillment of requirements of the developed Federal Codes and Regulations in compliance with the authorities assigned to Rostekhnadzor by Government Decree No. 407 of May 13, 2013, in 2014 it is planned to develop safety guidelines with recommendations on how to perform state control (supervision) over compliance with the requirements of regulatory legal acts and regulatory documents in the field of industrial safety of facilities of the Boiler Equipment Supervision and Lifting Structures.

In 2014, to inform about changes in the industrial safety legislation, clarifications on practical implementation of requirements stated by the technical regulations and federal codes and regulations. It is also planned to hold a series of topical workshops where leading specialists of scientific, expert and design organizations, together with Rostekhnadzor specialists, who were directly involved into development of new regulations, would answer all the questions regarding changes in the legislation on industrial safety and technical regulation, classification introduced for HIFs and risk oriented supervision, as well as adoption and enforcement of new regulations.

During preparation for the 22<sup>nd</sup> Olympic Games and the 11th Paralympic Games of 2014 in Sochi, to implement the Program of Construction of Olympic Facilities and Development of Sochi as a Mountain and Climatic Resort, Rostekhnadzor inspected facilities which were constructed for the Games. During the control events, devices installed at the facilities being constructed were also inspected. 796 lifts, 66 escalators and 46 lifting platforms for disabled persons were inspected. Upon the results of the inspections, there were meetings with the general contracting construction and assembly organizations about each facility. At those meetings representatives of Rostekhnadzor informed the participants about their notes to the constructed facilities and technical devices, after that together with the

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representatives of construction and assembly organizations they developed and approved measures for elimination of the stated notes.

During preparation for the Olympics, Rostekhnadzor issued 16 permits for the use of newly installed ropeways.

Taking into account the results of the accident which occurred in heavy snow on January 13, 2013, because of a tree falling on the process cross-beam of the support of Olympia overhead ropeway (lift A) in the town of Sochi (village of Esto-Sadok), when large branches of the tree led to opening of clutches of the cabins and to fall of two booths without passengers. One of the causes was the lack of cooperation between the operating organization LLC Rosa Hutor with representatives of the Federal Wood Agency. Headquarters of Rostekhnadzor seriously worked with its regional offices to inform organizations operating ropeways that it was obligatory to

- have in the design of ropeways of distribution by assessment of accidents risk;
- perform continuous monitoring of the territories nearby the routes of the ropeways to find there trees which could fall;
- to make decisions regarding to cut top of the trees which were over the permissible height;
- perform by the personnel of requirements of their job description and procedure instructions taking into consideration the results of examination of the territories around the ropeways.

Together with the Federal Wood Agency they monitored all the ropeways installed in Sochi. The operating organizations received letters with the lists of measures to be taken for safe operation of the ropeways.

By the end of 2013 the said measures were completely implemented. According to the directions of the State Civil Construction Supervision of Rostekhnadzor Headquarters, the organizations operating ropeways took all the measures to ensure safe operation of the ropeways (cutting of trees, fastening, cutting tops of trees).

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#### *2.2.20. Electrical Power Plants, Boiler Houses, Electrical and Thermal Installations and Grids*

The number of power engineering facilities subject to supervision by the Federal Environmental, Industrial and Nuclear Supervision Service of Russia was more than 3.2 million, including:

533 thermal power plants;

195 gas turbine power plants; more than 111 thousand boiler houses;

more than 854 thousand transformer substations; more than 1.8 million electric power consumers; more than 490 thousand thermal power consumers;

and more than 5 million km of power transmission lines.

In 2013 Rostekhnadzor Headquarters arranged and conducted 2 comprehensive inspections of power engineering entities LLC Lucoil-Volgogradenergo and JSC FGC UES.

Besides, in the framework of state energy supervision Rostekhnadzor territorial departments were inspected.

Within the reporting period, the inspectors of the Rostekhnadzor territorial departments conducted more than 126 thousand examinations to check the arrangement of safe operation and technical state of equipment and main facilities of the power plants, electrical and heat networks of power supply organizations, electrical and thermal consumer installations. More than 580 thousand violations were revealed during the inspections.

The inspections revealed low level of arrangement and unsatisfactory state of the following:

personnel training and qualification upgrading;

technical upgrading and reconstruction of power plants and networks; renovation of basic production assets.

The total number of legal entities and individual entrepreneurs during the inspections of which violations were revealed is 35.7 thousand. 38,966 administrative penalties were imposed upon the results of the inspections.

The amount of fines imposed was more than 174 million rubles.

Territorial departments conducted 6 inspections during the reporting period, and submitted relevant documents upon the results of the inspections to law enforcement bodies.

The inspectors allowed the operation of more than 50 thousand of new and modernized power-engineering installations.

There was a great scope of actions related to the inspection of preparation of power and heat supply organizations for the autumn and winter periods of 2012/2013.

During the reporting period Rostekhnadzor inspected the safety state of power and heat supply organizations regarding the autumn and winter periods of 2012/2013, in particular, the following: 88 power plants, 5,434 heating and 4,936 heat-production boiler houses, 432 heat grid organizations and 156 electric grid organizations.

In the course of inspections more than 11 thousand violations of the safety codes and regulations during operation of heat-power equipment were revealed; 304 legal entities and 890 individuals were subjected to prosecution.

In the course of inspections it was revealed that production control was unsatisfactory at 105 supervised power supply organizations; 133 organizations were not completely staffed with trained and qualified specialists.

Rostekhnadzor territorial departments forwarded letters concerning unsatisfactory safety state of power installations in power and heat supply organizations to the following persons and bodies:

authorized representatives of RF President in Federal Districts -20;

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prosecuting authorities - 33;

governors of RF constituent entities - 6,

executive authorities of RF constituent entities - 43, local authorities - 278.

Information about activities implemented by Rostekhnadzor territorial departments and data on the power and heat supply organizations, the inspection of which showed unsatisfactory results regarding their safety state in the autumn and winter heating periods of 2012/2013, were forwarded to the Ministry for Regional Development (Minregion) of Russia, the Ministry of Energy (Minenergo) of Russia.

In pursuance of protocol decision No. 16 (section V, item 3) of May 23, 2013, made at the session of the Government of the Russian Federation, and order of Mr. D.N. Kozak, Deputy Prime Minister of the Russian Federation, No. DK-P9-4695 of July 3, 2013, Rostekhnadzor issued Order No.298 of July 10, 2013 On Inspection of the Progress of Preparation of Housing and Communal Services and Power Engineering Enterprises for the Autumn and Winter Period of 2013-2014.

Starting since July 10, 2013, Rostekhnadzor territorial departments issued orders and arranged unscheduled inspections of the progress of preparation of housing and communal services and power engineering enterprises for the autumn and winter period of 2013-2014.

In the framework of safety state inspections of power and heat supply organizations regarding their preparation for the autumn and winter period of 2013-2014, Rostekhnadzor territorial departments examined 457 power plants, 26,385 heating and 1,543 heat-production boiler houses, 944 electrical grid and 2,645 heat grid organizations during the period from May till November 15, 2013.

The inspections conducted during the above-mentioned period demonstrated that in most regions of the Russian Federation the preparation for the autumn-winter period was completed according to the schedule.

During the preparation for the autumn-winter period power supply organizations repaired power plants equipment. The implemented repair activities made up 94% of the planned scope, including the following: repair of power boilers - 95%, water boilers - 97%, turbines - 91%, generators - 93%.

The repair of heat-production boiler houses and heating boiler houses made up 107%, heat networks - 98%, central heating stations - 100%, electric networks - 133%, electric power substations - 99%.

In the course of inspections, conducted by Rostekhnadzor territorial bodies, more than 80 thousand violations of the safety codes and regulations during operation of power equipment were revealed; 4,417 individuals and 1,147 legal entities were subjected to prosecution. Therewith it was found that production control was unsatisfactory at 155 supervised organizations; 373 organizations were not completely staffed with the trained and qualified specialists. Rostekhnadzor territorial departments forwarded letters concerning unsatisfactory safety state of power installations in power and heat supply organizations to the following persons and bodies:

authorized representatives of RF President -69; prosecuting authorities - 153;

governors of RF constituent entities - 34;

executive authorities of RF constituent entities - 110, local authorities - 522.

In accordance with the provision on inspection of the of preparation of power engineering entities for the autumn and winter period, approved by the Governmental Commission for Electric Power Safety Assurance (of the federal headquarters), Protocol No.10 of July 6, 2012, the representatives of Rostekhnadzor territorial departments participated in the assessment of the of preparation of power and heat supply organizations for the autumn and winter period of

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2-13/2014 and in the issue of relevant certificates thereto.

As of November 15, 2013, 9,458 out of 9,984 Russian power supply organizations, subject to certification, obtained the certificates confirming their preparedness, which makes up 95% of the total number of organizations.

The number of prepared power engineering entities made up 97.7% (1,207 organizations out of 1,236). The number of prepared housing and communal service organizations made up 93.6% (8,280 organizations out of 8,848).

The main reasons for denial of the certificates confirming preparedness are the following: work places are not staffed with trained and qualified personnel; technical examinations of equipment, industrial safety review

are not performed in time;

repair activities or commissioning tests are not performed;

power supply diagrams do not comply with reliability requirements (standby power supply for boiler houses);

absence of operable reserve of fuel handling facilities;

absence or inoperability of safety automation.

On November 16, 2013, Rostekhnadzor territorial departments began inspecting activities related to the heating period of 2013/2014.

During the period from November 16 to December 31 2013, Rostekhnadzor territorial departments examined 27 power stations, 60 heating and industrial boiler houses and 566 heating boiler houses, 107 electric grid organizations and 126 heat grid organizations. More than 3 thousand violations of safety codes and standards regarding power equipment operation were revealed during the inspections;

97 legal entities and 243 individuals were subjected to prosecution.

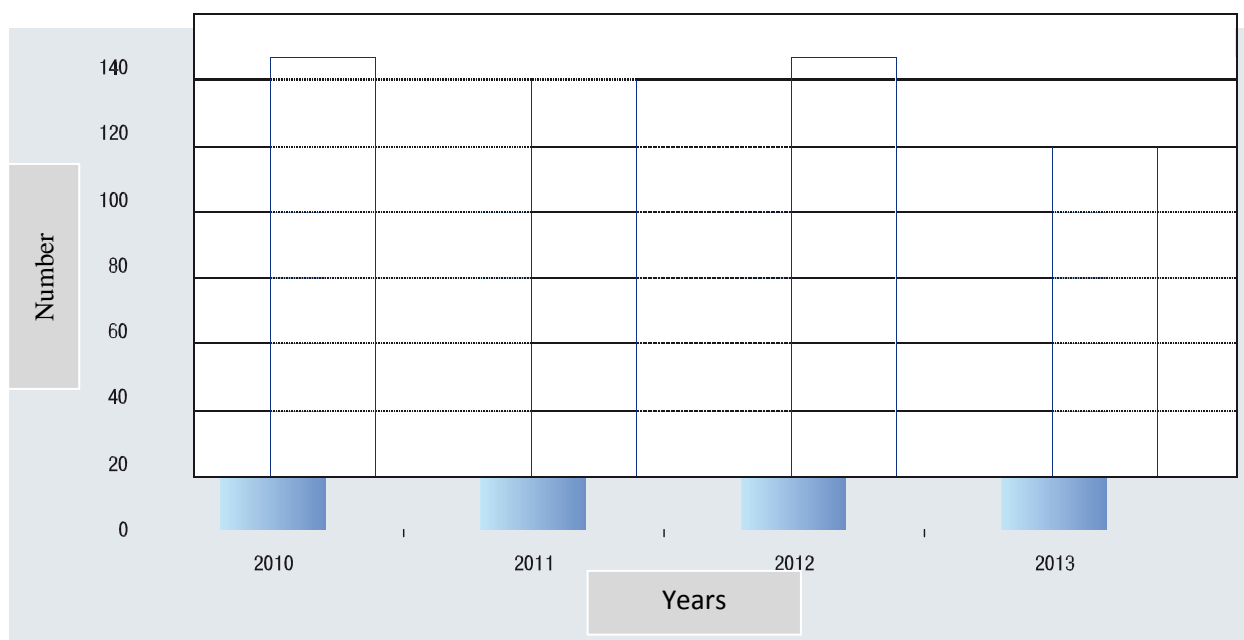
In the course of inspections it was revealed that production control was unsatisfactory at 10 power supply organizations; 51 organizations were not completely staffed with the trained and qualified specialists.

Information about activities implemented by Rostekhnadzor territorial departments and data on the power and heat supply organizations, the inspection of which showed unsatisfactory results regarding their safety preparedness for the autumn and winter periods of 2013/2014, were forwarded to the Ministry for Regional Development (Minregion) of Russia, the Ministry of Energy (Minenergo) of Russia.

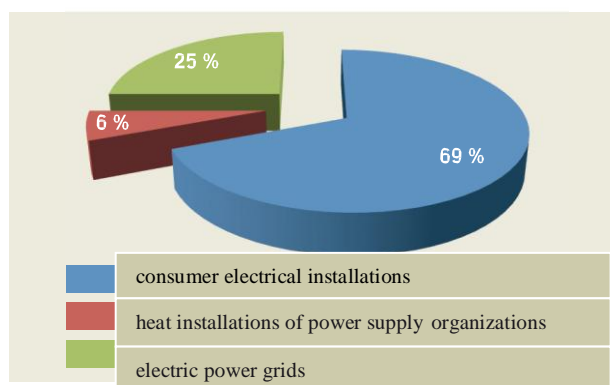
101 fatal accidents took place in the reporting period of 2013, whereas in 2012 127 fatal accidents occurred during 12 months.

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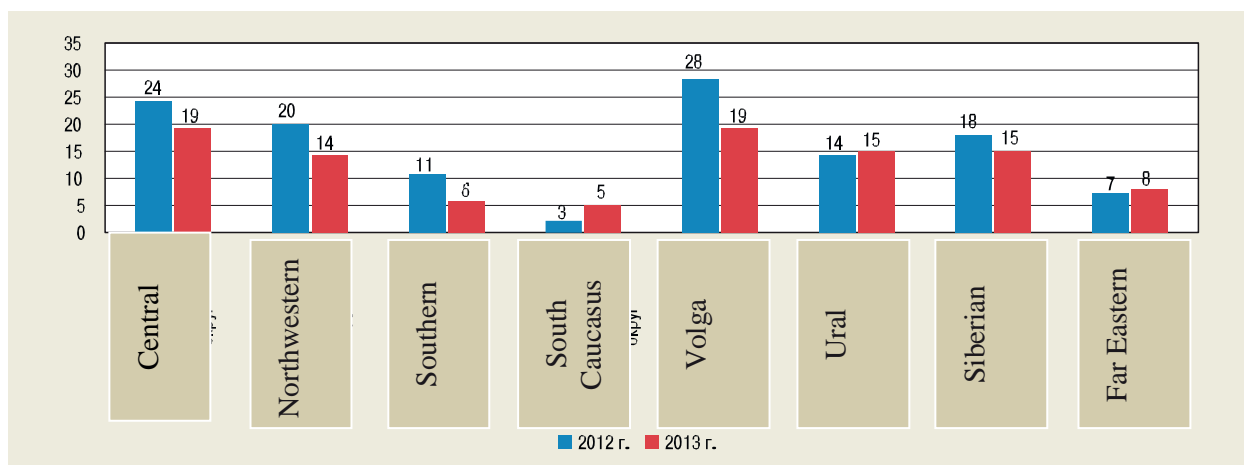
**Fig. 61** Fatal Injury Dynamics of a power engineering facilities



**Fig. 62** Distribution of accidents by different types

Statistics show that the number of accidents has not decreased at power facilities during the last 4 years. In 2013 there was a downward trend (Fig. 61). It confirms the effectiveness of control and preventive measures related to injuries in supervised organizations.

In 2013 most of fatal accidents took place at consumer electrical installations - 70 (69%) and at electric power grids - 25 (25 %), heat installations of power supply organizations - 6 (6 %) (Fig. 62).

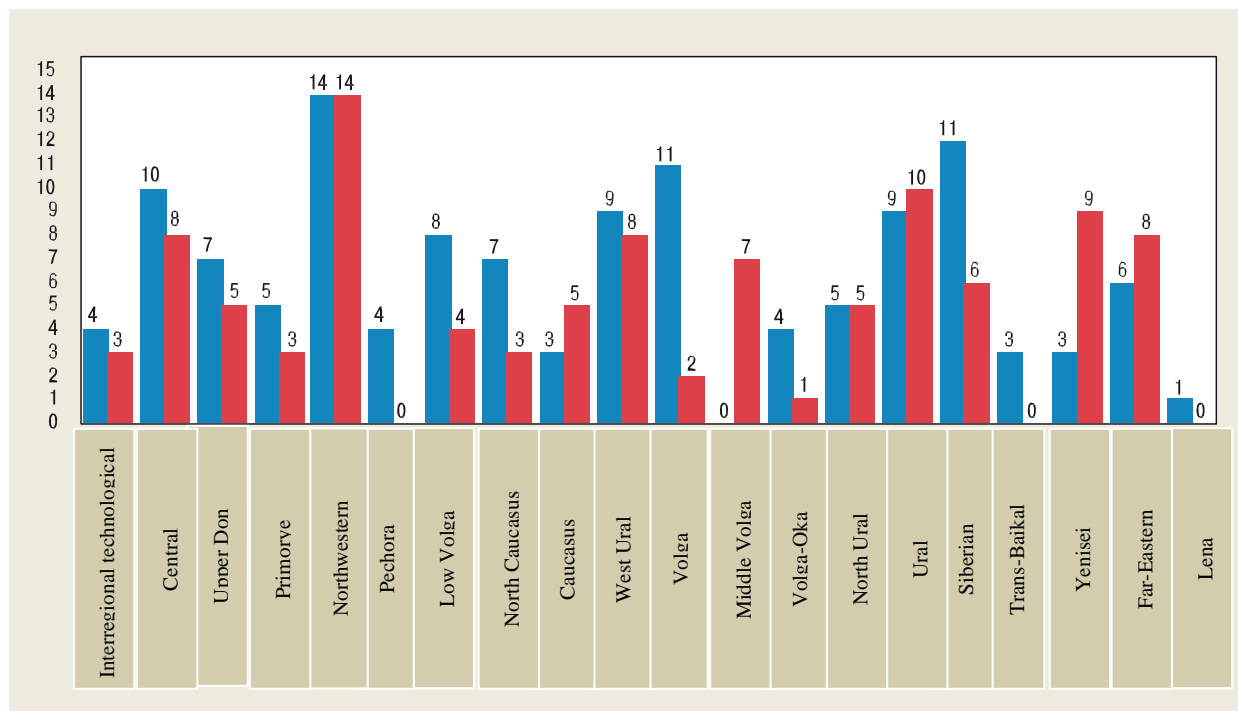


**Fig. 63** Distribution of accidents by RF Federal Districts.

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Distribution of accidents by RF Federal Districts is shown on Fig. 63.

Most of the fatal accidents took place in organizations supervised by Northwestern Department (14), Ural Department (10), Yenisei Department (9), Central Department (8), Western-Ural Department (8), Far-Eastern Department (8) (Fig.64).



**Fig. 64** Distribution of accidents by Rostekhnadzor territorial departments.

The main technical causes of the accidents: mistakes of the victims;  
violation of the work procedure;  
failure to fulfill measures on the prevention of the unauthorized hazard in the working (hazardous) area;  
opening of doors, manholes, removal of enclosures to enter the hazardous zone;  
disability, absence of or failure to use the individual protective equipment.

The main organizational causes of the accidents:

poor control of the activities by the persons in charge of the work safety;  
poor labor discipline;  
unsatisfactory arrangement of activities by administrative and engineering staff;  
failure to document activities by work orders or instructions; unsatisfactory arrangement of access to activities.

Basing on the analysis of the circumstances and causes of the accidents the managers of enterprises, organizations and institutions were instructed to do the following:

to hold unscheduled briefings on occupational safety and to examine knowledge of operation rules and inter-industry occupational safety rules;

to investigate accident circumstances and causes;

to examine the knowledge of managers and specialists regarding occupational safety on an unscheduled basis;

to enhance administrative supervision and control; to teach personnel safe work procedures.

On **May 31, 2013** an accident occurred to an electrician in charge of the repair and maintenance of metallurgical equipment when he was implementing technical maintenance of the electrical



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installation at the JSC Volgograd Steel Works Red October.

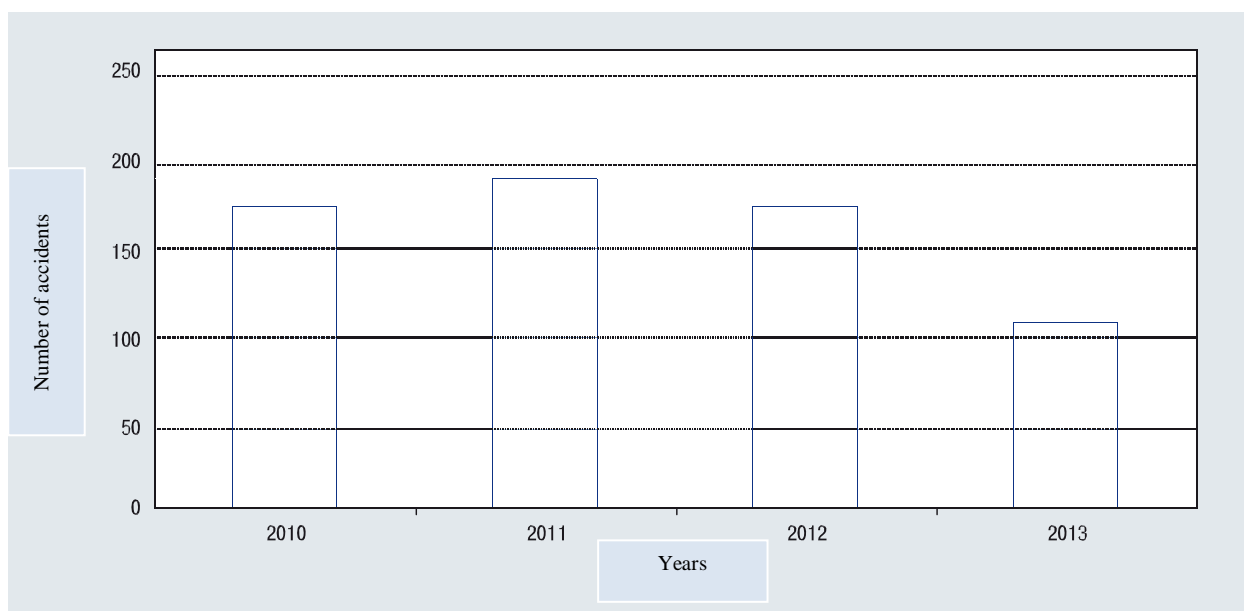
While examining and reviewing bus isolators in chambers No. 6 and No.4 of substation No. 48 (indoor switchgear 35kV), the electrician disconnected the isolators, turned on grounding blades and de-energized section No.2. Then he opened the doors of chamber ShRk-14 powered from the first section, having presumably mixed up the inputs. He performed activities in chamber ShRk-14 where the vacuum breaker had been disconnected long before the accident, therefore there was no voltage in chamber electrical equipment. After it he went to chamber ShRk6 powered from input No.1, opened chamber doors and approached electrical contacts under voltage too closely. The electrician got body surface burns from the electric arc, which led to his death at the hospital.

Another typical example of a fatal accident is the one that occurred on **August 5, 2013**, to an engineer of the second category of the LLC Naladka YuVEM. The engineer was sent on a business trip by the JSC Production and Commercial Company Voronezh Ceramics Factory (Voronezh).

The engineer for adjustment of electrical equipment inspected the results of the burn down of a damaged cable. When the engineer was performing the inspection, the power supply center of Voronezhenergo, JSC MRSK-Central branch, energized the tested cable KL-6 kV through the second cable under voltage. As a result of this, the engineer got a fatal injury.

108 accidents took place during 12 months in 2013 (in 2012 - 173) (fig.65).

Most of the accidents (58, which makes up 52% of the total number) took place because of equipment shutdown at thermal power plants, hydraulic power plants (generators, turbine generators, etc.) or electrical supply network facilities, which led to decrease in power system reliability, power system split into parts, and isolation of several RF power districts from the Unified Power System of Russia.



**Fig. 65** Number of accidents in 2010-2013

For example, on **July 29, 2013**, an accident occurred in the power system of the Republic of Komi which resulted in the disconnection of 194,500 consumers. Investigation showed that damage of the overhead power transmission line VL 110 kV was the primary cause of the accident. A significant number of consumers lost connection with power supply because relay protection equipment was morally obsolete.

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There were 32 operational occurrences in dispatch and process control devices, leading to disconnection (from dispatch communication and telemetry data transmission). Such occurrences are classified as accidents and make up 31% of the total number of accidents at power engineering facilities.

One of the most significant accidents, classified as power network facility shutdown, took place in Kaliningrad power system on August 8, 2013.

At 22:01 Moscow time, when there was a thunder head in Sovetsk town, 330 kV power generation line of Kaliningrad heating plant-2 (L-414) got disconnected, which led to the immediate actuation of emergency automatic equipment at Kaliningrad heating plant-2 and the shutdown of one of the generators. Further on all the operating generators got disconnected because of incorrect operation of process protection. The heating plant de-energized losing auxiliary power supply. Therefore, the western part of Kaliningrad region (645,300 inhabitants) lost power supply (of about 320 MWe power capacity).

Besides, in 2013 the number of accidents related to the damage of a 10 MWe turbine increased. The damage of the turbine led to forced downtime in equipment repair for more than 25 days. There were 7 accidents like that, including an accident at a state district power station in Middle Ural region.

On November 10, 2013, at 18:32 Moscow time a turbine was damaged at the accident at a state district power station in Middle Ural region. After the gas turbine installation was shutdown and cooled, the inner part of a waste heat boiler was examined. It was revealed that the blades of the third (last) stage of the gas turbine were damaged.

The analysis of the consumer power supply suspension demonstrates that the main reasons are old equipment and grids, loss of power supply, unskilled actions of the maintenance staff.

According to the results of 2013, there are the following main causes of accidents in electric grid equipment:

most frequently operational occurrences in dispatch and process control devices are connected with the absence of standby communication channels or failure to maintain their operability, as well as with erroneous actions of personnel during channel switching and transferring to standby power sources;

wear of equipment during long-term operation;

disconnection because of thunder heads, leading to the development of accidents due to high resistance of the grounding devices of overhead line supports and interruptions in the operation of automatic control equipment;

overgrowing of cross cuts leading to wires being touched by trees, falling of trees onto the wires of overhead lines due to the failure to clear overhead line routes in time;

incorrect operation of monitoring and emergency automation equipment due to design errors, deviations from designs during equipment installation and operations, erroneous actions of dispatching and operating personnel;

low quality of maintenance leading to equipment failure due to interruptions in relay protection and automation, short circuits, flashover of porcelain insulators;

transfer of over-sized cargo, activities with motor crane next to an overhead line, unauthorized forest felling and transporting during which wires are touched, ground fault takes place and the accident develops further;

manufacturing flaws of equipment leading to mechanical damage, equipment destruction and potential inflammation;

throwing of conductive items (conductive film, wire) over overhead line wires, which leads to short circuits.

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In accordance with RF Government Decree No.67 of February 20, 2010 "On changes in several RF Government statements related to the establishment of the authorities of federal executive bodies in the field of energy saving and enhancement of energy efficiency", Rostekhnadzor exercises authorities related to the control of and supervision over energy saving and enhancement of energy efficiency:

observance, within its sphere of competence, by owners of non-residential buildings, structures and installations of the requirements for energy efficiency imposed on such buildings, structures and installations in the course of their operation; as well as observance of the requirements for equipping them with devices for accounting the energy resources consumed; observance by legal entities in whose charter capital the share (interest) of the Russian Federation, constituent entity of the Russian Federation, municipality makes over 50 percent and/or concerning which the Russian Federation, constituent entity of the Russian Federation of the Russian Federation, municipality have the right to directly or indirectly be in command of over 50 percent total votes attaching to voting shares (stock), which constitute charter capital of such legal entities, by state and municipal unitary enterprises, state and municipal organizations, state companies, state corporations, as well as by legal entities, whose property or over 50 percent shares or interest in the charter capital belong to state corporations, of the requirement to adopt programs in the field of power saving and improving energy efficiency; conducting obligatory energy surveillance on the established dates;

Up till now no requirements for the energy efficiency of buildings, structures and constructions have been established. Therefore, Rostekhnadzor fulfills one of the three functions related to the control of and supervision over the compliance with the requirements of legislation regarding the enhancement of energy efficiency only by controlling the availability of energy resource accounting devices.

Basing on the results of the implemented activities, it was revealed that 635 organizations violated the requirement for power saving program adoption. 162 legal entities and 161 individuals were penalized; the total amount of the fines imposed made up 11.2 million rubles. Territorial departments discovered 775 non-residential buildings not equipped with energy power accounting devices. 76 legal entities and 183 individuals were penalized. The total sum of fines imposed made up 7.3 million rubles.

During 2013 (12 months) Rostekhnadzor territorial departments inspected 21.9 thousand organizations that were to implement the first obligatory energy surveillance not later than December 31, 2012 in accordance with current legislation. The inspections revealed that 4 thousand organizations failed to meet the established time limit. 1,695 legal entities and 1,991 officials were brought to administrative responsibility for the violations. The amount of the fines totaled 107.5 thousand rubles.

In the framework of the "Program of construction of the Olympic facilities and Sochi town development as the skiing resort," Rostekhnadzor arranged constant supervision over the construction of Olympic facilities. Personnel from other territorial departments also took part in the supervision.

In 2013 more than 2,687 examinations of new and reconstructed electrical installations were performed. 2,232 permits for the operation of 6,000 new (reconstructed) electrical installations were issued upon the results of the examinations.

After re-commissioned electrical installations were subjected to primary examination, 70% of them obtained examination reports with negative conclusions saying the following: "The electrical installation does not comply with the requirements of the regulatory and technical documentation, thus, its operation is not allowed".

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In the framework of the implementation of the federal target program "Economic and social development of the Far East and Transbaikalia for the period until 2013" for 2013, 498 inspections were held (primary before admittance to operation and with drawing up of permits for operation according to the permanent scheme and for pre-commissioning activities); 1,781 violations were revealed; 217 protocols were drawn up, 47 of them were for individuals. 450 electrical installations got permits for operation during pre-commissioning activities.

#### 2.2.21. Hydraulic Engineering Structures (HES)

The federal state supervision in the field of safety of hydraulic engineering structures (the HES) is exercised by 22 Rostekhnadzor territorial departments in 83 constituent entities of the Russian Federation and in eight territorial regions.

Total number of HES systems, power engineering and water utilization systems, supervised by Rostekhnadzor, is 30,188, including: 844 HES of liquid industrial wastes including: 365 HES systems of tailing pits and slurry pits of the mineral resource industry; 377 HES of the waste storages of the chemical, petrochemical and refinery industries; 102 HES systems of waste accumulators of the metallurgy industry;

568 HES of the Fuel and Energy Complex, including: HPPs - 218, state district power stations - 80, central heating and power plants - 256, pumped storage power plants - 3; NPPs - 11;

28,776 HES of the water utilization system, including: under the supervision of the Ministry of Agriculture of Russia – 1,481, under the supervision of the Russian Water Resources' Agency - 884, abandoned HESs – 5,772, other – 20,639.

According to SNiP 33-01-2003 "Hydraulic engineering structures. General provisions", HES are classified depending on their elevation and foundation soil types and divided as follows:

class I - 116 complexes;

class II - 332 complexes;

class III - 669 complexes; class IV – 29,071 complexes.

According to the Russian HES Register, the safety level of the supervised HES has been assessed as follows:

39.4% of the total number of HES systems are at normal safety level where HES have no defects and damage which may, as they evolve, lead to an accident, and HESs are operated in accordance with the safety codes and standards;

43.4% of the HES systems are at a lower safety level where the structures are in normal technical state but with violation of operation regulations;

12.5% of the HES systems are at unsatisfactory safety level which is characterized by an increased first (preventive) level of the values of safety criteria and limited function of the structures;

4.7 % of the HES systems are at the hazardous safety level characterized by increased maximum allowable values of the safety criteria, loss of function and inoperability.

In 2013 Rostekhnadzor reviewed and approved 380 declarations of HES safety (HES complexes) and expert reports on HES declarations of safety (headquarters - 164; territorial departments - 216).

In 2013 Rostekhnadzor provided the Russian Water Resources' Agency with data on 381 facilities operating the HES.

333 permits for HES operation were drawn up and issued (headquarters - 147; territorial departments - 186).

In 2013 Rostekhnadzor conducted 3,877 inspections of legal entities and individuals (in 2012 –

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4,055 inspections), 1,751 of them were scheduled inspections (45.2% of the total number of conducted inspections) (in 2012 – 1,650 inspections (40.7%).

In 2013 2,126 unscheduled inspections were conducted (in 2012 – 2,405). The unscheduled inspections were conducted on the following basis:

within the framework of statements of orders issued earlier following the results of previously conducted inspections - 707 inspections (33.3 %), (in 2012 - 691 inspections (28.7 %);

imminent infliction of harm on the life and health of citizens, and damage to animals, plants, the environment, objects of cultural heritage (historical and cultural monuments) of the peoples of the RF, safety of the state, and natural and man-caused hazards - 40 inspections (1.9 %), (in 2012 - 64 inspections (2.7 %);

order (directive) of the head of the state control (supervision) body issued in accordance with the instructions of the President of the Russian Federation and the Government of the Russian Federation - 263 inspections (12.4 %) (in 2012 - 327 inspections (13.6 %);

other grounds laid down by the legislation of the Russian Federation – 1,116 inspections (52.5 %), (in 2012 - 864 inspections (36 %).

In the course of inspections conducted by the Rostekhnadzor territorial departments 12,351 violations were revealed within the reporting period (in 2012 -15,305).

1,467 administrative penalties were imposed upon the results of the conducted inspections (in 2012 – 1,827).

The amount of the imposed administrative fines totaled 29,525 thousand rubles. (in 2012 – 26,785 thousand rubles).

Work performed in 2013 contributed to revealing abandoned HES and reducing their number.

The number of abandoned HES decreased by 1,297 structures (18.3%), which is from 7,069 (as of January 1, 2013) to 5,772 structures, among which are the following:

994 - with normal safety level (2012 – 1,097); 3,729 - with lower safety level (before – 4,622);

845 - with unsatisfactory safety level (before -1,138); 204 - with hazardous safety level (before - 212).

440 new abandoned HES were revealed during the reporting period, among which are the following: 56 - with normal safety level;

337 - with lower safety level;

43 - with unsatisfactory safety level;

4 - with hazardous safety level.

Rostekhnadzor territorial departments forwarded 297 notifications to municipal entities so that they take measures on the accounting of abandoned HES, as well as 105 notifications to state authorities of the constituent entities of the Russian Federation so that they too measures on the assurance of abandoned HES safety.

Local authorities and state authorities of the constituent entities of the Russian Federation took the following measures:

registered 874 abandoned HES at state registration bodies; registered ownership for 843 abandoned HES, including the following:

129 - with normal safety level;

549 - with lower safety level;

158 - with unsatisfactory safety level;

7 - with hazardous safety level.

As of January 1, 2014, measures on liquidation of 29 abandoned HES are taken. The HES being liquidated are the following:

2 - with normal safety level;

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26 - with lower safety level;

1 - with unsatisfactory safety level;

894 abandoned HES were liquidated, including the following:

30 - with normal safety level;

681 - with lower safety level;

178 - with unsatisfactory safety level;

5 - with hazardous safety level.

During the springtime high water and flood 4 accidents related to HES damage occurred at supervised facilities, leading to emergency situations.

Analysis of materials for the investigation of accident causes showed that HES owners and (or) operating organizations do not fulfill the requirements of RF legislation related to HES safety, namely:

no measures on HES safety assurance are taken, including measures on setting safety criteria, HES equipping with hardware for HES state monitoring, preliminary measures on minimizing the risk of emergency situations at the HES;

no control (monitoring) of HES state parameters during natural phenomena and man-caused events is provided, HES safety assessment is not performed (including regular HES safety assessment and the analysis of the causes of decrease in safety level taking into account HES cascade operation, hazardous natural and man-induced impacts, results of business and other activities including construction and operation of facilities located at water facilities or areas adjacent to the HES from above or below. Specialists and personnel in charge of HES operation and maintenance are not sufficiently qualified; there are no regular (multifactor) examinations of HES state, HES hardware and equipment, including examinations with the participation of hydraulic specialists from research and development and design organizations; there are no financial or material resources for

HES accident liquidation;

there is no proper financing of HES operation, assurance of operation safety, measures on the prevention or liquidation of HES accident consequences;

there are no sufficient available resources of construction materials, means and special equipment for immediate localization of damages or emergency situations at the HES; there are no available and equipped emergency repair and rescue crews.

#### *2.2.22. State Civil Construction Supervision*

##### **2.2.22.1. State Civil Construction Supervision in Construction, Modernization and Overhaul of Capital Construction Facilities**

As per Resolution of the Government of the Russian Federation "On state construction supervision in the Russian Federation" No.54 of February 1, 2006, and the Administrative Regulations for the Federal Environmental, Industrial and Nuclear Supervision Service's exercising the state function related to federal state civil construction supervision over the constructions and modernization of capital construction facilities, specified in item 5.1 of Article 6 of the Town-planning code of the Russian Federation, the federal state civil construction supervision is exercised directly by Rostekhnadzor territorial departments and interregional territorial departments for nuclear and radiation safety supervision, except the facilities which, in accordance with the decrees of the President of the Russian Federation, are to be supervised by other federal executive authorities. The Administrative Regulations were approved by Rostekhnadzor order No. 38 of January 31, 2013, registered by the Ministry of Justice of Russia of July 31, 2013 under number 29,225.

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In addition, state civil construction supervision is regulated by the following documents:

"Procedure of filing and record keeping while executing the state civil construction supervision", approved by Rostekhnadzor decree No. 1130 of December 26, 2006;

"Procedure of state construction supervision inspections and issuing certificates of conformance of built, reconstructed and repaired capital construction facilities with the requirements of technical regulations (codes and standards), other statutory norms and design documents", approved by Rostekhnadzor decree No. 1129 of December 26, 2006. According to item 2 of RF Government Decree No. 54 of February 1, 2006, "On state construction supervision in the Russian Federation", the Federal Environmental, Industrial and Nuclear Supervision Service is a federal executive body authorized to perform state construction supervision the during construction and reconstruction of the facilities specified in item 5.1 of Article 6 of the Town-planning code of the Russian Federation, which, in accordance with the decrees of the President of the Russian Federation, are to be supervised by other federal executive authorities. The number of engaged staffing positions, connected with the exercising of Rostekhnadzor civil state supervision, is 309. 248 of them are positions in territorial departments for industrial and environmental supervision, and the rest of them (61 positions) are in interregional territorial departments for nuclear and radiation safety supervision.

In 2013 the number of capital construction facilities, during the construction and modernization of which state civil construction supervision was exercised, was 15,564. Out of them, 60 ones were nuclear facilities.

Information on the number of facilities, during the construction and modernization of which state civil construction supervision was exercised, is provided in Table 100. In Table 100 the facilities are subdivided as per their type in accordance with RF legislation and their number is also given in percentage ratio to the total number of facilities.

Information on the number of facilities, during the construction and modernization of which state civil construction supervision was exercised, is provided in Table 100.

**Table 100**

<b>No.</b>	<b>Type of facilities under supervision</b>	<b>Number of supervised facilities</b>	<b>Number of supervised facilities, %</b>
1	Facilities, the construction and modernization of which is to be implemented at/in the following places:		
1.1	territories of two or more RF constituent entities;	230	1.48
1.2	RF continental shelf;	11	0.07
1.3	inland sea waters.	5	0.03
2	Defense and security facilities	59	0.38
3	Federal roads	299	1.92
4	Federal cultural heritage sites	32	0.21
5	Exceptionally hazardous, technically complex and unique facilities specified in Article 48.1 of the Town-Planning Code, namely:		
5.1	Nuclear facilities	60	0.39

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5.2	Hydraulic engineering structures of classes 1 and 2, installed in accordance with legislation on hydraulic engineering structure safety	82	0.53
5.3	Communication structures considered to be exceptionally hazardous, technically complex, as per RF legislation on communication	174	1.12
5.4	Space infrastructure facilities	19	0.12
5.5	Power transmission lines and other electrical supply network facilities under the voltage of 330 kV and more	174	1.12
5.6	Aircraft infrastructure facilities	191	1.22
5.7	Public railway transport infrastructure facilities	425	2.73
5.8	Underground railway	23	0.15
5.9	Sea ports except specialized ones designated for servicing sports and leisure boats	48	0.31
5.10	Thermal power plants with the power of 150 MWe or more	72	0.46
5.11	Hazardous industrial facilities subject to registration in the state register. as per RF legislation on industrial safety of hazardous industrial facilities	13,537	87.00
5.12	Unique facilities	84	0.54
6	Other facilities specified by RF Government	4	0.03
7	Facilities for the disposal and decontamination of waste of hazard classes I–V	31	0.20
<b>Total:</b>		<b>15,560</b>	<b>100</b>

Hazardous industrial facilities (HIF) subject to registration in the state register (as per RF legislation on HIF safety), make up the most, namely, 87 % of the total number of capital construction facilities during the construction and modernization of which state civil construction supervision is exercised.

Rostekhnadzor territorial departments for industrial and environmental supervision conducted 13,969 inspections of legal entities and individual entrepreneurs in the framework of state civil construction supervision. 82% of the inspections were conducted at facilities under construction; 18% - at facilities under reconstruction.

Interregional territorial departments for nuclear and radiation safety supervision of Rostekhnadzor conducted 118 inspections. 85% of the inspections were conducted at facilities under construction, 15% - at facilities under reconstruction.

Besides, Rostekhnadzor conducted 1,385 inspections in the framework of the fulfillment of the statements of order issued upon previous inspections. 45 inspections were conducted on the basis of imminent infliction of harm on the life and health of citizens, and damage to animals, plants, environment, cultural heritage sites (historical and cultural monuments) for the peoples of the Russian Federation, state security as well as natural and man-induced hazards. 1 inspection was conducted on the basis of the order (directive) of the head of the state control (supervision) body issued in accordance with the instructions of the President of the Russian Federation and the Government of the Russian Federation (in the scope of the fulfillment of the

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order of D.A. Medvedev, Prime Minister of the Russian Federation, DM-P9-7811 of December 20, 2013, issued upon the results of the meeting On the State and Development of Fuel and Energy Complex in North Caucasian Federal District).

Rostekhnadzor territorial departments for industrial and environmental supervision conducted 21 inspections in pursuance of prosecution bodies. The prosecution bodies received 70 applications on agreement upon the conduct of unscheduled in-situ inspections. 69 of the applications were forwarded by territorial departments for industrial and environmental supervision. 1 was sent by the interregional territorial department for nuclear and radiation safety supervision, namely, by Volga Interregional Territorial Department for supervision over nuclear and radiation safety.

During 4,777 inspections Rostekhnadzor revealed violations made by 2,071 legal entities and individual entrepreneurs, and issued 4,575 statements of order on the elimination of the violations of obligatory requirements. Rostekhnadzor territorial departments revealed 51,081 violations related to state civil construction supervision. 75 % of the violations were committed at facilities under construction; 25 % - at facilities under reconstruction. Basing upon the results of 3,107 inspections, suits on administrative malefactions were filed and 4,170 administrative penalties were imposed. The total number of imposed administrative penalties is 350,561.7 rubles.

Interregional territorial departments for nuclear and radiation safety supervision of Rostekhnadzor revealed 847 violations related to state civil construction supervision. 86 % of the violations were committed at facilities under construction; 14 % - at facilities under reconstruction. Basing upon the results of 24 inspections, suits on administrative malefactions were filed, and 94 administrative penalties were imposed. The amount of the imposed administrative fines totaled 9,320 rubles.

Activities of 4 organizations, involved in the construction and modernization of capital construction facilities, were suspended under court decisions made on the basis of Rostekhnadzor inspection results. Correspondingly, Rostekhnadzor issued 2 orders on activity suspension.

The main types of violations related to the construction and modernization of capital construction facilities were the following:

- deviations from the design documentation that was approved through state review;
- non-compliance with construction technology;
- implementation of construction and modernization without relevant permits;
- absence of design documentation approval obtained by state review and engineering survey results;
- as-built documentation is absent or drawn-up incorrectly (general, special work registers, hidden works acceptance reports, etc.);
- failure to meet the deadlines for submitting a notification on the start of construction;
- absence of certificates authorizing to implement activities impacting the safety of capital construction facilities, issued by a self-regulated organization;
- facility construction control is absent or inadequate;
- untimely notification about changes in the dates of the completion of work subject to inspection, or about the elimination of violations.

Rostekhnadzor territorial departments issued 7,715 conclusions on the conformity of capital construction facilities to the requirements of technical regulations (codes and standards), other regulatory legal acts and design documentation. 90 % of the conformity conclusions were issued to facilities under construction; 10 % - to facilities under reconstruction. Interregional territorial departments for nuclear and radiation safety supervision of Rostekhnadzor issued 9

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conclusions on the conformity of capital construction facilities to the requirements of technical regulations (codes and standards), other regulatory legal acts and design documentation. 6 conformity conclusions were issued to facilities under construction; 10 % - to facilities under reconstruction.

### **Environmental, sanitary and epidemiological and fire safety supervision during construction and modernization of capital construction facilities, exercised in the framework of state civil construction supervision**

State civil construction supervision in the Russian Federation includes state fire safety, sanitary and epidemiological and environmental supervision, in accordance with corresponding provision, approved by RF Government Decree No. 54 of February 1, 2006. In accordance with item 3 of the Decree of the President of the Russian Federation dated 23 June 2010 No.780 "Issues of the federal environmental, industrial and nuclear supervision service" and with the resolution of the Government of the Russian Federation dated 13th September 2010 No. 717 "On introduction of changes in some resolutions of the Government of the Russian Federation on the issues of authority of the Ministry of Natural Resources and Ecology of the Russian Federation, Federal Service for Supervision of Nature Resources, and Federal Environmental, Industrial and Nuclear Supervision Service", the functions of the Federal Environmental, Industrial and Nuclear Supervision Service, related to environment protection as regards the limitation of negative man-caused impact in the field of waste management and state environmental impact assessment, were delegated to the Federal Service for Supervision in the Sphere of Natural Resource Use.

As per current legislation, the functions, related to state environmental supervision are fulfilled by Rostekhnadzor only in the framework of construction supervision, in accordance with item 5 of the Provision on state civil construction supervision in the Russian Federation, approved by RF Government Decree No. 54 of February 1, 2006.

Thus, in accordance with item 5 of the above-mentioned Provision, within the framework of state civil construction supervision the state civil construction supervision body exercises state fire safety, sanitary and epidemiological, state supervision over facility compliance with energy efficiency requirements and the requirements for their equipping with devices for accounting of the energy resources consumed, as well as state environmental supervision except cases specified in the Town-Planning Code of the Russian Federation.

Whereas, calling to account for relevant violations (including violations of environmental safety legislation) is implemented in accordance with sanctions specified in Articles 9.4 and 9.5 of the Code of Administrative Offenses of the Russian Federation (KoAP RF) taken into account by state civil construction supervision bodies (including Rostekhnadzor).

In case any violation of legislative requirements for environmental safety is not covered by the scope of Rostekhnadzor state civil construction supervision functions, Rostekhnadzor forwards information about the violation to competent authorities in charge of relevant environmental supervision (in particular to Rosprirodnadzor, the Federal Service for Supervision in the Sphere of Natural Resource Use), according to the established procedure.

Rostekhnadzor territorial departments for industrial and environmental supervision revealed 1,763 violations of environmental legislation, 1,527 violations of sanitary and epidemiological legislation, 2014 violations of fire safety requirements in the framework of state civil construction supervision.

Interregional territorial departments for nuclear and radiation safety supervision of Rostekhnadzor revealed 45 violations of environmental legislation, 32 violations of sanitary and epidemiological legislation, 32 violations of fire safety requirements in the framework of state civil construction supervision.

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## **Participation in the "Program of construction of the Olympic facilities and Sochi town development as the skiing resort" in the framework of state civil construction supervision**

In accordance with the "Program of construction of the Olympic facilities and Sochi town development as the skiing resort" approved by RF Government Decree No.991 of December 29, 2007, (hereinafter referred to as the Program of Construction), state civil construction supervision is one of the most important and topical directions of Rostekhnadzor supervision activities in 2013. From the beginning of 2013 the total number of capital construction facilities constructed for Sochi XXII Olympic Winter Games and XI Paralympic Winter Games (hereinafter referred to as the Olympic Facilities) made up 136. By the end of the year new facilities were constructed and 166 Olympic Facilities were commissioned, thus, 88 Olympic Facilities were under supervision. In the process of federal state civil construction supervision much attention was paid to the prevention and suppression of violations of the requirements of technical regulations (codes and standards), regulatory legal acts and design documentation, committed by construction managers, subcontract organizations.

In 2013 661 Olympic facilities under construction were inspected in the framework of state civil construction supervision, namely, there were 440 inspections conducted as per inspection programs and at completed constructed facilities (278 inspections were held at the completed constructed facilities); and there were 221 unscheduled inspections (211 of them were held in the scope of statements of order).

During the inspections the whole spectrum of both gross and less significant violations of town-planning legislation and current construction codes and standards was revealed. 8,236 violations were revealed by Rostekhnadzor.

In order to eliminate the revealed violations, in 2013, 302 statements of order for elimination of the revealed violations and 31 statements of order for elimination of the causes and conditions, contributing to committing malefactions, were issued to the managers of various organizations participating in the construction of Olympic facilities.

Rostekhnadzor drew up 34 reports on failures to timely fulfill the legitimate statement of order of the body (official), exercising state civil construction supervision in accordance with part 6 of article 19.5 of the Code of Administrative Violations. Administrative cases on the violations were forwarded to the arbitrage, and relevant decision on calling the violators to account was made.

Following supervision activities implemented in 2013, 476 administrative cases were opened, 327 of them - against juridical persons, and 149 - against officials.

Most of the administrative cases deal with administrative violations prescribed in Article 9.4 of RF Code of Administrative Violations "Violation of obligatory requirements for construction and application of construction materials".

63 administrative violations were revealed at the Olympic Facilities in 2013. Administrative responsibility for the violations is prescribed in Article 9.5 of RF Code of Administrative Violations "Violation of the established procedure of construction, modernization, capital repair of a capital construction facility, and its commissioning". 49 violators were called to account for implementing construction without relevant permit, as per Part 1 of the mentioned article.

4 legal entities were brought to administrative responsibility in 2013 as per Article 9.5.1 of RF Code of Administrative Violations "Implementation of activities impacting the safety of capital construction facilities without relevant permit of a self-regulated organization".

As a result of legal administrative investigation of the mentioned violations, the sum of fines imposed in 2013 amounted to 29,809 rubles.

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The sum of fines imposed on the Olympic Facilities in 2013 made up 22 100 rubles.

14 organizations were brought to administrative responsibility in accordance with Part 1 of Article 20.25 of RF Code of Administrative Violations "Failure to pay administrative fines in due time". All the previously imposed fines, for which there were no court decisions on fine cancellation or fine amount reduction, were fully paid.

The most typical violations revealed are the following:

failure to notify the state civil construction supervision body about the start of works and the completion dates of works subject to inspection on time; absence of permits for construction, absence of a favorable state design review conclusion, absence of a favorable conclusion of the state environmental impact assessment;

absence of working documentation, including work procedure reports, developed and approved according to the established procedure;

construction control is absent or inadequate;

failure to fulfill obligatory requirements for the maintenance of as-built documentation, general, special work registers;

failure to eliminate violations in accordance with statements of order;

violation of design documentation requirements;

violations of the requirements of safety and labor protection instructions.

8 violations of RF legislation regarding fire safety, 9 violations of RF legislation regarding sanitary epidemiological welfare and 19 violations of RF legislation regarding environment protection were revealed during state civil construction supervision over constructed Olympic Facilities in 2013. Relevant administrative cases were opened dealing with Articles 6.3, 8.1, 8.2, 8.4, 8.21, 20.4 of RF Code of Administrative Violations.

Rostekhnadzor issued 166 conclusions on the conformity of completed capital construction facilities, namely, the Olympic Facilities, to the requirements of technical regulations (codes and standards), other regulatory legal acts and design documentation in 2013.

Rostekhnadzor involved 175 inspectors from territorial departments for industrial and environmental supervision in order to enhance the quality of supervision under the conditions of fast pace construction, and to perform the examination of constructed facilities and the quality of applied materials more extensively and thoroughly.

### **Supervision over Activities of the Self-Regulated Organizations in the Field of Engineering Surveys, Civil-Constion and Architectural Design, Construction, Modernization, Overhaul of the Capital Construction Facilities, as well as Keeping the State Register of the Indicated Organizations**

Supervision over the activities of self-regulated organizations in the field of engineering surveys, architectural and building design, construction, modernization, overhaul of the capital construction facilities, as well as maintenance of the state register of the self-regulated organizations are implemented by the Federal Environmental, Industrial and Nuclear Supervision Service of Russia on the basis and in accordance with the Town-planning code of the Russian Federation, Federal Law No. 315-FZ of December 1, 2007 "On self-regulated organizations", Federal Law No.7-FZ of January 12, 1996 "On non-commercial organizations", Federal Law No. 210-FZ of July 27, 2010 "On arrangement of state and municipal services rendering", RF Government Decree No.724 of September 29, 2008 "On the approval of the procedure of self-regulated organization register maintenance".

As of January 1, 2014 497 self-regulated organizations are registered in the state register of self-regulated organizations. 39 of the registered self-regulated organizations are based on the membership of persons performing engineering surveys, 188 are engaged in preparation of the design documentation, 270 - in construction activities.

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25 self-regulated organizations were registered in the state register of self-regulated organizations in 2013. 1 of them is based on the membership of persons performing engineering surveys, 9 are engaged in preparation of the design documentation, 15 - in construction activities. In 2013 self-regulated organizations forwarded more than 25,000 notifications on the introduction of changes into the data of the state register of self-regulated organizations. More than 5,200 extracts from the State register of self-regulated organizations were issued.

Upon the results of the consideration of the notifications sent by self-regulated organizations concerning the introduction of changes into the data of the state register of self-regulated organizations, Rostekhnadzor Headquarters forwarded more than 500 prescriptive letters on elimination on violations of legislation in the field of self-regulation in 2013, in particular the letters deal with the following violations:

notifications were not sent in due time set by Part 3 of Article 55.17 of the Town-planning code of the Russian Federation and item 1 of Part 3 of Article 22 of Federal Law No. 315-FZ of December 1, 2007 "On self-regulated organizations";

absence of data on the authorities of persons signing the notifications of self-regulated organizations on the introduction of changes into the data of the state register of self-regulated organizations;

absence of an electronic up-to-date register of self-regulated organization membership, which is the violation of the requirements of Part 14 of Article 55.5 and Part 3 of Article 55.17 of the Town-planning Code of the Russian Federation.

In order to enhance informational transparency Rostekhnadzor carries out activities on the automation of state service of the maintenance of the state register of self-regulated organizations.

In 2013 8 self-regulated organizations were inspected in the framework of control and supervision measures, which makes up 2 % of the total amount of self-regulated organizations registered in the state register.

18 violations of the requirements of self-regulation legislation were revealed during the inspections held in 2013.

The main violations of self-regulation legislation revealed during the inspections deal with the following:

violations concerning the formation and allocation of the indemnification fund; violations of qualification requirements during the issue of authorization certificates;

a self-regulated organization failed to control the fulfillment of the requirements of technical regulations by its members during construction, modernization and overhaul of capital construction facilities;

violation of the procedure of enrollment into the membership of a self-regulated organization;

absence of fee payment or partial fee contribution into the indemnification fund, payment of fee contribution into the indemnification fund by third parties;

issue of authorization certificates without available insurance agreement; violations dealing with posting information about the activities of self-regulated organizations and their members on the Internet.

In the framework of supervision over the activities of self-regulated organizations Rostekhnadzor issued order No.Pr-195 of May 7, 2013 "On the arrangement of supervision over the activity of self-regulated organizations related to engineering survey, constructions, modernization and overhaul of capital construction facilities in the Federal Environmental, Industrial and Nuclear Supervision Service of Russia". In the middle of 2013 the Department of the State Civil Construction Supervision of Rostekhnadzor Headquarters held a webinar meeting (an online meeting through the Internet) with the personnel of Rostekhnadzor territorial departments in order to explain the specific features of the implementation of state

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supervision over self-regulated organizations.

In October, 2013, the Department of the State Civil Construction Supervision of Rostekhnadzor Headquarters took part in a training webinar workshop arranged for Rostekhnadzor territorial departments. The workshop was dedicated to the subsystem Supervision Activity of the Integrated Information System of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia regarding supervision over self-regulated organization activities in the field of engineering surveys, civil-structural and architectural design, construction, modernization, overhaul of capital construction facilities.

Rostekhnadzor developed the Administrative regulation for exercising state supervision over the activities of self-regulated organizations in the field of engineering surveys, civil-structural and architectural design, construction, modernization, overhaul of capital construction facilities, to be applied for the implementation of relevant activities.

The Administrative regulation was approved by Rostekhnadzor Order No.325 of July 25, 2013, registered under number 31219 by the Ministry of Justice of Russia on February 4, 2014.

Rostekhnadzor developed draft Administrative regulation for rendering services related to the maintenance of the state register of self-regulated organizations in the field of engineering surveys, architectural and building design, construction, modernization, overhaul of the capital construction facilities.

### ***2.3. Organization and Results of Review***

#### ***2.3.1. Safety Review of Nuclear Facilities***

##### **Legal bases, purpose and lines of safety review (safety analysis review) of nuclear facilities and (or) kinds of activities in the field of atomic energy use. Arrangement and functioning of the review system**

Safety review (safety analysis review) in the framework of the licensing procedure conducted by Rostekhnadzor in the field of atomic energy use is intended to assess the safety analysis submitted by a license applicant or license holder (licensee) (hereinafter referred to as applicant) for a nuclear facility (nuclear installation, radiation source, nuclear materials, radiation substances, radioactive waste storage facility, etc.), information of its actual status, safety analysis of the declared type of activity in the field of atomic energy use for conformity with the legislation of the Russian Federation, codes and standards in the field of atomic energy use, state of the art scientific, technical and industrial developments. Safety review serves to assess completeness of the technical and administrative measures envisaged by the applicant to ensure nuclear and radiation safety during the activity applied for.

The need in conducting of the safety review in atomic energy use is set forth by:

the Federal Law of 21 November 1995 No. 170-FZ On Atomic Energy Use;

Provision on Licensing in the Field of Use of Atomic Energy which was adopted by Decree No. 280 of the Government of the Russian Federation dated March 29, 2013.

Informative and organizational aspects related to safety review are established by Administrative regulations for the Federal Environmental, Industrial and Nuclear Supervision Service to perform its state function of licensing activities in the field of use of nuclear energy" approved by Order No. 262 dated October 16, 2008, of the Ministry of Natural Resources and Environment of the Russian Federation (hereinafter referred to as the Administrative Regulations).

Each safety review is conducted by one of expert organizations in accordance with Rostekhnadzor's requirements specification, which includes topical questions of review,

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requirements for the expert review report and its submission to Rostekhnadzor, and also a list of the applicant's documents to be reviewed.

The documents, that substantiate the safety of nuclear facilities and (or) nuclear activities applied for and include data on the actual state of nuclear facilities, submitted to Rostekhnadzor together with application for a license, its renewal (renewal of license terms and conditions) are subject to safety review. Requirements for the content and composition of these documents are established by the Administrative Regulations.

Safety review is conducted by the expert organizations holding Rostekhnadzor licenses for the right to conduct safety reviews (safety analysis reviews) of nuclear facilities and (or) types of activities in the field of atomic energy use. According to the Administrative Regulations information about the expert review companies having relevant licenses of Rostekhnadzor is placed on the Internet site [www.gosnadzor.ru](http://www.gosnadzor.ru). Applicants select an expert organization from those holding appropriate Rostekhnadzor licenses.

The persons that were involved in the preparation of the documents submitted to Rostekhnadzor by the applicant to justify safety assurance of the nuclear facility and (or) type of activity in the field of atomic energy use cannot be employed for the expert review. In case the documents to be reviewed contain the information constituting state secret, such documents are reviewed by the expert organizations that have the right to work with such information. Basing on the results of safety review the expert organization makes an expert review report on safety analysis of the nuclear facility and (or) types of activities in the field of atomic energy use. The expert review report is approved by the head of the expert organization, certified by the organization's stamp and submitted to Rostekhnadzor, where it is assessed for compliance with the requirements specification for the review, and after that Rostekhnadzor sends a written notice to the expert organization about acceptance or refusal of the expert review report. The date of review completion is the date of written notice given by Rostekhnadzor about acceptance of the expert review report.

The system of safety review acting in Rostekhnadzor is an entirety of review process, technical experts, assessment rules and assessment criteria, methods and instruments used in the course of review. Rostekhnadzor controls the safety review system through development of regulatory documents and safety guides; issuing licenses for the right to conduct expert review to organizations; regular efficiency assessment of the safety review system; arrangement of scientific survey for development of review methods; organization of data bases for nuclear facilities; taking into account international experience in conducting safety reviews.

### **Summary of Nuclear Facilities Safety Review in 2013**

Safety reviews arranged by the Department for Safety Regulation of Nuclear Power Plants and Nuclear Research Facilities (Department 5). The following expert organizations took part in the safety reviews:

JSC NC Tehexpertisa (Moscow, License No.GN-13-101-2729 of 15.05.2013); LLC Institute of Cytology of the Russian Academy of Sciences (St. Petersburg, License No.GN-13-108-2589 of 06.02.2012); STC INTEK (Moscow, License No. GN-13-101-2733 of 27.05.2012); LLC TsEB (Moscow, License No.GN-13-101-2631 of 15.06.2012); STC MATEK (Obninsk, License No.GN-13-115-2608 of 02.04.2012);

LLC Luna-Mars (Moscow, License No.GN-13-108-1993 of 28.01.2009); FSUE VO "Safety" (Moscow, License No.GN-13-101-2449 of 29.10.2010); LLC REScenter (St. Petersburg, license No.GN-13-115-2652 of 29.08.2012); LLC INTsEB (Ufa, license No.GN-13-101-2076

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of 16.03.2009);

LLC TsEB (St. Petersburg, License No. GN-13-101-2631 of 15.06.2012);

LLC NITsYaT (Nizhniy Novgorod, License No. GN-13-101-1982 of 11.05.2009);

LLC Expert (Volgodonsk, License No. GN-13-101-2745 of 17.06.2013).

Total number of arranged safety reviews and expert review reports considered by Department 5 in 2013 is 243. 205 of them were conducted by FBE SEC NRS (information about expert activity of FBE SEC NRS is provided below). The other 38 expert review reports on activity types deal with the following:

designing and engineering of nuclear installations - 12;

conduct of safety reviews of nuclear facilities and (or) activities in the field of atomic energy use — 14;

operation of nuclear facilities and nuclear material storage facilities — 6;

use of nuclear materials and (or) radioactive substances in research and development — 1;

design and manufacture of equipment for nuclear installations — 5.

Safety reviews arranged by the Department for Safety Regulation  
of Nuclear Fuel Cycle Facilities, Nuclear Energy Installations of Ships and Radiation  
Hazardous Facilities (Department 6).

In 2013 Department 6 engaged the following expert organizations, having relevant Rostekhnadzor licenses, in safety review:

FBE SEC NRS (Moscow, License No. GN-13-101-2534 of 12.07.2011);

LLC REScenter (St. Petersburg, license No. GN-13-115-2652 of 29.08.2012,

No. GN-13-205-2654 of 30.08.2012, No. GN-13-102-2547 of 01.10.2011);

LLC MATEK (Obninsk, Kaluga region, License No. GN-13-115-2609 of 02.04.2012);

LLC Expert-Atom (Balakovo, Saratov region, License No. GN-13-205-2533 of 07.07.2011);

LLC Atomexpert24 (Moscow, License No. GN-13-101-2549 of 12.10.2011);

LLC AtomVoinExpert (Moscow, License No. GN-13-205-1881 of 15.07.2008 till 01.08.2013);

LLC IITsEB (Moscow, License No. GN-13-115-2701 of 25.01.2013);

JSC NC Tehexpertisa (Moscow, License No. GN-13-115-2562 of 30.11.2011);

LLC Regional Technologies (Moscow region, Mytishi, License

No. GN-13-205-2239 of 29.12.2009);

LLC Institute of Cytology of the Russian Academy of Sciences (St. Petersburg, License No. GN-13-115-2672 of 31.10.2012, GN-13-108-2589 of 06.02.2012, GN-13-102-2615 of 30.04.2012);

TMC NRS NEI (Moscow, License No. GN-13-101-2134 of 15.06.2009);

NP NIIE (Moscow region, Sergiev Posad, License No. GN-13-115-2420 of 15.09.2010);

LLC STC INTEK (Moscow, License No. GN-13-101-2733 of 27.05.2013).

85 safety reviews were conducted, 12 of them were conducted by FBE SEC NRS (information on FBE SEC NRS expert activity is given below). 73 safety reviews conducted by other expert organizations dealt with the following:

- designing and engineering of radiation sources;

- safety review (safety analysis review) of nuclear facilities and (or) kinds of activities in the field of atomic energy use;

3 - design of nuclear material and radioactive substance storage facilities, radwaste storage facilities;

17 - design and construction of nuclear facilities, radioactive sources, nuclear material and radioactive substance storage facilities, radioactive waste storage facilities;

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5 - design of equipment;

1 - operation of a complex containing radioactive substances;

1 - operation of a radioactive substance storage facility;

1 - operation of a nuclear material storage facility;

6 - operation of nuclear installations;

1- location of nuclear installations;

3- construction of nuclear installations;

1 - management of radioactive materials and radioactive substances, also in production, use, processing, transportation and storage of nuclear materials and radioactive substances;

1 - design and manufacture of equipment for radioactive waste storage facilities;

3- design and manufacture of equipment;

2 - radioactive waste management during their storage, reprocessing, transportation;

4 - use of nuclear material and/or radioactive substances in research and development;

2 - construction decommissioning;

2 - siting, construction, operation and decommissioning of nuclear facilities, radiation sources, nuclear material and radioactive substance storage facilities.

In 2013, basing on the results of conducted reviews, Department 6 decided to refuse the issue of a license for radiation source design for LLC Radiopreparat.

#### Safety reviews arranged by the Department of special safety (Department 15).

In 2013 Department 15 engaged the following expert organizations, having relevant Rostekhnadzor licenses, in safety review: JSC NC Tehexpertisa (Moscow, License No.GN-13-115-2562 of 30.11.2011);

LLC Atomexpert24 (Moscow, License No. GN-13-101-2549 of 12.10.2011).

3 safety reviews of activities in the field of atomic energy use were conducted, which dealt with the following (regarding physical protection):

design and construction of nuclear installations, radioactive sources, nuclear material and radioactive substance storage facilities, radioactive waste storage facilities - 1;

designing and engineering of nuclear installations - 1; design of radiation sources -1.

#### Safety review in Interregional Territorial Departments for Nuclear and Radiation Safety Supervision.

In 2013 the Interregional Territorial Departments on nuclear and radiation safety supervision (hereinafter referred to as the ITD NRS) in the framework of fulfillment of the state function of licensing the activity in the field of atomic energy use organized reviews of the documents provided by the organizations that filed applications for licenses or amendments to license conditions. The number of expert review reports prepared by expert organizations and reviewed by the ITD NRS totaled 1,308. Information on the activity of each ITD NRS is provided below.

#### Safety review in Volga ITD NRS.

In 2013 the following expert organizations, having relevant Rostekhnadzor licenses, took part in safety review:

LLC REScenter (St. Petersburg, license No.GN-13-205-1694 of 09.07.2007,

No. GN-13-101-1790 of 14.01.2008, No. GN-13-102-1566 of 10.12.2006, No. Gn-13-115-

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2652 of 29.08.2012);

LLC Safety Review Center (Moscow, License No. GN-13-101-2631 of 15.06.2012);

LLC NETsYaT (Nizhniy Novgorod, License No. Gn-13-101-1982 of 11.01.2009);

JSC NC Tehexpertisa (Moscow, License No. GN-13-115-2562 of 30.11.2011,

No. GN-13-101-2729 of 15.05.2013);

LLC Radiation and Ecological Control (Orenburg, License No. GN-13-205-2664 of 02.10.2012);

LLC Expert-Atom (Saratov region, Balakovo, License No. TsO-03-101- 5884 of 21.02.2011, No. GN-13-205-2533 of 07.07.2011, No. GN-13-101-2291 of 19.02.2010);

LLC Atomexpert24 (Moscow, License No. GN-13-101-2549 of 12.10.2011);

LLC Engineering Center of the Russian Academy of Sciences (St. Petersburg, License No. GN-13-101-2645 of 31.07.2012; No. GN-13-102-2615 of 30.04.2012;

No. GN-13-108-2589 of 06.02.2012;

No. GN-13-115-2672 of 31.10.2012);

LLC RESOURCE (Voronezh, License DO-03-101-1871 of 31.05.2012).

149 safety reviews of the following activities were conducted in 2013:

design of equipment for NPPs - 27;

design and engineering of a nuclear installation regarding separate buildings and constructions, other systems of the nuclear installation (NPP unit) -4;

design of equipment for nuclear fuel cycle facilities - 1; design of equipment for research nuclear installations - 1; design of equipment for nuclear installations of ships and other floating vessels - 1;

manufacture of equipment for NPPs - 36;

manufacture of equipment for nuclear fuel cycle facilities - 7;

manufacture of equipment for ships and other floating vessels - 2;

manufacture of equipment for radiation hazardous facilities - 1;

operation of a nuclear installation regarding the implementation of activities and rendering services for the operating organization - 25;

construction of nuclear installations regarding the implementation of activities and rendering services to the operating organization - 13;

construction of radiation sources regarding the implementation of activities and rendering services to the operating organization - 1;

construction of NPPs regarding the implementation of activities and rendering services to the operating organization - 3;

construction of radwaste storage facilities regarding the implementation of activities and rendering services to the operating organization - 2;

operation of a radiation source -26;

operation of a stationary facility or a construction located outside the territory of a nuclear installation or a radiation source of regional scale designed for storage of radioactive waste - 1;

operation of a stationary facility or a construction designated for radwaste disposal, regarding the implementation of activities and rendering services to the operating organization - 1;

radioactive waste management regarding the implementation of activities and rendering services to the operating organization - 1.

In 2013, basing upon review results, Volga ITD NRS did not decline any issue of licenses.

#### Safety review in the ITD NRS for Siberia and the Far East.

In 2013 the following expert organizations, having relevant Rostekhnadzor licenses, took part in safety review:

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LLC REScenter, St. Petersburg;

JSC NC Tehexpertisa, Moscow;

LLC MATEK, Kaluga region, Obninsk;

FSUE VO "Safety", Moscow;

Independent noncommercial organization Training and Technical center "Safety", Novosibirsk;

FSUE Federal Center for Design and Development of Nuclear Management Facilities;

LLC Atomexpert 24, Moscow.

121 safety reviews of the following activities were conducted in 2013: 2 - design (engineering) of separate buildings and constructions, systems and components of nuclear installations, radiation sources, nuclear material and radioactive substance storage facilities;

5 - documents substantiating the safety activity related to the design of equipment for nuclear installations, radiation sources, nuclear material and radioactive substance storage facilities;

21 - documents substantiating the safety activity related to the design and manufacture of equipment for nuclear installations, radiation sources, nuclear material and radioactive substance storage facilities;

32 - documents substantiating the safety of radiation sources operation;

49 - documents substantiating the safety of activities during construction, operation and decommissioning of nuclear installations, radiation sources, nuclear material and radiation substance storage facilities, radwaste storage facilities, regarding the implementation of activities and rendering of services in the field of atomic energy use;

6 - documents substantiating the safety of activities during construction, operation of nuclear installations (NPP units), nuclear material and radiation substance storage facilities, regarding the implementation of activities and rendering of services in the field of atomic energy use;

2 - documents substantiating the safety of activities during construction, operation of stationary radiation sources, regarding the implementation of activities and rendering of services in the field of atomic energy use;

1 - document substantiating the safety of activities during radioactive substances transportation;

1 - document substantiating the safety of activities during radioactive substances treatment and storage;

1 - document substantiating the safety of activities during radwaste management regarding the implementation of activities and rendering of services in the field of atomic energy use.

### Safety review in Don ITD NRS

In 2013 the review of substantiating documents was conducted by the following expert organizations chosen by the applicant and having relevant licenses of Rostekhnadzor: LLC Engineering Center Expert (Rostov region, Volgodonsk; License No.GN-13-101-2745 of 17.06.2013);

Enterprise for Production Equipment Operability Assurance LLC RESOURCE (Voronezh, License No. GN-13-101-2618 of 10.05.2012);

Expert and Consulting Enterprise LLC Energoatom (Voronezh, License No.GN-13-205-2699 of 24.01.2013);

LLC AtomVoinExpert (Moscow, License No.GN-13-205-1881 of 15.07.2008);

LLC Expert-Atom (Saratovskaya oblast, Balakovo, License No.GN-13-205-2533 of 07.07.2011, No. GN-13-101-2291 of 19.02.2010);

LLC Interindustry expert and certification, scientific technical and control center of nuclear and radiation safety (REScenter) (Saint Petersburg, License No.GN-13-205-2654 of 30.08.2012, No. GN-13-115-2652 of 29.08.2012, No. GN-13-101-1790 of 14.01.2008, No. GN-13-102-2547 of 01.10.2011);

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LLC Safety Review Center (Moscow, License No. GN-13-101-2631 of 15.06.2012);  
LLC Radiation and Ecological Control (Orenburg, License No. GN-13- 205-2664 of 02.10.2012).

LLC Atomexpert24 (Moscow, License No. GN-13-101-2549 of 12.10.2011);

LLC Safety Review Engineering and Research Center (Moscow, License No. GN-13-101-2076 of 16.03.2009); FSUE Federal Center for Design and Development of Nuclear Management Facilities of the Federal Medical and Biological Agency of Russia (Moscow, License No. GN-13-205-2508 of 15.04.2011); NP Scientific and Research Institute of engineering ecology (Moskovskaya oblast, Sergiev Posad, License No. GN-13-115-2420 of 15.09.2010).

In 2013 Don ITD for NRS supervision of Rostekhnadzor arranged 103 safety reviews, including the following:

77 reviews of documents substantiating the radiation safety of radiation sources and radioactive substance storage facility, as well as the activity related to construction, operation and decommissioning of nuclear installations, a stationary object designated for nuclear material storage and radwaste storage facilities, regarding the implementation of activities and rendering of services for the operating organization (JSC ElectroSroyMontazh, Voronezh, LLC Repair and Construction Company Panorama, Enterprise for Production Equipment Operability Assurance LLC RESOURCE, LLC Advanced Engineering Institute, LLC Apatity Construction Department- 1, JSC Yugelektro-4, JSC Volgodonsk Engineering and technical Center of Radiation Control, LLC Donresource, LLC Construction and Installation Enterprise-731, LLC Mounting Department No.4 of Elektrosevkavmontage Corporation, LLC EnergoTechAtom, LLC Impulse, LLC Comfort-Service, LLC Production and Construction Company Universalstroy, LLC Kola NPP-Auto, LLC ENERGOTECHSERVICE Company Group, LLC SroyTechSystema, JSC Trade Company Metallist, LLC Volgodonsk Mounting Department, ENEKS (JSC), JSC Energotechservice, LLC Energostroyexpertisa, LLC AlfaManagementGroup, LLC DonElektroService, LLC Techstroyprom, LLC Production Company Status, LLC Electric Installation Department No.7, Budgetary Health Institution Voronezh Regional Clinical Oncology Center, Federal Budgetary Enterprise State Regional Center of Standardization, Metrology and Testing of Rostov Region, LLC Medial, Federal Budgetary Enterprise Rostov Scientific and Research Oncology Institute of the Ministry of Healthcare of the Russian Federation, LLC Gazprom dobycha Astrakhan, State Budgetary Healthcare Enterprise Clinical Oncology Center No.1 of

the Ministry of Healthcare of Krasnodar Region, Federal Budgetary Enterprise State Regional Center of Standardization, Metrology and Testing of Krasnodar Region, LLC KoronaDental, Federal Budgetary Enterprise State Regional Center of Standardization, Metrology and Testing of Voronezh Region, JSC Nevinnomysskiy Azot, JSC Taganrog Boilermaking Factory Krasniy Kotelshik, LLC Radioisotope equipment - Service, JSC Krasnodargasstroy, Federal State-Owned Enterprise 1602 Military Clinical Hospital of the Ministry of Defense of the Russian Federation, State Budgetary Healthcare Enterprise Oncology Center No.2 of the Ministry of Healthcare of Krasnodar Region, LLC Alex-Plus);

2 reviews of documents substantiating the activity related to the design of nuclear installations regarding the implementation of activities and rendering services for the operating organization (LLC Inzhzashita, LLC Radiant);

24 reviews of documents substantiating the activity related to the design and manufacture of equipment for nuclear installations, radwaste storage facilities (JSC Prom-Energo-Komplekt, JSC Scientific and Production Company Etalon, LLC Scientific and Technical Firm



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ENERGOMASH-engineering, JSC Vodmashoborudovaniye Plant, LLC Elektropult-Grozniy, LLC Southern Construction Company, LLC Production Complex Kosmos-Neft-Gas, LLC Tsymlyansk Machine Engineering Plant, LLC Karbofer Metsservice, LLC Rimetalk, LLC Voronezh-StroyMet, JSC Volgograd Metallurgic Plant Krasniy Oktyabr, LLC ATOMRESINOKOMPLEKT, LLC Engineering Bureau of Voronezh Aircraft Manufacturing Stock Company, JSC Pyatigorsk Plant Impulse). In 2013 upon the results of the reviews Don ITD for NRS supervision of Rostekhnadzor denied the issue of 2 licenses (for JSC Vodmashoborudovaniye Plant, that applied for licenses related to the design and manufacture of equipment for radwaste storage). Ground for the denial: expert review reports include conclusions according to which the safety of the licensed activity types is not assured and the documents submitted with application for the licenses and substantiating the safety of the activities do not comply with the requirements of the federal codes and standards in the field of atomic energy use.

### Safety review in North-European NRS ITD.

In 2013 the following expert organizations, having relevant licenses of Rostekhnadzor, took part in the review of documents substantiating the activity applied for:

Limited Liability Company Interindustry expert and certification, scientific technical and control center of nuclear and radiation safety (REScenter), Saint Petersburg,

LLC Engineering Center of the Russian Academy of Sciences, Saint Petersburg;

JSC NC Tehexpertisa, Saint Petersburg;

LLC Scientific and Technical Review Center, Saint Petersburg;

LLC MEK, Saint Petersburg;

Federal State Unitary Enterprise Central Research Institute of Structural Materials PROMETHEY (FSUE TsNII KM Prometey), Saint Petersburg;

LLC Specialised Installation and Adjustment Department KVARs, Saint Petersburg;

LLC Atomexpert24, Moscow;

Federal Budgetary Enterprise 33 Central Scientific and Research Testing Institute (FBU TsNIII MO RF), Saratov region, Volsk-18.

In 2013 there were 244 reviews of documents substantiating the safety of the activity applied for (during licensing), including the following:

documents substantiating NPP activities related to the following (total number - 80):

siting of nuclear installations, regarding the implementation of activities and rendering services to operating organizations - 1;

construction of nuclear installations regarding the implementation of activities and rendering services to operating organizations - 49;

operation of nuclear installations, regarding the implementation of activities and rendering services to operating organizations - 27;

decommissioning of nuclear installations, regarding the implementation of activities and rendering services to operating organizations - 1;

radioactive substance management -1; radwaste management -1;

documents substantiating NI activities related to the following (total number - 9):

construction of nuclear installations regarding the implementation of activities and rendering services to operating organizations - 1;

operation of nuclear installations, regarding the implementation of activities and rendering services to operating organizations - 8;

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documents substantiating fuel cycle facility and object activities related to the following (total number - 2):

operation of a nuclear installation regarding the implementation of activities and rendering services to operating organizations - 1;

decommissioning of a radiation source - 1; documents substantiating the safety of activities at nuclear power installations of vessels and other offshore facilities (total number - 4): operation of a nuclear installation regarding the implementation of activities and rendering services to operating organizations - 2;

decommissioning of a radiation source (vessel categorized as a radiation source) - 1; radwaste management - 1;

documents substantiating activities at radiation hazardous facilities, related to the following (total number - 32):

construction of a radiation source - 5;

operation of a radiation source - 22;

radioactive substance management during transportation and storage-1; radioactive substance management -1;

radwaste management - 3;

documents substantiating the activity applied for by organizations (total number - 104):

design - 13 (without the consideration of documents substantiating design and engineering of physical protection systems, see below);

design - 39;

manufacture of equipment for nuclear facilities - 52 (LLC Inform, LLC Rakurs, FSUE A.P.Alexandrov NITI , LLC NIIEFA-ENERGO, LLC Spetsproyekt, LLC Riton, LLC Gorizont. Pilot-Production Plant No.1, LLC Renovation and Shipbuilding, JSC Vostok, LLC Spetstechkomplekt, LLC Firm Parsek, etc.);

documents substantiating the activity applied for related to the design and engineering of physical protection systems of nuclear facilities, implementation of activities and rendering services related to installation, adjustment, repair of physical protection systems (total number - 13):

design and engineering of nuclear installations, radioactive sources, nuclear material storage facilities and radioactive substance storage facilities, radwaste storage facilities (engineering and technical service of physical protection system) - 5;

operation of nuclear installations, radioactive sources, nuclear material storage facilities and radioactive substance storage facilities, radwaste storage facilities regarding the implementation of activities and rendering of services for the operating organization - 5;

construction of nuclear installations, radioactive sources, nuclear material storage facilities and radioactive substance storage facilities, radwaste storage facilities regarding the implementation of activities and rendering of services for the operating organization - 3.

In 2013 the North-European ITD forwarded three expert review reports made by LLC Atomexpert24 to the expert organization for rework, because the reports did not comply with the requirements of technical specification for review conduct. One expert review report was approved after rework, the other two were forwarded to the expert organization for rework three times (review of the documents of LLC Spetsstroy-SPb UNR 302, substantiating the activity applied for related to NPP construction, and NPP operation), and were not approved as of the end of the reporting period.

Basing on the results of reviews, 5 decisions to deny the issue of the following licenses were made:

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- for engineering of equipment as per LLC PIB Element (due to the fact that the enterprise refused further consideration of the application); LLC Renovation and Shipbuilding (due to contradictory information revealed and insufficient substantiation of the preparedness of the enterprise to fulfill the requirements of regulations during the implementation of activities applied for);

- for the manufacture of equipment as per the applications of LLC Renovation and Shipbuilding, LLC ITC Co., JSC NPF TsKBA, due to contradictory information revealed and insufficient substantiation of the preparedness of the enterprise to fulfill the requirements of regulations during the implementation of activities applied for.

In 2013 reviews of the following licensee documents substantiating changes in License Validity Terms and Conditions were conducted:

operation of a radiation sources -14;

engineering and manufacture of equipment for nuclear facilities - 15.

#### Safety review in Ural NRS ITD.

The following expert organizations, having relevant Rostekhnadzor licenses, took part in safety review: ANO Expertisa (Licenses No.GN-13-205-1945 of 05.12.2008, No. GN-13-101-2461 of 06.12.2010, GN-13-115-2398 of 16.07.2010);

LLC Expertisa (Licenses No.GN-13-101-2741 of 14.06.2013, No. GN-13-115- 2718 of 05.04.2013, GN-13-205-2710 of 05.03.2013);

LLC Uralrescenter (Licensee No.GN-13- 205-2644 of 26.07.2012, No. GN-13-115- 2497 of 15.11.2007);

LLC RIP (License No.GN-13-205-2459 of 02.12.2011);

LLC Atomexpert24 (License No. GN-13-101-2549 of 12.10.2011).

During the reporting period Ural NRS ITD arranged 129 safety reviews, including the following:

33 reviews of documents substantiating the safety of the activities of organizations rendering services at NPPs;

18 reviews of documents substantiating the safety of the activities of organizations rendering services at nuclear fuel cycle facilities;

32 reviews of documents substantiating the safety of operation and use of radiation hazardous facilities;

17 reviews of documents substantiating the safety of organization activities related to the design of equipment for nuclear facilities;

29 reviews of documents substantiating the safety of organization activities related to the manufacture of equipment for nuclear facilities;

1 review of documents substantiating the safety of organization activities related to the design of nuclear facilities.

In 2013 Ural ITD made two decisions denying the issue of licenses, basing on the results of reviews conducted as per the applications of LLC NPP INNOTECh and LLC Perfos-A.

#### Safety review in Central NRS ITD.

In 2013 Central ITD engaged the following expert organizations, having relevant Rostekhnadzor licenses, in safety review:

LLC MATEK; JSC NC Tehexpertisa; LLC TsEB; LLC STC INTEK;

LLC Atomexpert24; LLC Engineering Center of the Russian Academy of Sciences; LLC Regional Technologies; LLC «New ecological technologies»; LLC AtomVoinExpert; JSC Center for Analysis and Review of Multipurpose Safe Structures,

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JSC TsAE-MBK; LLC Luna-Mars; LLC REScenter; JSC Ecoculture Technologies; JSC TekK; JSC VNIIAES; LLC ITsES; SFSI 33 TsNIII of Russian Ministry of Defense; JSC Ecoculture Technologies; Non-commercial Partnership Scientific and Research Institute of Engineering Ecology.

During the reporting period Central NRS ITD arranged 568 reviews of documents substantiating the safety of nuclear facilities and relevant activities, including the following:

review of documents substantiating the safety of construction of the facility where the licensed type of activity is to be performed (including rendering of services) - 133;

review of documents substantiating the safety of operation of the facility where the licensed type of activity is to be performed (including rendering of services) - 128;

review of documents substantiating the safety of decommissioning of the facility where the licensed type of activity is to be performed (including rendering of services) - 11; review of documents substantiating the safety of nuclear material

management (including rendering of services) - 2;

review of documents substantiating the safety of radioactive substance management - 8; review of documents substantiating the safety of radwaste management - 8; review of documents substantiating the safety of use of radioactive substances during R&D - 5;

review of documents substantiating the safety of design and engineering of a nuclear facility (service rendering) - 59;

review of documents substantiating the safety of design of equipment for a nuclear facility - 101;

review of documents substantiating the safety of manufacture of equipment for a nuclear facility - 113.

In 2013 Central NRS ITD received no expert review reports with any negative conclusions.

#### Safety review in the Federal Budgetary Enterprise Scientific and Engineering Centre for Nuclear and Radiation Safety (SEC NRS)

In 2013, in the framework of the procedure of licensing of activities in the field of atomic energy use, performed by Rostekhnadzor, the SEC NRS developed 220 expert review reports as per orders of Rostekhnadzor and in accordance with technical assignments for review conduct. 205 expert review reports were made as per the orders of Rostekhnadzor Department for Safety Regulation of Nuclear Power Plants and Nuclear Research Facilities (Department 5) 15 expert review reports were made as per the orders of Rostekhnadzor Department for Safety Regulation of Nuclear Fuel Cycle Facilities, Nuclear Energy Installations of Ships and Radiation Hazardous Facilities (Department 6).

The above-mentioned expert review reports on nuclear facilities and related activities concern the following:

NPP nuclear installations - 185;

nuclear research installations, marine nuclear installations - 1;

storages of nuclear materials, radioactive substances, and radioactive waste storage facilities located at nuclear power plants and fuel cycle facilities, transportation of nuclear materials, radioactive substances and waste - 18;

fuel cycle nuclear installations - 7;

research work, services rendered to operating organizations, activity related to safety review - 9.

Most of review activities related to NPPs were connected with the applications for amendment of the validity terms and conditions of licenses for operation of specific power units.

#### **Nuclear facilities' safety review problems and solutions thereto**

Shortage of qualified technical experts remains the main problem related to ensuring a required

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level of safety review in the field of atomic energy use. This is caused, in particular, by the following circumstances:

limited number of highly qualified middle aged specialists, who professionally use special knowledge, are not involved in the development of the safety cases under review, and can act as safety experts in the field of atomic energy use;

high employment of highly qualified specialists working in leading organizations of the industry, which limits their availability for safety reviews in the time required.

The SEC NRS carries out well-directed activities on increasing the number of technical specialists, who could be involved as experts in the field of atomic energy use. Maintaining the knowledge of the older generation of experts remains a topic objective. Therefore, organizations constantly select and hire young specialists and involve them into expert activity.

### *2.3.2. Industrial Safety Review*

According to Federal Law No. 116-FZ of 21.07.1997 "On Industrial Safety of Hazardous Industrial Facilities", industrial safety review is an activity in the field of industrial safety.

Industrial safety review presupposes the assessment of the compliance of facilities subject to industrial safety review with industrial safety requirements.

In accordance with the provisions of the Federal Law No. 22-FZ dated March 4, 2013 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities" some legislative acts of the Russian Federation and on invalidation of sub-item 114 of item 1, Article 333<sup>33</sup> of Part II of the Tax Code of the Russian Federation", the following shall be subject to industrial safety review:

documents on preservation and elimination of hazardous industrial facilities (HIFs);

documents on technical upgrading of HIFs in case the documents are not included into the HIF design documentation subject to review in accordance with town-planning legislation; technical devices used at HIFs, in cases specified in Article 7 of the Federal Law "On industrial safety of hazardous industrial facilities";

buildings and structures at HIFs designated for technological processes, storage of raw materials and products, relocation of people and handling of goods, liquidation of accident consequences;

declaration of industrial safety developed within the scope of documents on technical upgrading (in case the documents are not included in HIF design documentation subject to review in accordance with town-planning legislation), preservation, liquidation of HIFs, or newly developed declaration of industrial safety;

HIF safety analysis, as well as amendments into HIF safety analysis.

Federal Law of 2 July 2013 No.186-FZ "On introduction of changes in certain legal acts of the Russian Federation where concerns industrial safety review and specifying of certain powers of state supervisory bodies in administrative offense proceedings" introduced several changes into the process of industrial safety review.

Thus, in accordance with the antimonopoly legislation of the Russian Federation an organization licensed to conduct an industrial safety review, is not allowed to conduct the review of HIFs that are owned by it or persons connected with it.

The Law introduces a term of knowingly false conclusion of industrial safety review, which presupposes either that the conclusion was developed without the conduct of the review, or that it is obvious that the conclusion contradicts the content of materials provided to industrial safety expert(s) and considered during the review or the actual state of technical devices

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applied at HIFs, buildings and structures of HIFs, subject to the review.

According to the established procedure, the customer submits the industrial safety review conclusion to the federal industrial safety executive body or its territorial department, where the conclusion is registered within five working days after the conclusion was submitted.

Besides, the Law specifies that an industrial safety review shall be conducted according to the procedure established by federal codes and standards in the field of industrial safety, and taking into account the principles of independence, objectivity, comprehensiveness and completeness of examinations performed with the use of state of the art science and technology.

In 2013, to implement RF legislation provisions, Rostekhnadzor developed the Regulations for industrial safety review approved by Rostekhnadzor Order No. 538 of November 14, 2013, registered by the Ministry of Justice of Russia under No.30855 on December 26, 2013).

The provisions of the above-mentioned legislative legal acts are enacted on January 1, 2014.

In 2013 industrial safety reviews were conducted by organizations having relevant licenses at the expense of the customer. In 2013 the number of valid licenses for industrial safety review conduct issued by Rostekhnadzor was 4,183. 360 inspections of the compliance with industrial safety review license requirements were held during the reporting period.

146 inspections revealed license requirements violations made by organizations conducting industrial safety review. 664 violations were revealed. Administrative penalties were imposed in the total amount of 8,517 rubles. One license was suspended upon court decision.

In 2013, Rostekhnadzor approved and registered 331,200 industrial safety review reports, 22,669 review reports were rejected as they did not comply with established requirements.

The main scope of review covers technical devices used at hazardous industrial facilities.

The most of industrial safety reviews of technical devices fall to the hoisting mechanisms. Significant number of industrial safety review activities falls on the oil and gas industry, gas consumption and gas distribution facilities, petrochemical and oil-refining industry, boiler facilities, chemical industry and special chemistry facilities.

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## ***2.4. Registration of Facilities in the State Register of Hazardous Industrial Facilities***

Adoption of Federal law No. 22-FZ of March 4, 2014 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", some legislative acts of the Russian Federation and on invalidation of sub-item 114 of item 1 of Article 333<sup>33</sup> of Part II of the Tax Code of the Russian Federation" (hereinafter referred to as Federal Law No.22-FZ) was the most important event in 2013. This law has become a new milestone in development of legislation in the field of industrial safety. The main purpose of Federal Law No. 22-FZ is to establish the measures aimed at enhancement of the legal regulation efficiency, removal of redundant administrative barriers for execution of investment and production activities in the field of industrial production and other sectors, creation of stimuli for modernization of the domestic economy as well as reliable control of process and economic risks of production activities at the same time.

The exact criteria for identification of HIF have been introduced since March 15, 2013 when Federal Law No. 22-FZ has been put into effect.

The facilities, safety of which is ensured by other regulation means, have been finally excluded from the HIF scope, and namely these facilities comprise:

- electrical supply network facilities;

- elevators, escalators (besides the subway escalators), elevator decks for disabled persons;

- facilities for mining of generally used minerals and exploitation of gravel mineral deposits in open pits without any blasting operations;

- facilities where metal melts and alloys based on these melts are being produced, transported and utilized with application of equipment designed for the maximum melt amount not exceeding 500 kg.

The classification of HIFs put into effect by Federal Law No. 22-FZ has been harmonized with the legislation of the European Union.

All HIFs have been divided into the following four classes of hazards taking into account the degree of risk of the accident occurrence and the scopes of its possible consequences:

- class I — extremely high-hazard facilities;

- class II — high-hazard facilities;

- class III — medium-hazard facilities;

- class IV— low-hazard facilities.

Depending on the HIF types, different quantitative characteristics are applied for their classification, such as: the mass of hazardous substances used in various processes, pressure in pipeline systems, scopes of the mined rock exploitation, use of equipment designed for the specific metal melt mass. Qualitative characteristics determine the types of activities or production, e.g. HIFs for drilling and extraction of oil, gas and gas condensate, elevators, HIFs for flour-and-cereals industry facilities, provender milling facilities, as well as gas distribution and gas consumption network facilities. When classifying the facilities utilizing the equipment operating under excess pressure, one should also consider social significance of consequences of accidents involving this equipment.

Federal Law No. 22-FZ sets forth various legal regulations for the facilities

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attributed to different hazard classes. Therefore, assignment of the hazard classes to HIFs has become the first step in implementation of the mentioned law. The hazard classes for the currently operating HIFs should be assigned in the course of their re-registration in the state register.

The state service related to registration of HIFs in the state register of HIFs and maintenance of the state register of HIFs is carried out on the basis of and in accordance with Federal Law No. 116-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities", the Rules for Registration of Facilities in the State Register of Hazardous Industrial Facilities approved by Resolution of the Government of the Russian Federation No. 1371 of November 24, 1998 according to the procedure established by the Administrative Regulations of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia for execution of the state function related to registration of hazardous industrial facilities and maintenance of the state register of hazardous industrial facilities approved by Order of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. 606 of September 4, 2007.

The name of the HIF shall be assigned by the operating organization taking into account the Requirements for maintaining of the state register of hazardous industrial facilities regarding assignment of names to hazardous industrial facilities for the purpose of registration in the state register of hazardous industrial facilities approved by Order of Rostekhnadzor No. 168 of April 7, 2011 based on the identification of the facility to be performed individually, with full responsibility for authenticity of the identification results.

The state register of HIF comprises maintaining of departmental and territorial sections thereof.

All sections of the state register of HIF are maintained based on the unified regulatory-and-methodical and software principles.

Registration of HIFs and maintaining of the departmental sections of the state register based on the authorities in the field of industrial safety are carried out by: the Ministry of Defense of the Russian Federation, the Federal Service of Punishment Execution, the Federal Security Service of the Russian Federation, the Federal Custodial Service of the Russian Federation, the Foreign Intelligence Service of the Russian Federation, the Main Office of the Special Programs of the President of the Russian Federation, The Federal Agency of Special Construction of the Russian Federation, as well as the State Atomic Energy Corporation "Rosatom".

The authorities for registration of HIFs in the state register of hazardous industrial facilities, making changes in information of the state register of HIFs are under the competence of the territorial bodies of Rostekhnadzor; Rostekhnadzor's Headquarters is not carrying out registration of HIFs.

Since March 2013 operating organizations have been given a possibility to apply for re-registration in the State Services' Portal ([www.gosuslugi.ru](http://www.gosuslugi.ru)). Summing up the results of 2013 it may be noted that the Rostekhnadzor territorial departments made re-registration of 79.4% of the total amount of HIFs registered in the state register as of March 15, 2013 (285,750 facilities).

According to the data contained in the Rostekhnadzor's integrated information system as of January 1, 2014, the state register of HIFs provides information about 217,206 facilities, 143,519 of which have been re-registered and given a hazard class.

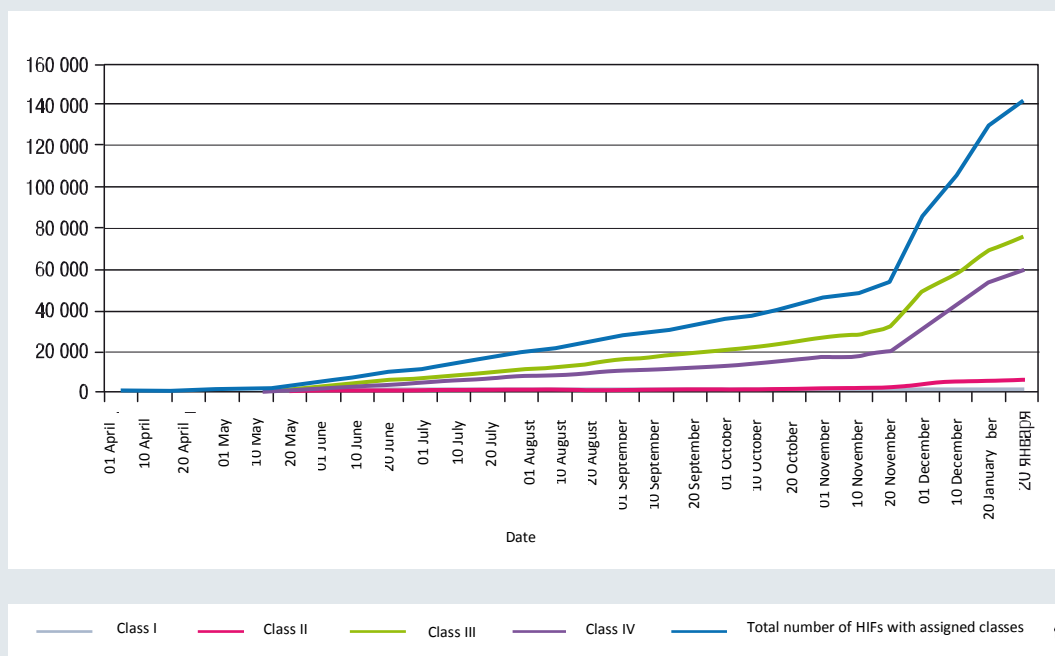
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84,618 facilities were excluded, which amounts to 30% of the total number of HIFs being in the state register as of March 15, 2013.

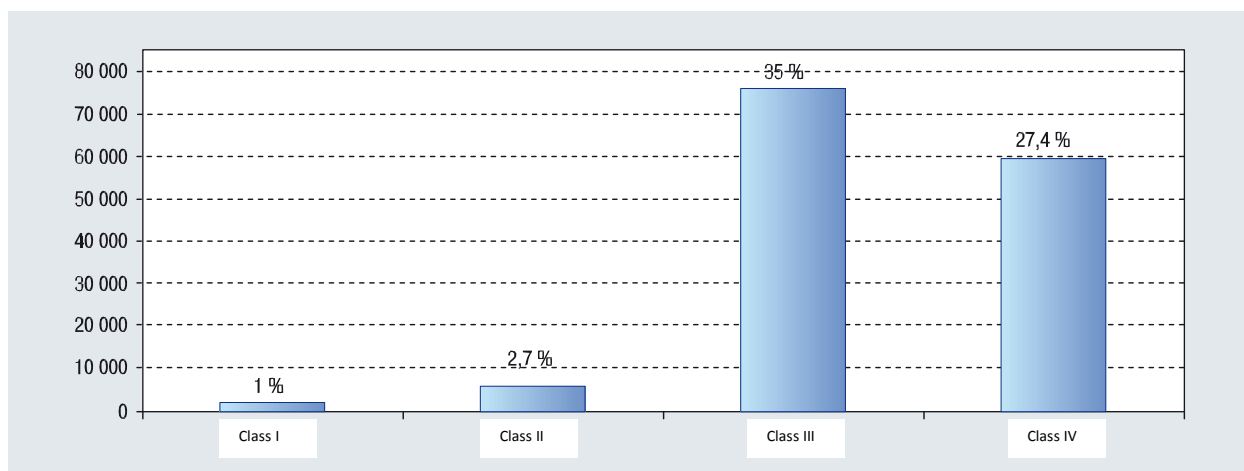
Distribution of the re-registration process in 2013 in terms of the hazard class allocation is presented below in Fig. 66.

It may be inferred from the figure that in the beginning the re-registration process was carried out uniformly with minor increase of HIFs being re-registered, however since end October the number of the re-registered HIFs surged ahead. Thus, for the first six months since the registration had started more than 55 thousand facilities were re-registered, whereas for the past month and a half or even less, i.e. from end November to December 31, 2013 more than 87 thousand facilities were re-registered.



**Fig. 66.** Distribution of the re-registration process in 2013 in terms of the hazard class allocation

As of January 1, 2014, the vast majority of the facilities out of the total number of HIFs being registered is represented by medium-hazard facilities (class III) - 35% (more than 59 thousand facilities), low-hazard HIFs (class IV) - 27.4 % (more than 76 thousand facilities), high-hazard HIFs (class II) - 2.7% (less than 6 thousand facilities), extremely high-hazard HIFs (class I) - 1% (more than 2 thousand facilities) (Fig. 67).



*Fig. 67. Distribution of registered HIFs according to hazard classes*

### ***2.5. Declaration of Industrial Safety***

Declaration of the HIF industrial safety is a document containing the results of the comprehensive accident risk assessment, analysis of the adequacy of measures taken in connection with accident prevention and ensuring preparedness of the organization for operation of HIFs as per requirements of industrial safety codes and standards, as well as for confinement and elimination of the accident consequences at HIFs (RD-03-14-2005).

Federal Law of the Russian Federation No. 22-FZ of March 4, 2013 "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", some legislative acts of the Russian Federation and on invalidation of sub-item 114 of Article 333<sup>33</sup> of Part II of the Tax Code of the Russian Federation" introduced a number of changes into the procedure of industrial safety declarations' development.

Thus, in particular, obligation was established to develop industrial safety declarations for HIFs of hazard classes I and II, which are involved in obtaining, utilization, processing, generation, storage, transportation and disposal of hazardous substances.

According to Federal Law No. 22-FZ, the declaration of industrial safety shall be developed as part of design documentation on HIFs construction, reconstruction, as well as documentation on technical upgrading, preservation and elimination of HIFs.

The declaration of industrial safety for the HIF being currently in operation shall be newly developed:

- on expiration of ten years since the day when the last industrial safety declaration had been included into the register of industrial safety declarations;

- if process procedures at HIFs are modified or the number of hazardous substances which are located or may be located at a HIF increases more than by 25 percent;

- in case of changes in the industrial safety requirements;

- upon the statement of order issued by the federal executive authority in the field of industrial safety or its territorial body in case of finding any non-conformity of information contained in the industrial safety declaration with the information obtained in the course of the federal state industrial safety supervision.

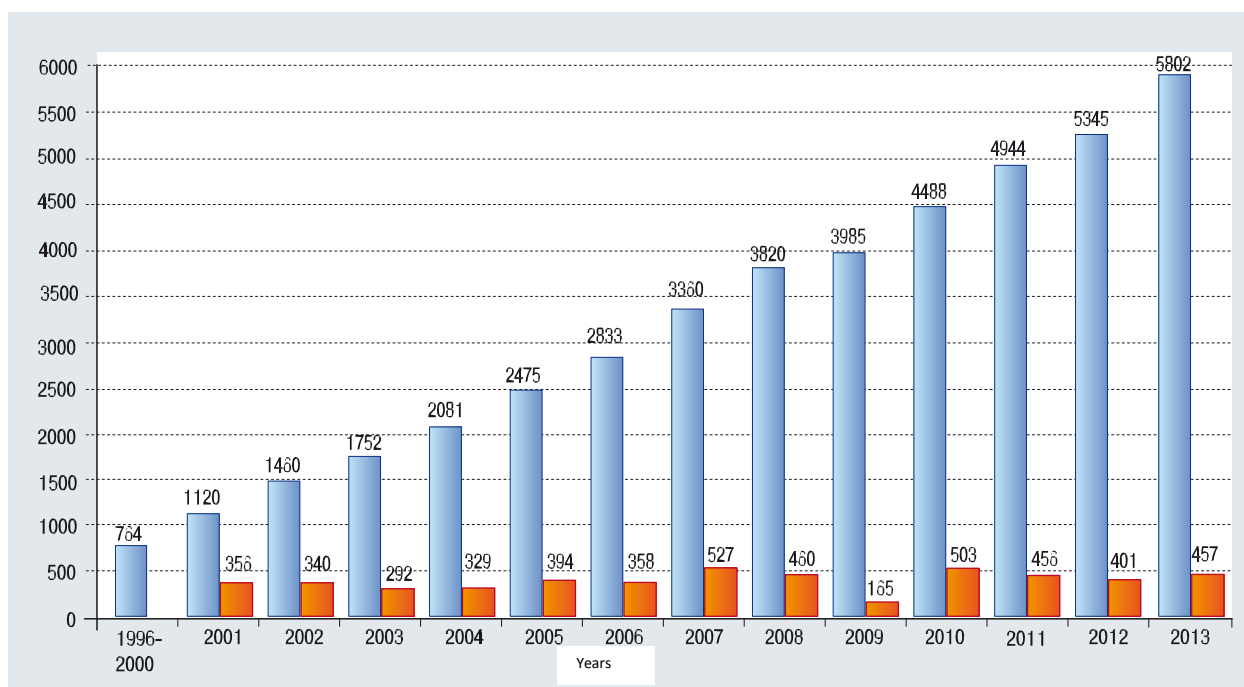


Federal Law No. 22-FZ introduced the procedure for maintaining the register of industrial safety declarations, thereby revoking the function of Rostekhnadzor to approve the industrial safety declarations.

In 2013, the Federal Environmental, Industrial and Nuclear Supervision Service of Russia registered 457 industrial safety declarations, of which:

in petrochemical and oil refining industries .....	99
in oil and gas production industry .....	120
at oil trunk pipeline transportation facilities.....	76
at gas distribution and gas consumption facilities.....	31
in metallurgical industry .....	17
at explosive materials' storage facilities .....	54
in chemical industry.....	60

The analysis of the information on the progress of the hazardous industrial facilities' declaration (Fig. 68) demonstrates that declaration is generally accomplished in line with the requirements of Federal Law No. 116-FZ and other regulatory legal acts.



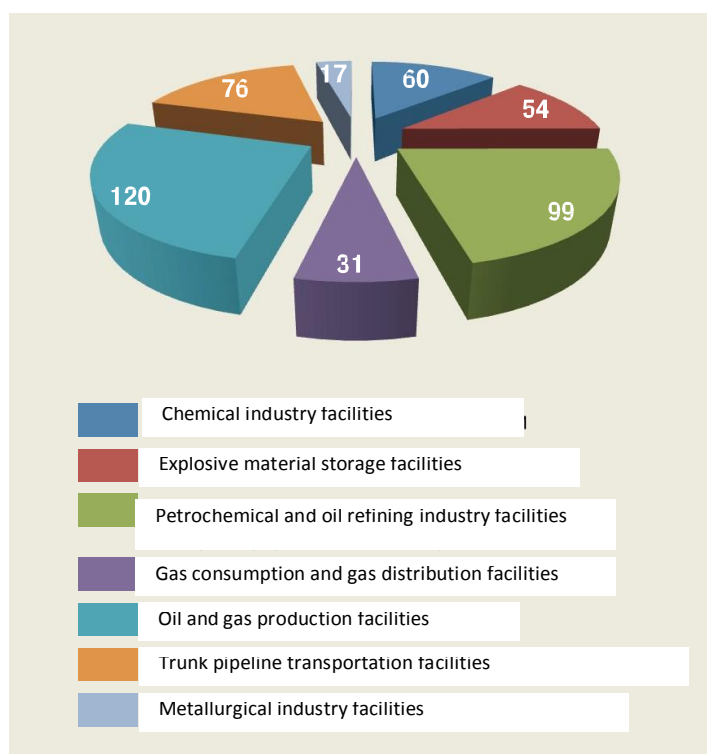
**Fig. 68.** Dynamics of Industrial Safety Declarations' Development within 1996-2013

Distribution of industrial safety declarations registered in 2013 by industries is presented in Fig. 69.

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The largest number of industrial safety declarations was developed for the oil-and-gas production facilities.

The analysis of the information on the progress of the hazardous industrial facilities' declaration demonstrates that declaration is generally accomplished in line with the requirements of Federal Law No.116-FZ and regulatory legal acts of the Russian Federation.



**Fig. 69.** Distribution of declarations developed and approved in 2013 by industries

## **2.6. Scientific and Technical Support of Regulatory Activity**

### **2.6.1. Research in Nuclear and Radiation Safety**

In 2013 the Federal Budgetary Enterprise FBE SEC NRS rendered the scientific support in the regulatory activity to the Federal Environmental, Industrial and Nuclear Supervision Service within the framework of:

- the state order financed from the federal budget;
- the Federal Target Program "Nuclear and Radiation Safety Assurance for 2008 and for the Period up to 2015" (FTP NRSA);
- federal target program "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015";
- the international cooperation agreements and contractual work with nuclear sector organizations.

#### **2.6.1.1. State task order of FBE SEC NRC (STO-2013).**

In 2013, the FBE SEC NRS in the framework of the state order carried out the activities in two directions and five sections envisaged by the "Departmental list of the state services (activities) rendered (performed) by federal state enterprises within the jurisdiction of Rostekhnadzor as main activity types".

In the framework of implementation of 23 subject areas of research and development work, 87 reports containing the research work results as well as draft regulatory documents (federal codes and regulations and safety guides) were issued.

All research and development work was aimed at providing scientific and engineering support to the Rostekhnadzor's regulatory activity in the field of atomic energy use.

The main results of research made in the framework of the state task order are presented below.

The following works have been carried out in the field *"Applied studies and development including the following areas: regulation of nuclear and radiation safety, physical protection of nuclear facilities, accounting and control of nuclear materials and radioactive substances"*:

final revisions of the following draft federal codes and regulations were completed taking into account the received comments for publication:

General provisions for safety assurance of transportation and transportable nuclear installations (to replace NP-022-2000);

General requirements for the probabilistic safety analysis for nuclear power plants;

The Requirements for Planning the Activities on Actions and Protection of Employees (Personnel) in case of Nuclear and Radiation Accidents at a Floating Power Unit;

Rules for Investigation and Accounting for Violations in Management of Radiation Sources and Radioactive Substances used in the National Economy (to replace NP-014-2000);

the second revision of the draft Federal codes and regulations "Rules for design and safe operation of stationary compressor plants, air ducts and gas lines at nuclear facilities" was developed;

the final revision of the draft safety guide was completed taking into account the received comments for submitting for approval of the "Radiation and thermophysical characteristics of spent nuclear fuel of water cooled water moderated power reactors and light water-cooled graphite-moderated reactors" recommended for usage in safety assessment during licensing of nuclear facilities.

In the framework of this field, proposals were prepared on improvement of the currently applicable regulatory documents based on analysis and systematization of the received proposals and comments, as well as nuclear facilities' safety assessment results. Based on the activities' results, the information on the regulatory documents being developed was systematized as well as proposals were prepared on elaboration of the list of regulatory documents (FCR and SG) subject to development, revision and amendment. Besides, the proposals were prepared on elaboration of the plan for updating of federal regulations in the field of atomic energy use for 2014-2023 based on the results obtained during previous stages of the research work.

The following work was carried out in the field *"Activities on examinations, investigations, testing, reviews and other types of assessment, as well as generation and maintenance of databases pertaining to assurance of measures on investigation of causes of accidents, occurrences, incidents and emergencies of man-induced nature and elimination of consequences thereof"*:

draft methodical document "Recommendations on the procedure of development and maintaining of calculation models for express assessments of accident flows (except for severe ones) at VVER NPPs to enable scientific and technical support of the Information and Analytical Center of Rostekhnadzor" was developed.

The following works were carried out in the field *"Activities on examinations, investigations, testing, reviews and other types of assessment, as well as generation and maintenance of databases pertaining to assurance of measures on safety assessment of nuclear facilities"*:

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numerical calculation of residual stresses in various types of welded joints of RMBK-1000 DN 300 pipelines with proposals on Rostekhnadzor's regulatory activities;

numerical calculation of redistribution of residual stresses in the welded joints of RMBK-1000 DN 300 pipelines as a result of swaging with proposals on Rostekhnadzor's regulatory activities;

work related to review (certification) of the software tools (ST) used for nuclear facilities' safety analysis through the ST Certification Expert Board and sections thereof;

draft Provisions were developed on the arrangement and performance of review of software tools applied in safety analysis and/or assurance of nuclear facilities;

final revision of the draft safety guide was completed taking into account the received comments for subsequent submittal for approval of the "Provisions for the structure and content of documents to be provided for establishing of the limits of maximum permissible radioactive releases and the limits of maximum permissible radioactive discharges and granting permits for the maximum permissible releases and permissible radioactive discharges to the environment";

the methodology for calculation of small-group neutronic constants for the non-stationary model of the VVER TOI reactor plant was developed and verified to enable scientific and technical support of the NPP operation licensing;

non-stationary calculation models of the VVER TOI reactor plant were developed and verified to enable scientific and technical support of the NPP operation licensing;

The works in six subject areas were carried out in the field *"Activities on examinations, investigations, testing, reviews and other types of assessment, as well as generation and maintenance of databases pertaining to collection, storage, processing and analysis of the information pertaining to the lists of hazardous industrial facilities, granted licenses and permits, results of control and supervisory activities, data on incidents, accidents, casualties, other occurrences at the facilities being supervised"*.

In the framework of this activity:

effort was continued to analyze the occurrences during operation of nuclear facilities, as well as annual safety reports of nuclear facilities. Analysis were made on the operational occurrences at NPPs, radiation sources, research nuclear installations, NFC facilities and nuclear power installations of vessels and other offshore facilities, as well as in the systems of control and accounting of nuclear materials and radioactive substances at nuclear facilities. Work was continued to incorporate the information about nuclear facilities' operational occurrences in 2013 into the databases including the NPP database "ICI-Nadzor" (incidents' information system - supervision) into the database for nuclear research installations "ISUN-NRI";

generalized analysis of information about deviations and failures posing a hazard for integrity of equipment and pipelines occurred in 2013 was made accompanied with proposals on the Rostekhnadzor's regulatory activities;

the work executed made it possible to find out trends in dynamics of nuclear facilities' operational occurrences and lacks of safety, assess the state of nuclear facilities' nuclear and radiation safety, as well as assess the need in development and revision of regulatory documentation. Lacks of nuclear facilities' safety and problems

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to be resolved by the operating organizations in order to enhance safety of nuclear facilities were revealed.

The following works were carried out in the field *"Activities on examinations, investigations, testing, reviews and other types of assessment, as well as generation and maintenance of databases pertaining to collection, storage, processing and analysis of the information pertaining to the use of atomic energy, radioactive material and substances, results of supervision over accounting, storage and physical protection of nuclear materials"*: analysis of variation of neutronic characteristics of the Smolensk, Leningrad and Kursk NPPs' power units within 2012-2013 accompanied with proposals on the Rostekhnadzor's regulatory activities;

assessment of the impact of the spacing effects during RBMK-reactors' subcriticality measurement accompanied with proposals on the Rostekhnadzor's regulatory activities;

safety analysis for operation of NPP and SFSF buildings and structures based on results of hydrological monitoring observations accompanied with proposals on Rostekhnadzor's regulatory activities;

The recommendations were prepared on improvement of the safety analysis for operation of NPP and SFSF buildings and structures based on results of hydrological monitoring observations accompanied with proposals on Rostekhnadzor's regulatory activities;

databases for 2013 have been updated, access to the information resources of the specialists of the Rostekhnadzor Headquarters and Interregional Territorial Departments for supervision over nuclear and radiation safety has been provided.

The following works were carried out in the field *"Activities on examinations, investigations, testing, reviews and other types of assessment, as well as generation and maintenance of databases pertaining to collection, storage, processing and analysis of the information pertaining to execution of international obligations of the Russian Federation in the field of safety assurance in atomic energy use and industrial safety"*: the information on interfaces of Rostekhnadzor with international organizations and associations in the field of safety regulation in atomic energy use in 2013 was analyzed and systematized;

proposals were prepared to support elaboration of the Rostekhnadzor's position in the framework of participation in the activities of international organizations (IAEA, OECD NEA, CIS, EurAsEC), associations (WENRA, VVER Forum, MDEP, etc.), as well as in the framework of international alliances (CIS, EurAsEC);

IAEA draft safety standards were reviewed to elaborate the Russian position on agreement of these standards, proposals on taking into account of these IAEA documents during development and (or) revision of Rostekhnadzor's documents based on the performed analysis and systematization of information on interfaces among Rostekhnadzor and international organizations, associations and alliances in 2013.

#### **2.6.1.2. FBE SEC NRS activity in the framework of Federal Target Program "Nuclear and Radiation Safety Assurance for 2008 and for the Period up to 2015"**

The main purpose of the Federal Target Program "Nuclear and Radiation Safety Assurance for 2008 and for the Period up to 2015" (hereinafter referred to as the Program) is comprehensive solution to the problem of nuclear and radiation safety assurance in the Russian Federation.

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In 2013, FBE SEC NRS accomplished work under the Program covering all 14 activities, the state customer of which was Rostekhnadzor.

In the framework of 14 government contracts, FBI SEC NRS covered 40 subject areas of research and development work and prepared 91 reports containing scientific and technical products in the form of various revisions of regulatory documents (federal codes and regulations and safety guides) and reports on research and development work.

The main purpose of the work implemented is to obtain the results contributing to efficient fulfillment of the tasks faced by Rostekhnadzor in carrying out the actions under the Program set forth by the state customer by Decree of the Government of the Russian Federation

No.444 dated 13.07.2007. The activities conducted were aimed at comprehensive resolution of the problem associated with scientific support of nuclear and radiation safety regulation.

The main results of the accomplished work are presented below.

***Activity 47. Scientific and informational/analytical support in the field of safe management of spent nuclear fuel and radioactive waste***

In the framework of this activity:

final revisions of the following draft safety guides were completed for subsequent submittal for approval:

Safety assessment of near-surface radwaste disposal facilities; Recommendations on development of quality assurance programs for radioactive waste management;

the second revision of the draft Federal codes and regulations "Requirements for safety assurance during decommissioning of radioactive waste storage facilities" was developed;

final revisions of draft changes to the Federal codes and regulations were completed to determine the possibility of publishing of the following documents:

Collection, treatment, storage and conditioning of liquid radioactive waste. Safety requirements (NP-019-2000);

Collection, treatment, storage and conditioning of solid radioactive waste. Safety requirements (NP-020-2000);

Gaseous radioactive waste management. Safety requirements (NP-021-2000);

Safety regulations for handling radioactive waste of nuclear power plants (NP-002-04);

the problems related to management of spent nuclear fuel for NPPs with metallic coolant based on the lead-bismuth alloy were analyzed.

***Activity 249. Scientific and informational/analytical support for solving the problems accumulated in the field of nuclear and radiation safety.***

In the framework of this activity:

the information about the near-surface radioactive waste disposal facilities of FSUE PA Mayak was collected and analyzed;

predictive calculations were made to assess safety of the near-surface radioactive waste disposal facilities of FSUE PA Mayak;

recommendations were developed for establishing priorities in safety regulation of the near-surface radwaste disposal facilities of FSUE PO Mayak; the second revision of the draft Federal codes and regulations "Requirements to the content of safety analysis report for nuclear research installations" was developed (to replace

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NP-049-03);

the second revision of the draft change to the Federal codes and regulations "Nuclear safety regulations for research reactors" (NP-009-04) was developed;

the final revision of the draft change to the Federal codes and regulations "Nuclear Safety Rules for Critical Assemblies" (NP-008-04) was completed.

***Activity 303. Justification of principles and development of recommendations for optimizing environment radiation monitoring regulation at nuclear facilities.***

In the framework of this activity, proposals were prepared on development of the regulatory and legal basis aimed at improvement of the radiation situation monitoring at nuclear facilities in terms of regulation of the radiation monitoring system at nuclear facilities including a list of federal codes and regulations, safety guides and methodological instructions recommended for development, revision, modification and amendment.

***Activity 304. Development of the elements of state nuclear material, radioactive substances and radioactive waste control and accounting systems***

In the framework of this activity the final revisions of the following draft safety guides were developed:

"Structure and content of a standard instruction for control and accounting of radioactive substances and radioactive waste at organizations carrying out activities involving RS and RW";

"Recommendations on the use of sealing devices in the radioactive substances and radioactive waste control and accounting systems".

***Activity 305. Development of methodology and construction of information support computer system regulating activities at normal operation of nuclear facilities and at accidents.***

In the framework of this activity:

the draft Regulations for functioning of the information and analytical center was developed in accordance with the Concept of the Rostekhnadzor IAC Development;

The album of the WWER-440 NPP emergency modes was developed for the Rostekhnadzor's Information and Analytical Center based on the analytical simulator power unit computer model of Unit No.3 of the Novovoronezh NPP;

calculation and experimental studies were performed in relation to radiation burden of the reactor pressure vessels of VVER-1000 and VVER-440 reference power units with modernized core loading (new fuel), recommendations were developed for assessment of the forecast on aging of VVER reactor pressure vessels exposed to radiation.

***Activity 306. Regulatory control in assuring physical protection of nuclear materials.***

In the framework of this activity:

the final revision of the draft safety guide "Assessment of the status of the physical protection system at a radiation hazardous facility" was completed for submittal for approval;

the second revision of the draft changes to the Federal codes and regulations "Requirements for physical protection of vessels with nuclear power installations and vessels carrying nuclear materials" (NP-085-10) was developed (introduction of the additional section on physical protection at floating nuclear thermal power plants).

***Activity 325. Development of the methodology for assessment of the status of radiation safety at radiation hazardous facilities related to historical and current activities of mining and processing mineral and organic raw materials with high concentrations of natural radionuclides.***

In the framework of this activity:

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a hazard of uncontrolled exothermic reactions in nitric acid solutions with reducing agents used in the SNF radiochemical treatment processes was evaluated;

the status of the state safety regulation in terms of emergency preparedness of radiation hazardous facilities was assessed for compliance with the requirements of IAEA safety standard GS-R-2 "Preparedness and Response for a Nuclear and Radiation Emergency".

***Activity 326. Development of safety assessment methods for nuclear fuel cycle facilities.***

In the framework of this activity:

the final revision of the draft changes to the Federal codes and regulations "Safety rules for transportation of radioactive material" (NP-053-04) was completed;

safety assurance aspects related to transportation of VVER-440 and VVER-1000 spent nuclear fuel in TPC-140 and TPC-146 in the new generation transfer packing casks were analyzed;

the following final revisions were developed:

draft changes to the Federal codes and regulations "Accounting of External Natural and Man-Induced Impacts on Nuclear Facilities" (P-064-05);

draft safety guide "Structure and content of the safety analysis report for decommissioning of nuclear fuel cycle facilities".

***Activity 336. Development of the methods of integrated analysis for safety assessment of nuclear and radiation hazardous facilities.***

In the framework of this activity:

The final revision of the draft safety guide "Structure and content of the manual on management of beyond design basis accidents including severe accidents" was completed for submission for approval;

the following final revisions were developed:

draft changes to the Federal codes and regulations "Regulations for designing aseismic nuclear power plants" (NP-031-01);

draft changes to the Federal codes and regulations "Siting of nuclear power plants. Principal Safety Assurance Criteria and Requirements" (NP-032-01);

draft safety guide "Recommendations for emergency I&C system for NPPs".

***Activity 337. Creation of data base on the use of federal codes and standards and on the assessment of operational occurrences for scientific analysis, development of criteria, principles and basic requirements to nuclear and radiation safety assurance.***

In the framework of this activity:

comparative analysis of the Russian regulatory documents and IAEA recommendations containing provisions on taking into account of external natural and man-induced factors during siting, construction and operation of nuclear facilities was performed; the second revision of the draft changes to Federal codes and regulations "Requirements to Safety Analysis Report of Marine Nuclear Power Installations" (NP-023-2000) was developed to establish the requirements for the floating power units of floating nuclear power plants;

final revision of the draft safety guide "Procedure of analyzing the documentation on equipment, component parts, materials and semi-finished products in order to determine the special requirements derived from the operating conditions thereof" was developed;

final revisions of the following draft safety guides were completed for subsequent submittal for approval:

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Assessment of the current safety level at nuclear facilities; Recommendations for the procedure of ensuring reliability of equipment at nuclear facilities.

***Activity 338. Preparation of materials for the national reports on the Russian Federation's implementation of conventions "On Nuclear Safety" and "Joint Convention on Safe Management of Nuclear Fuel and Safe Management of Radioactive Waste".***

In the framework of this activity:

materials were prepared for the regular National Report of the Russian Federation on Compliance with the Obligations of the Convention "On Nuclear Safety" to be presented at the Sixth Meeting of the Contracting Parties (in the part pertaining to the jurisdiction of Rostekhnadzor);

questions were prepared for the contracting parties regarding the national reports presented at the Sixth Meeting of Contracting Parties;

replies to the questions of the Contracting Parties pertaining to the national report of the Russian Federation were prepared;

analysis was made to review the positive international practice of safety regulation in terms of safety of spent nuclear fuel and radioactive waste management in the countries, which participated in the Fourth Meeting of the Contracting Parties.

***Activity 339. Improvement of informational/analytical support to specialists in terms of the data on nuclear and radiation safety status of nuclear facilities.***

In the framework of this activity:

final revision of the draft Safety Guide "Basic recommendations for elaboration of the NPP Unit Level 1 probabilistic safety analysis for external natural and man-caused initiating events" was developed;

Methodological instructions "Algorithm for calculation of cyclic strength of equipment and pipelines of nuclear power installations (NPI) to assess strength and fracture possibilities of NPI equipment and pipelines when decisions are taken to extend the NPI lifetime" were developed;

Analysis was made of fracture possibilities in pipelines DN300 and DN800 of the forced circulation coolant circuit (FCCC) of RBMK reactors based on brittle and ductile fracture criteria; maintenance of the computer database on defects of NPP equipment and pipelines was continued;

the version of the Russian segment of the international network of authorities for nuclear and radiation safety regulation in atomic energy use was updated based on summarizing of the experience in nuclear and radiation safety regulation taking into account the recommendations of the International Atomic Energy Agency.

***Activity 340. Formation of independent safety assessments of nuclear facilities for the purpose of participation in the activities to create unbiased public opinion on the issues of atomic energy use.***

Methodological instructions for refresher training of specialists in nuclear supervision were developed in the framework of this activity and placed in the Rostekhnadzor's information network; they covered the following activity lines:

"The basis for safety regulation of nuclear fuel cycle facilities";

"Safety regulation at various stages of nuclear fuel cycle facilities' life cycle";

"Safety supervision for nuclear fuel cycle facilities".

***Activity 341. Development of the system for information and referential support of activities in the field of nuclear and radiation safety with using the approaches of the International Atomic Energy Agency and other international organizations.***

The following works were carried out in the framework of this activity:

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the final revision of the draft safety guide "Content and composition of annual nuclear and radiation safety report for nuclear fuel cycle facilities" was completed for submission for approval;

information and referential support of activities carried out by the interregional territorial departments for nuclear and radiation safety supervision was provided in 2013.

#### ***2.6.1.3. SEC NRS activity in the field of the Federal Target Program "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015"***

In 2013, FBE SEC NRS carried out the activities under the Program in the framework of the government contract with Rostekhnadzor. The main purpose of the work implemented is to obtain the results contributing to efficient fulfillment of the tasks faced by Rostekhnadzor in carrying out the actions under the Program. Rostekhnadzor has been determined as state customer of this Program by Decree of the Government of the Russian Federation No.555 dated 07.07.2011.

In the framework of activities executed, a draft safety guide was developed on "Minimization of radiation consequences for population and personnel during elimination of the accident consequences at power units of different types of NPPs. Methods for optimization of measures on protection of population and territories".

#### ***Cooperation with the federal executive authorities, academic and application institutes, institutions of higher education and other organizations***

In 2013, cooperation with the federal executive authorities, academic and application institutes, institutions of higher education and other organizations was carried out in the main activity lines of FBE SEC NRS.

To support and ensure development of the educational line of activities (development of the professional education system components for the employees involved in nuclear supervision, namely curricula for NRS regulation, perfection thereof during workshops and practical trainings, ensuring of the post-graduate professional education), cooperation was exercised with the Headquarters and Interregional Territorial Departments of Rostekhnadzor, Rosobrnadzor, RF Higher Examination Board (HEB), State Corporation Rosatom, JSC Rusatom Overseas, Nuclear Safety Institute of the Russian Academy of Sciences (IBRAE), Moscow Power Engineering Institute (Technical University) - MPEI (TU), National Research Nuclear University "MEPhI" (Moscow), Obninsk State Technical University for Nuclear Power Engineering (IATE, Obninsk), NOU "Central Institute for Continuing Education & Training" (Obninsk), International Atomic Energy Agency (IAEA), as well as with regulatory authorities of Germany (GRS), France (IRSN), Vietnam and Turkey.

FBE SEC NRS cooperated in the main activity lines in the framework of contracts with Rostekhnadzor, JSC "Rosenergoatom Concern" (including branches thereof), Akkuyu NPP Power Generation Joint Stock Company, State Corporation Rosatom, JSC Geoterm-EM, JSC INESS, JSC Rusatom Overseas, IBRAE RAN, RRC "Kurchatov Institute", Non-Governmental Educational Establishment "Central Institute for Continuing Education and Training" (CICE&T), JSC VNIIAES, JSC GNTs NIAR, JSC NIAEP, JSC NIKIET, JSC Afrikantov OKBM, JSC OKB Hidropress, JSC Leading Institute VNIPIET, JSC SHK, FSUE GNTs RF-FEI, FSUE GHK, FSUE PA Mayak, FSUE RosRao, FSUE FTsYarB, FSUE TsNII KM Prometei,



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FSUE RFYaTs-VNIIIEF, FSUE ATC SPb, JSC Neolant, JSC RAO-Project, JSC Akme-Engineering, FSUE NO RAO, FSUE Radon, FSUE RFYaTs-VNIIIEF, etc.

Interfaces in the framework of agreements on scientific and technical cooperation were maintained with FSUE "VNIIEKhT", Institute of Problems of Chemical Physics (IPCP) of the Russian Academy of Sciences, Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Sciences, Moscow Power Engineering Institute (Technical University) - MPEI (TU), Obninsk State Technical University for Nuclear Power Engineering (IATE, Obninsk).

### ***Forms and methods of activities related to coordination of research work. Challenges and tasks for the future***

The main activity related to coordination of research work is carried through participation of the FBE SEC NRS specialists in the activities of scientific, scientific and technical and public authorities and organizations of the nuclear sector, and namely: FBE SEC NRS Scientific and Technical Research Council (STRC); the STRC, its sections and technical committees of Rostekhnadzor; the STRC of the State Corporation "Rosatom" and sections thereof; the STRC of JSC "Rosenergoatom Concern"; the STRC of MosNPO "Radon".

Participation of employees in the activities of the Russian Scientific Commission on Radiation Protection (RSCR) and interfaces with the Federal Medical and Biological Agency of Russia (FMBA) strengthens coordination of research work with reference to hygienic aspects of radiation safety of people and environment.

The adequate public perception of the state policy in the field of nuclear and radiation safety regulation is formed both by means of the activities in the Public Councils of Rostekhnadzor and State Corporation "Rosatom" and by dissemination of the relevant materials in the Rostekhnadzor information network.

Active participation of the FBE SEC NRS employees in the activity of the Nuclear Society of Russia and its Youth Department not only strengthens interdepartmental interfaces while approving the research work results but also contributes to involvement of the new generation of employees into the Russian nuclear sector and its regulatory authority. The main challenges in scientific support of nuclear and radiation safety regulation important for the future prospect comprise:

- development and scientific and technical justification of new approaches to state regulation of nuclear and radiation safety in the conditions of accelerated development of nuclear power engineering including gradual transition to establishment of licensing and supervisory procedures adequate to potential hazard of the activities in the field of atomic energy use, as well as removal of superfluous administrative barriers during unconstrained safety assurance at nuclear facilities;

- scientific and methodical support of Rostekhnadzor due to inclusion of new state functions into its competence, as well as proposals of the IAEA post-mission in November 2013;

- development of approaches and lines of the regulatory document system's improvement ensuring nuclear facilities' safety regulation;

- improvement of the methodology for establishment of nuclear and radiation safety criteria and principles;

- improvement of the methodology for assessment of nuclear facilities' nuclear and radiation safety, including the lessons learned from the NPP Fukushima accident;

- scientific and methodological support in establishment of the national safety

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infrastructure during NPP construction abroad with due account of the international approaches (with reference to Rostechнадзор).

### *2.6.2. Research in the Field of Industrial Safety*

In 2013 Rostechнадзор participated in the fulfillment of the federal target program "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015".

The state customer - coordinator: Ministry of the Russian Federation for Civil Defense, Emergency Situations and the Relief of Natural Disasters.

Development of scientific and methodological support for the analysis of protection status of hazardous industrial facilities was the key activity of this program in 2013 (in the field of industrial safety).

Besides, some interdepartmental methodological and regulatory documents in the field of protection of population and territories against radiation hazards were developed and introduced.

As of 2013, 3 state contracts were awarded. The main results of the program implementation over the year 2013:

methodological recommendations on analyzing the state of protection of hazardous industrial facilities against various types of man-induced hazards were developed;

methodological recommendations on analyzing the state of protection of hazardous industrial facilities against various types of natural hazards were developed;

methodological recommendations were developed on analyzing the impact of parameters of the fast-response systems designed for stopping the technological processes in case when the limiting values of the damage effects are exceeded, on the degree of protection of hazardous industrial facilities against various types of man-caused and natural hazards;

the draft second revision of the regulatory document "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin" was developed;

lists of comments were prepared on the draft second revision of the regulatory document "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin" was developed;

the draft final revision was developed on the draft regulatory document "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin";

the updated version of the draft final revision of the regulatory document "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin" was developed;

a set of documents was developed to notify about elaboration of the regulatory legal act "On approval and introduction of reliability and safety requirements in electric power engineering "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and

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factors of natural and man-induced origin" and mailing of replies to comments to the departments;

scientific and methodological support of development of the draft regulatory document "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin" was accomplished.

The research work was carried out on "Development of scientific and methodological support for the analysis of protection status of hazardous industrial facilities" in the field of industrial safety and in the framework of the Federal Target Program "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015".

The purpose of this research work is to develop scientific and methodological support for the analysis of the protection status of hazardous industrial facilities.

The tasks of research work consisted in:

development of methodological recommendations on analyzing the state of protection of hazardous industrial facilities against various types of man-induced hazards.

development of methodological recommendations on analyzing the state of protection of hazardous industrial facilities against various types of natural hazards.

development of methodological recommendations on analyzing the impact of parameters of the fast-response systems designed for stopping the technological processes in case when the limiting values of the damage effects are exceeded, on the degree of protection of HIFs against various types of man-caused and natural hazards.

The results of the work in general are designed to ensure protection of HIFs against natural and man-induced threats.

A report was prepared in the process of work containing:

1) methodological recommendations on analyzing the state of protection of hazardous industrial facilities against various types of man-induced hazards.

2) Methodological recommendations on analyzing the state of protection of hazardous industrial facilities against various types of natural hazards.

3) Methodological recommendations on analyzing the impact of parameters of the fast-response systems designed for stopping the technological processes in case when the limiting values of the damage effects are exceeded, on the degree of protection of hazardous industrial facilities against various types of man-caused and natural hazards.

According to the decisions of the Scientific and Technical Board under the Federal Environmental, Industrial and Nuclear Supervision Service of Russia, some non-scheduled research work in the field of industrial safety was prepared in 2013.

1. In the framework of State Contract No. 14-GC/2013 of Wednesday, May 22, 2013, a research work was carried out under the topic: "Development of scientifically justified proposals on methodological support in monitoring of efficiency of licensing in the sphere of Rostekhnadzor's activities".

The purpose of this activity is to develop the proposals on establishment of organizational and methodological support in monitoring of efficiency of licensing in the sphere of Rostekhnadzor's activities.

The tasks of research work consisted in:

detailed elaboration of the requirements envisaged by the Rules for preparation

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and presentation of reports on licensing of specific activities approved by Decree of the Government of the Russian Federation No. 467 of May 5, 2012 as applied to the organizational structure of Rostekhnadzor and authorities related to licensing of specific activity types;

development of proposals on integration of the requirements for reporting materials, information and indices related to licensing envisaged by Decree of the Government of the Russian Federation No. 467 of May 5, 2012 into the Rostekhnadzor's accounting system.

The results of the work are aimed in general at the improvement of the regulatory basis of the state regulation in the field of licensing in the sphere of Rostekhnadzor's activities.

During execution of this activity a report was prepared comprising detailed elaboration of the requirements envisaged by the Rules for preparation and presentation of reports on licensing of specific activities approved by Decree of the Government of the Russian Federation No. 467 of May 5, 2012 and the draft provisions on monitoring of licensing as applied to the organizational structure of Rostekhnadzor and authorities related to licensing of specific activity types, as well as proposals on revision and amendment of the applicable provisions on reporting in Rostekhnadzor aimed at ensuring implementation of Decree of the Government of the Russian Federation No. 467 of May 5, 2012.

2. In the framework of State Contract No. 16-GC/2013 of Monday, May 27, 2013, a research work was carried out under the topic: "Development of proposals on optimization of the structure and content of regulatory legal acts of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia establishing the requirements in the field of industrial safety".

The purpose for execution of this activity is to bring the regulatory legal acts of the federal executive authorities in compliance with the provisions of Federal Law "On introduction of changes into Federal Law "On industrial safety of hazardous industrial facilities", some legislative acts of the Russian Federation and on invalidation of sub-item 114 of Article 333<sup>33</sup> of Part II of the Tax Code of the Russian Federation" taking into account the orders envisaged by items 1 and 2 of the Minutes of the meeting held at the office of Mr. D.A. Medvedev, Chairman of the Government of the Russian Federation, on October 16, 2012, No. DM-P36-43pr.

The following documents were elaborated as a result of the research work:

methodological instructions on development of Federal codes and regulations in the field of industrial safety;

proposals on the comprehensive list of draft federal codes and regulations in the field of industrial safety;

proposals on application of the mechanisms of the state and private partnership during development of federal codes and standards in the field of industrial safety and industrial safety assurance guides;

the list of provisions of the acts currently in force, which are not liable for application since the Federal Law "On industrial safety of hazardous industrial facilities" has been put into effect in the revision applicable since January 1, 2014;

model guidelines on industrial safety assurance setting forth the methods for analysis of safety of hazardous industrial facilities; scientifically-grounded proposals on optimization of the array of regulatory legal acts in the field of industrial safety.

The results of the research work are used during Rostekhnadzor's implementation

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of its function related to normative and legal regulation in the field of industrial safety.

3. In the framework of State Contract No. 11-GC/2013 of May 20, 2013, a research work was carried out under the topic: "Development of the draft Federal codes and regulations on "The rules of industrial safety of hazardous industrial facilities, which use equipment operating under excess pressure".

Based on the research work results, a draft Rostekhnadzor order "On approval of Federal codes and regulations on "The rules of industrial safety of hazardous industrial facilities, which use equipment operating under excess pressure" was prepared. The mentioned document has passed public discussion, which involved leading scientific and research institutions and representatives of the entrepreneurial community, as well as agreement with the interested federal executive authorities and conclusion on regulatory impact assessment made by the Ministry of Economic Development of Russia. This document is ready for approval and submittal to the Ministry of Justice of Russia for registration.

4. In the framework of State Contract No. 11-GC/2013 of May 20, 2013, a research work was carried out under the topic: "Development of draft federal codes and regulations in the field of industrial safety on monitoring of geo- and gas-dynamic state of the rock mass, prediction of rock bumps, sudden coal (rock) and gas outbursts during development of coal deposits".

The coal mines developing the beds hazardous in terms of geo- and gas-dynamic phenomena are the subject of research.

The purpose of the activity is to enhance safety of underground mining of coal deposits hazardous in terms of geo- and gas-dynamic phenomena.

The research method consists in analysis and summarizing of the existing regulatory documents; analysis of technical and technological means and decisions related to safe conduct of mining activities in underground mining facilities. The result of the research consists in development of draft federal codes and regulations (based on the obtained scientifically justified data) on comprehensive monitoring of the coal rock mass condition intended for prediction and elaboration of timely process solutions on prevention of rock bumps and sudden coal (rock) and gas outbursts.

Oil companies developing the coal beds hazardous in terms of sudden outbursts and rock bumps and using high-production mining equipment ensuring high speeds of shortwalls' advance and high rates of coal production in walls constitute the application scope of the requirements of the federal codes and regulations elaborated on the basis of scientific research.

5. In the framework of State Contract No. 46-GC/2013 of Friday, July 05, 2013, a research work was carried out under the topic: "Development of draft federal codes and regulations in the field of industrial safety on the conduct of mining activities at cleanup and preparatory coal mine sections".

Regulatory documentation in the field of industrial safety and safe conduct of mining operations constitute the subject of research.

The purpose of the activity is to provide scientific substantiation of proposals on arranging elaboration of the draft "Instruction on the conduct of mining activities at cleanup and preparatory coal mine sections".

The research method consists in analysis and summarizing of the existing regulatory documents regulating the aspects related to safety assurance during



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conduct of mining operations at the stage of arrangement thereof.

Coal mines constitute the area of implementation.

Significance of the activity consists in enhancement of the safety level during cleanup and preparatory operations.

6. A research work under the topic "Development of draft federal codes and regulations establishing the requirements for the structure and content of the safety analysis for hazardous industrial facilities" was conducted in the framework of State Contract No. 12-GK/2013 of May 20, 2013.

The stated research work was conducted in the full scope.

The Federal Codes and Regulations in the field of industrial safety "General requirements for safety analysis of a hazardous industrial facility" were approved by Rostekhnadzor Order No. 306 of July 15, 2013 registered by the Ministry of Justice of Russia under registration No. 29581 on August 20, 2013.

7. In the framework of State Contract No. 67-GC/2013 of Tuesday, October 08, 2013, a research work was carried out under the topic: "Development of the regulatory legal act in the field of industrial safety of gas-engine fuel filling stations".

During execution of this activity a report on research work was prepared comprising:

1) analytical overview of the foreign regulatory experience and best practices in safety assurance of gas-filling complexes including compressed natural gas filling stations;

2) the first and the final revision of the draft Federal codes and regulations in the field of industrial safety "Safety regulations for gas-engine fuel filling stations";

3) the information about the draft Federal codes and regulations in the field of industrial safety "Safety regulations for gas-engine fuel filling stations" envisaged by the Rules for the regulatory impact assessment conducted by federal executive authorities with reference to draft regulatory legal acts, draft amendments to draft federal laws and draft decisions of the Eurasian Economic Commission Council (approved by Decree of the Government of the Russian Federation No. 1318 of December 17, 2012).

To enable execution of a contract, the received results of the research work were reviewed and approved by the Scientific and Technical Board of Rostekhnadzor on December 10, 2013.

To enable further application of the obtained results of the research work, plans are under way to approve the Federal codes and regulations in the field of industrial safety "Safety regulations for gas-engine fuel filling stations" in 2014. Besides, in 2013 to implement the provisions of item 4 of article 3 and article 4 of Federal Law No. 116-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities" and Appendices 1 and 3 to the Federal Codes and Regulations in the field of industrial safety "General rules of explosion safety for explosion- and fire-hazardous chemical industrial facilities" (approved by Order of Rostekhnadzor No. 306 of July 15, 2013), State Contract No. 78-GK-2013 of December 10, 2013 was awarded for conducting of the research work on the subject: "Development of draft safety guides on analysis of hazards and assessment of risk of accidents at hazardous industrial facilities".

In the framework of this activity it is necessary to develop the safety guides (SG) containing the procedures for analysis of hazards and assessment of accident risks for the HIF safety analysis and declaration of HIF industrial safety during designing

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and operation, and namely:

Methodological basis for analysis of hazards and assessment of risk of accidents at hazardous industrial facilities;

Procedure for modeling propagation of emergency releases of hazardous substances; Procedure for assessment of consequences of air-fuel mixtures' emergency explosions; Procedure for assessment of risk of accidents at linear facilities transporting explosion- and fire-hazardous liquids;

Procedure for assessment of risk of accidents at linear facilities transporting explosion- and fire-hazardous gases;

Procedure for assessment of accident consequences at explosion- and fire-hazardous chemical industrial facilities;

Methods for substantiation of explosion resistance of buildings and structures during explosions of air-fuel mixtures at hazardous industrial facilities.

Completion of this activity is scheduled for May 2014.

Besides, in the framework of implementation of the Long-Term Program for Development of the Coal-Mining Industry in Russia for the Period up to 2030 and the Program for Ensuring Further Improvement of Labor Conditions, Enhancement of Safety of Mining Operations, Reduction of Accident and Injury Rates in Coal-Mining Industry, Maintaining of Capabilities of Paramilitary Mine-Rescue Services and Emergency Rescue Units approved by the Ministry of Energy of Russia, Ministry of Healthcare and Social Development of Russia, EMERCOM of Russia, Rostekhnadzor, and agreed with the Independent Coal Employees Union of Russia (Rosugleprof) in 2013; 10 regulatory documents on fire safety, prevention of dust-gas-and-air mixture explosions, ventilation and operation of electric equipment were developed and approved (9 documents were registered in the Ministry of Justice of Russia), and namely:

The Instruction on monitoring of the mine air composition, determination of the gas volume and establishing of mine categories according to content of methane and/or carbon dioxide approved by Rostekhnadzor Order No. 704 of December 07, 2012, registered by the Ministry of Justice of Russia on February 08, 2013 under registration No. 26936;

The Instruction on electric power supply, selection and checking of electrical devices, cables and relay protection units in the coal mines' line networks with voltage up to 1200V was approved by Rostekhnadzor Order No. 627 of November 6, 2012 registered by the Ministry of Justice of Russia on February 11, 2013 under registration No. 26995; the Instruction on design, examination and measurement of mine grounding resistance was approved by Rostekhnadzor Order No. 625 of November 6, 2012 registered by the Ministry of Justice of Russia on February 11, 2013 under registration No. 26976; Changes to the Safety Rules in Coal Mines approved by Resolution of Gosgortekhnadzor of Russia No.50 of June 5, 2003, were approved by Rostekhnadzor Order No. 708 of December 07, 2012, registered by the Ministry of Justice of Russia on March 11, 2013 under registration No. 27576;

The Instruction on conducting of practice alerts and training exercises under the accident elimination plan was approved by Rostekhnadzor Order No. 59 of February 14, 2013 registered by the Ministry of Justice of Russia on April 8, 2013 under registration No. 28028;

The Instruction on selection and checking of 6 (10) kV electrical devices and

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cables was approved by Rostekhnadzor Order No. 630 of November 6, 2012 registered by the Ministry of Justice of Russia on April 9, 2013 under registration No. 28067; the Instruction on determination of the coal self-ignition delay period was approved by Rostekhnadzor Order No. 132 of April 2, 2013 registered by the Ministry of Justice of Russia on July 5, 2013 under registration No. 28997;

The Safety Rules in Coal Mines were approved by Rostekhnadzor Order No. 550 of November 19, 2013 registered by the Ministry of Justice of Russia on December 31, 2013 under registration No. 30961;

Changes to the Federal Codes and Regulations in the field of industrial safety "The Instruction on monitoring of the mine air composition, determination of the gas volume and establishing of mine categories according to content of methane and/or carbon dioxide" approved by Rostekhnadzor Order No. 704 of December 6, 2012 were approved by Rostekhnadzor Order No. 609 of December 17, 2013 registered by the Ministry of Justice of Russia on January 14, 2014 under registration No. 31018;

The Instruction on calculation and application of roof bolting in the coal mines was approved by Rostekhnadzor Order No. 610 of December 17, 2013 (it is presently being under registration in the Ministry of Justice of Russia).

#### *2.6.3. Research in the Field of Safety of Electrical and Heat Installations and Grids*

In 2013, the State Energy Supervision Department of the Rostekhnadzor Headquarters together with the Federal Budgetary Enterprise "Scientific and Engineering Center "Energobezопасnost" conducted research work on the following subjects.

##### ***1. Federal target program "Reduction of risk and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015"***

The purpose of the program is to develop a comprehensive problem of safety assurance of critical power engineering facilities in case of seismic impacts and related associations of natural and man-induced processes, phenomena and factors. Activities under this topic are carried out in several stages, the first being started in 2011. Within this period five stages of the research work were completed. In 2013, at stage 5 of the research on: "Scientific and methodological support of development of draft regulatory document "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin", a draft final revision of federal regulations "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-induced origin" was developed.

In 2013 a draft final revision of federal regulations was developed, which set out all the necessary requirements for assuring seismic resistance of different types of power engineering facilities and hydraulic structures during their siting, design, operation considering current knowledge of earthquakes, seismic hazards, external effects associated with earthquakes, experience in seismic stability and safety assurance of nuclear facilities and capital construction projects.

In 2014 work will be continued with reference to submittal of the regulatory legal act "Safety assurance of power engineering facilities at earthquakes and earthquake related associations of processes, phenomena and factors of natural and man-

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induced origin" for approval.

***2. Rostekhnadzor Budgetary Sectoral Program "State task order. Federal Budgetary Enterprise "Scientific and Engineering Center "Energobezopasnost" (Power Safety) for 2013 and the scheduled period of 2014-2015".***

The purpose is to gain new knowledge in support of regulatory activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in the field of power engineering.

In 2013, draft final revisions of the following regulatory legal acts were developed:

The federal codes and regulations "Requirements for the Program on multifactor research of high pressure hydraulic engineering structures to assess technical condition thereof".

The federal codes and regulations on multifactor research of high pressure hydraulic engineering structures and equipment of hydraulic power plants to assess the possibility of the design lifetime extension.

Draft final revision of the regulatory legal act "Methodological recommendations on the state civil construction supervision in construction and modernization of hydraulic engineering structures of power engineering facilities".

Draft final revision of the regulatory legal act "Methodological recommendations on the state civil construction supervision in construction and modernization of thermal power plants".

Draft regulatory legal act "Methodological recommendations on the state civil construction supervision in construction and modernization of electrical supply network facilities".

Draft revisions to Decree of the Government of the Russian Federation No. 846 of October 26, 2009 "On approval of the Rules of Investigation of Accidents in Electric Power Industry".

***3. Program of research work based on the state contracts awarded between Rostekhnadzor and bid winners as well as based on the agreements with organizations.***

In 2013, research works under state contracts were conducted on the following topics:

"Development of scientifically justified proposals on revision of the federal law "On safety of hydraulic engineering structures" as well as other related regulatory legal acts in the field of safety of hydraulic engineering structures, normative regulation and assessment of damage, insurance of liability for causing damage during an accident".

"Development of the Safety Guide on "Procedural guidelines for inspection of the operative dispatching system in electric power engineering".

"Development of scientifically justified proposals on the safety supervision of hydraulic engineering structures behind low-head hydraulic engineering structures of class IV in the conditions of insufficiency or non-availability of design documentation".

The research work was coordinated in the framework of agreeing the activity scopes at the stages of research work performance specification elaboration, implementation of research work stages envisaged by these performance specifications and contracts, as well as the research work results' acceptance at the

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sessions of Section No.7 of the Rostekhnadzor Scientific and Technical Board in direct cooperation with scientific advisers and research work executors.

This coordination activity was carried out based on the research envisaged by the state assignment to the Federal Budgetary Enterprise "SEC Energobezopasnost" for 2013, the state contract on implementation of activities under the Federal Target Program "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015" and performance of research in the framework of the contracts with Rostekhnadzor.

Urgent problems for research were specified and obtained interim results of research works were reviewed at the sessions of the Rostekhnadzor STRC, sessions of the Rostekhnadzor STRC section and joint working meetings between executors of researches and the research coordinator, Department for State Energy Supervision, in order to extend researches and regulate the issues related to introduction of the research results.

Besides, activity was carried out to form the tasks for further development of scientific researches in support of regulatory activities in the field of safety of electric and thermal installations and networks for 2014.

The main challenges in scientific support of regulatory activities in the field of safety of electrical and heat networks and HES important for the future prospect comprise development and scientific and technical justification of new approaches to state regulation of safety at power engineering facilities highly important for regulation of energy safety, as well as development of new regulatory legal acts and revision of those currently in force. It would be advisable to continue activities related to updating of the federal legislative provisions and introduction of scientifically justified changes to the federal laws "On Electric Power Engineering" and "On Safety of Hydraulic Engineering Structures". It would be advisable to continue activities related to improvement of inspecting and supervisory activities at electric power engineering facilities in order to enhance efficiency thereof, improve the methodology and regulatory legal acts in order to regulate and assure safety of the HES owned by the RF constituent entities and municipal entities, as well as abandoned HES. Still urgent is problem related to development of criteria to the graded approach to insurance of liability for the accidents at HES taking into account the probability of accidents and assessment of the accident risk.

## ***2.7. Public Information***

In 2013 in order to improve the mechanisms providing access of citizens and organizations to the information on Rostekhnadzor activities as well as to ensure openness and compliance of this information with the principles of the Concept on Openness of Federal Executive Authorities approved by the Government of the Russian Federation, a new structure of the official Rostekhnadzor's website was developed. Decree of Rostekhnadzor No. 282 of July 2, 2013 was developed and approved ("On approval of the structure of the official website of the Federal Environmental, Industrial and Nuclear Supervision Service").

The official website of Rostekhnadzor with renewed structure and design was deployed in November 2013.

Besides, in 2013 the division for communication with the mass media of the International Cooperation and Protocol Department carried out all scheduled activities related to providing information to the mass media on the activities of

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Rostekhnadzor in three major activity lines.

1. Placing of information at the official website of Rostekhnadzor according to the following topics:

conducting of official events with participation of the Rostekhnadzor's management; conducting of international official events with participation of the Rostekhnadzor's management;  
coverage of the progress in implementation of Rostekhnadzor's Plan of Activities for 2013-2018; scheduled and unscheduled inspections of enterprises;  
investigation of the causes of accidents and injuries (weekly updated information); meetings of Rostekhnadzor Public Council, etc.

2. Cooperation with pressmen Treatment of inquiries

The inquiries received from the mass media in 2013 were mainly related to several informational aspects:

approval of federal codes and regulations in the field of industrial safety setting forth the requirements for industrial safety revised in accordance with technologies' development and the necessity of harmonization with the international standards (No. 22-FZ of March 4, 2013) - a press conference of the Rostekhnadzor's Chairman in RIA-Novosti;

information on the progress of preparation for the IAEA follow-up regulatory review mission to assess efficiency of Rostekhnadzor activities in the field of atomic energy use as well as on results of this mission (a press conference was held on November 19, 2013 on the "Results of the mission of the International Atomic Energy Agency to review implementation of recommendations of the November 2009 mission to evaluate the efficiency of the state safety regulatory body in atomic energy use" with participation of Mr. A.V.Ferapontov, acting Chairman of Rostekhnadzor );

determination of hydraulic engineering structures' classes and criteria for classification thereof (Decree of the Government of the Russian Federation No. 986 of November 2, 2013). In 2013, the division for communication with the mass media of the International Cooperation and Protocol Department of Rostekhnadzor cooperated with the leading Russian publishers and information agencies. Publications and news pertaining to the activities of Rostekhnadzor were issued in such newspapers as "Komsomolskaya Pravda", "Kommersant", "Vedomosti", "Russian Newspaper", etc., and such information agencies as RIA Novosti, ITAR-TASS, Interfax, RBC, etc.

Besides, the data on the current Rostekhnadzor's activities were provided in the monthly mass scientific production magazine "Industrial Safety" established by Rostekhnadzor and JSC SEC "Industrial Safety", namely, in its regular head "Information from Rostekhnadzor Press-service".

3. Operational activities.

Mass media representatives were immediately informed by the employees of the division for communication with the mass media of the International Cooperation and Protocol Department about the activities of Rostekhnadzor commissions in case of emergency situations at hazardous industrial facilities. The main causes for establishment of the commissions: an accident at the Vorkytinskaya mine (February), the drop event in Bereznikiy, Perm Region (February - July), a flood in the Far East (August - October), and accident at Zarogsk Hydroelectric Power Plant-2 (September).

Mass media representatives were provided with information on occurrences at

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facilities by means of phone, clarification was provided upon operative requests sent by fax or email. Moreover, mass media agencies obtained immediate information on significant events related to Rostekhnadzor activities.

TV reports on various issues related to Rostekhnadzor activity were broadcasted by Channel 1, VGTRK, NTV, RBK-TV, etc., radio reports were broadcasted by Vesti-FM, Radio of Russia, Radio KP, Kommersant FM, Business FM, etc.

According to the results of 2013, the positive experience in communication with the mass media of the following territorial departments of Rostekhnadzor should be emphasized: Central, West-Ural, Low-Volga, North-Caucasus, Interregional Industrial, North-Western and Middle-Volga.

The main line of the activity related to public communications on nuclear and radiation safety issues covers building of the public opinion and giving an integral insight into regulatory and supervisory activities of Rostekhnadzor at nuclear facilities.

Magazine "Nuclear and Radiation Safety" being an official publication of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia is the main independent source of information regarding regulatory and supervisory aspects both for the specialists of Rostekhnadzor and the specialists working in the nuclear field (certificate of mass media registration PI No. FS77-44504). This magazine is published since 1998 in enable implementation of item 6 of Federal Law No. 170-FZ "On the Use of Atomic Energy". 14 approved regulatory legal acts, 8 draft documents as well as 9 articles pertaining to various aspects of nuclear and radiation safety were published in 2013. To invite the public for discussion of nuclear and radiation safety regulation problems, subscription to the periodical "Nuclear and Radiation Safety" was arranged on the whole territory of the Russian Federation, as well as in the CIS countries and abroad via such subscription agencies as "Rospechat", "The Press of Russia", "UralPress", "Interpochta". Circulation of the magazine amounts to 500 copies, of which 170 copies are circulated among Rostekhnadzor specialists including inspectors of the Interregional Territorial Departments.

Upon agreement with Rostekhnadzor, publications were made in such periodicals as EUROSAFE Tribune (No.23), the collection of works dealing with the symposium on "Urgent issues of the international nuclear law: nuclear safety" in the framework of the Atomexpo Forum.

In 2013, 317 letters as well as 213 telephone applications were received, which contained various questions related to regulatory control of nuclear and radiation safety. Exhaustive answers were given to all questions, including by means of the information posted in the website of FBE SEC NRS.

Filling of the FBE SEC NRS website (hereinafter referred to as the website) is made in compliance with the policy of openness and transparency in the field of safety regulation in atomic energy use. The website is an integral part of the FBE SEC NRS information resources and it constitutes a set of technical, process and organizational solutions providing for the possibility of access of natural persons and legal entities to the information placed on the website (certificate of the mass media registration El No. FS77-44505). The website is intended for giving prompt information to the users about the decisions taken or to be taken by FBE SEC NRS, relevant reference and explanatory information on the activities carried out by FBI SEC NRS including international cooperation both in the Russian and English languages, as well as to build public opinion and give an integral insight into the

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activities of FBE SEC NRS, heighten interest in FBE SEC NRS in the Russian Federation and abroad as a scientific and engineering center, the main objective of which is to obtain and apply new scientific knowledge for scientific and technical support of nuclear and radiation safety regulation including analysis and substantiation of nuclear and radiation safety criteria and requirements in the field of use of atomic energy for peaceful and defense purposes, and the object of activities of which is to implement applied research and development effort aimed at scientific and technical support of nuclear and radiation safety regulation.

The website consists of 6 main headers and 36 subheads, which reflect the full scope of scientific and technical support of Rostekhnadzor's activities in the field of nuclear and radiation safety. The header "Scientific Activity" comprises the information on the regulatory documents of different levels approved in 2013 (13 names of documents) and the information about applicable federal codes and regulations and regulatory documents, as well as the list of software tools' certificates currently in force.

For all persons concerned access was granted to the electronic version of the magazine "Nuclear and radiation safety", as well as the possibility was provided to order publications on nuclear and radiation safety issued in FBE SEC NRS including regulatory documents.

In 2013, 35 regulatory acts and regulatory legal acts were issued on request of the specialists concerned with the gross circulation of 920 copies.

Public relations activities regarding arrangement of measures on building the objective public opinion in the field of atomic energy use were conducted in the form of public events including international ones. The activities of Rostekhnadzor in the field of nuclear and radiation safety regulation was presented at the Ninth International Moscow Forum on "Accurate Measurement - Basis of Quality and Safety" (Russia, Moscow, All-Russian Exhibition Center, May 21-23, 2013).

#### *Treatment of the citizens' applications*

In 2013, 21,475 applications of citizens were in total received at Rostekhnadzor. The territorial departments received 15,908 public applications during the reporting period; 5,567 applications were received by the Rostekhnadzor Headquarters (25.9% of all applications received).

The share of Internet applications made up: 39% in Rostekhnadzor on the whole (8,371 of 21,475 applications received); 84% - in the headquarters (4,675 of 5,567 applications received); 23.2% - in the territorial departments (3,696 of 15,908 applications received).

There were 1,898 personal visits to Rostekhnadzor in 2013, 19 of them took place at Rostekhnadzor Headquarters, the rest of the personal visits, namely 1,879, took place at the territorial departments.

The following territorial departments of Rostekhnadzor received the largest amount of public applications: Central (2119 applications), West-Ural (1,847 applications), Ural (1,536 applications), North-Western (1,353 applications), North-Caucasus (1,126 applications), Low-Volga (959 applications).

The analysis of applications of citizens received by Rostekhnadzor Headquarters in 2013 shows that their subjects are distributed as follows:

- 29.1 % of citizens applied on the issues related to construction supervision;
  - 20.2% - supervision over oil and gas industry facilities, 19.5% - energy
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supervision.

Besides, citizens applied on the issues related to general industrial supervision, mining supervision, licensing and permitting activities, certification and social problems.

33 corruption-related applications were received and reviewed in the headquarters in 2013 (as compared to 19 in 2012).

The majority of public applications received by the Rostekhnadzor territorial departments were related to energy supervision, civil construction supervision and supervisory of the oil and gas industry facilities.

In cases, envisaged by the current legislation, in the process of applications consideration Rostekhnadzor territorial departments conducted 1,571 inspections in 2013.

Following the review of problems touched upon in the public applications, the following measures were taken: officials were brought to administrative responsibility, statements of order were issued, penalties were imposed, the materials on inspections were submitted to the prosecution bodies, citizens were consulted on the issues of concern and relevant explanations were given.

Information and reference documents dealing with public application treatment, the replies to most frequent questions asked by the citizens and the results of applications' consideration were posted on Rostekhnadzor website, namely, in Public Chamber section.

In 2013, measures were taken to enhance the efforts related to treatment of citizens' applications. The "Instruction for review of public applications in the Federal Environmental, Industrial and Nuclear Supervision Service of Russia" was developed and approved by Rostekhnadzor Order No. 366 of August 20, 2013. Changes were made to the Topical Classifier of Public Applications of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostekhnadzor Order No. 650 of December 30, 2013).

In 2013 Rostekhnadzor Headquarters checked the work progress related to citizens' applications consideration in the Volga-Oka, Yenisei and Lower Volga Departments of Rostekhnadzor.

Fulfillment of the requirements of guiding documents pertaining to posting of information on treatment of public applications on the sites of the Rostekhnadzor territorial departments was checked in September 2013.

The workshop with participation of the employees of the territorial bodies responsible for treatment of public applications was held in October 2013. Representatives of the Office of the President of the Russian Federation for treatment of applications of citizens and organizations took part in the workshop activities and presented their reports.

Altogether 50 persons from all territorial departments of Rostekhnadzor took part in the workshop activities.

The participants while presenting their reports exchanged the accumulated experience in treatment of public applications, disclosed some peculiarities of reviewing online (Internet) applications and arranging personal visits.

Activities were carried out to arrange and hold the All-Russian Citizens' Reception Day on December 12, 2013, the Day of the Constitution of the Russian Federation. During the All-Russian Citizens' Reception Day, 154 citizens were received personally, as well as in the audio- and video-communication modes,

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consistent cooperation with other authorities of the Russian Federation was ensured.

In 2013, kick-off and test meetings were held in the Rostekhnadzor headquarters and territorial departments, the information on the special Internet-portal SSTU.RF was posted and updated, video- and audio-equipment was commissioned.

In 2013 Rostekhnadzor territorial departments held 101 meetings and a conference on the enhancement of public application consideration effectiveness.



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### ***III. INTERNATIONAL COOPERATION***

The scope of the international cooperation in 2013 was determined by the main lines of activities exercised by the Federal Environmental, Industrial and Nuclear Supervision Service and the Plan of International Cooperation for 2013.

49 receptions of foreign delegations from 28 countries were arranged in Rostekhnadzor in 2013; 290 representatives of foreign institutions and organizations took part therein.

At the same time 445 employees of Rostekhnadzor were sent on an assignment abroad to participate in 229 international events.

#### ***3.1. International Cooperation in the Field of Nuclear and Radiation Safety Supervision and Control***

##### *Multilateral cooperation*

##### ***Cooperation with IAEA***

##### ***Participation in IAEA policy making bodies***

##### ***IAEA General Conference***

Rostekhnadzor delegation headed by the acting Chairman of Rostekhnadzor - Deputy Head of the Russian Federation delegation took part in the 57<sup>th</sup> session of IAEA General Conference (GC), which was held on September 16-20 in Vienna, Austria. The session was devoted to a great extent to the aspects pertaining to strengthening of the global nuclear safety regime, particularly to implementation of the IAEA Action Plan for nuclear safety.

Bilateral meetings with the management of the IAEA Secretariat and the managers of the IAEA member-states safety authorities were arranged and held during the General Conference. The Interdepartmental Memorandum on cooperation in nuclear and radiation safety regulation in atomic energy use for peaceful purposes was signed during a meeting with the Chairman of the Nuclear Regulation Authority of Japan. During a conversation with D. Flori, IAEA Deputy General Manager for Nuclear Safety, a proposal earlier agreed on the working level was put forward to hold a three-day international workshop under the aegis of IAEA in October 2014 in Moscow in the framework of the Russian Federation's G8 presidency on the lessons learned from the IAEA integrated regulatory review service missions.

##### ***Board of Governors***

In 2013 Rostekhnadzor representative was regularly participating in Board of Governors meetings as a deputy of the Russian Federation representative. During the Board of Governors meeting held in March and September 2013 information was presented on implementation of Action Program on participation of concerned Russian entities and organizations in implementation of the IAEA nuclear safety Action Plan.

##### ***Participation in IAEA international conferences and symposia on the issues of safety regulation in peaceful use of atomic energy***

In 2013 representatives of Rostekhnadzor participated in the following international conferences, symposia and forums held under the aegis of IAEA.

On March 4-7, 2013, an International Conference was held in Paris, France on the

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"Fast Reactors and Relevant Fuel Cycles: Safe Technologies and Sustainable Scenarios". A representative of FBE SEC NRS, who participated in the conference, made a report in the section devoted to the "Safety of fast reactors: Fukushima lessons and goals for the next generation reactors" about the experience in licensing support of the BN-600 reactor operation in Russia. An international conference was held on April 8-12, 2013 in Ottawa, Canada on Effective Nuclear Regulatory Systems: Experience into Regulatory Improvements. The purpose of this conference was to review and assess ways of further improving the effectiveness of regulatory systems for nuclear facilities taking into account lessons learned from the Fukushima Daiichi nuclear accident, as well as to enhance regulatory measures aimed at preventing the occurrence and minimizing the consequences of nuclear accidents, enhance the quality of communication among regulators, strengthen international cooperation on emergency management, etc.

Special attention was paid to the implementation of the IAEA Action Plan on Nuclear Safety. The delegation of Rostekhnadzor headed by the Service's Deputy Chairman took part in the conference, where the Service's Deputy Chairman presented a report on the "Success achieved in resolution of problems defined based on the results of the International Conference on Efficient Nuclear Safety Regulation Systems in Capetown in 2009" and a presentation on "Further steps to improve the nuclear safety regulation system in the Russian Federation: from Fukushima to the future".

The International Ministerial Conference on "Nuclear Power in the 21st Century" arranged by the IAEA jointly with the State Corporation Rosatom was held on June 27-29, 2013 in Saint Petersburg, Russia. In the framework of the conference, the Rostekhnadzor Chairman had bilateral meetings with the management of nuclear safety regulatory authorities of Iran, Slovakia and RSA.

The International Conference on Nuclear Security was held in Vienna, Austria on July 1-5, 2013. The Conference was politically oriented on the whole. A representative of Rostekhnadzor made a report on "Regulation of nuclear security in the Russian Federation. Revisions and amendments in the regulatory documents since 2009".

The International Conference on Safety and Security of Radioactive Sources was held on October 27-31, 2013 in Abu Dhabi, UAE focused on: maintaining of the continuous global control of sources throughout their life cycle. Rostekhnadzor and the State Corporation Rosatom prepared information on implementation of the Code of Conduct on the Safety and Security of Radioactive Sources in the Russian Federation to be incorporated into the conference documents' collection. A representative of Rostekhnadzor took part in the topical meetings of the conference. The International Conference on Topical Issues in Nuclear Installation Safety was held on October 21-24, 2013 in Vienna, Austria with the focus on: defense in depth - advances and challenges in safety of nuclear installations. The specialists of FSUE VO Safety with a report on the "Guideline for management of severe beyond design basis accidents as an element of strengthening the DID concept" and the representatives of FBE SEC NRS with a poster paper on the "Forming of a list of beyond design basis accidents subject to accounting as a first step in establishing the forth effective level of the defense in depth" took part in this conference.

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*use of atomic energy*

Within the framework of this IAEA activity direction Rostekhnadzor's representatives participated in more than 30 events in 2013, comprising:

Consulting meeting on existing and new cyber-threats to be accounted for when developing safety assurance plans;

International meeting of experts on decommissioning and rehabilitation following a nuclear accident;

Meeting on development and updating of training materials on preventive and protective measures against internal hazards at nuclear facilities;

Meeting on elaboration of IAEA documents for additional assessment of safety of nuclear fuel cycle facilities in the light of the Fukushima-Daiichi accident;

Technical Meeting on design safety criteria for sodium-cooled fast breeder reactors;

Technical Meeting on discussion of problems in implementation of decommissioning and environmental rehabilitation programs;

Consulting meeting on revision of the IAEA technical document on the water chemistry at VVER NPPs;

Technical Meeting of the working group on comprehensive demonstration of safety of double-purpose containers for spent nuclear fuel;

Technical Meeting on the procedure of self-assessment of the state of nuclear security culture at the facilities;

Technical Meeting on discussion of the International Project on demonstration of safety of the geological radwaste disposal;

Technical Meeting on the safety analysis methods based on the best practices plus uncertainty;

International meeting of experts on the role of the human factor and organizational aspects for ensuring of nuclear safety in the light of the Fukushima-Daiichi NPP accident;

Technical Meeting on consideration of the Fukushima-Daiichi NPP accident consequences;

Technical Meeting on the spent fuel storage options; Technical Meeting on elaboration of the IAEA technical document

"Development and application of a system of safety objectives for nuclear installations"; Technical Meeting on assessment of the NPP design safety in connection with the consequences of the Fukushima-Daiichi NPP accident;

Meeting on ensuring efficient approaches to the final stage of the nuclear fuel cycle.

Among the most significant events arranged by IAEA in 2013 one should mention the second and the third meetings of the Steering Committee of the Global Nuclear Safety And Security Network (April 2-5 and December 4-7, 2013). A representative of Rostekhnadzor took part in these meetings and made a report on using of the GNSSN website by the employees of the core Russian nuclear agencies and organizations. In the course of the meetings the participants exchanged information on the knowledge networks for nuclear safety, they defined intermediate and long-term strategy on improvement of the Global Nuclear Safety And Security Network.

Besides, a FBE SEC NRS representative attended the second workshop on functioning of portals of the national safety regulatory authorities in peaceful use of

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atomic energy within the framework of the Global Nuclear Safety and Security Network (GNSSN) (Vienna, Austria, June 17-19, 2013). The workshop participants discussed the current state and future prospects of development of national safety regulatory authorities' portals, as well as the possible trends of development of the main principles for building of the International Regulatory Network. Besides, practical exercises were performed on administration of the national portals in the framework of the GNSSN network functioning; the participants pointed out the positive experience in arrangement of activities related to development of the Russian segment of the RegNet network.

In the early 2013 IAEA decided that it was necessary to elaborate a comprehensive report of the Agency on the Fukushima-Daiichi NPP accident. Working groups for elaboration of chapters of the mentioned report were arranged for this purpose. A representative of FBE SEC NRS was included into the Working Group on safety assessment as an expert; he took part in 4 meetings of the Working Group within 2013.

#### ***Participation in IAEA Safety Standards Commission and committees***

Representatives of Rostekhnadzor took part in two meetings of the IAEA Safety Standards Commission (SSC) held in Vienna, Austria in 2013. The meeting participants discussed draft IAEA safety standards, as well as determined the priority lines of activities performed by the SSC, reviewed the aspects related to further learning of the lessons from the Fukushima-Daiichi NPP accident and revision of the relevant IAEA safety standards. Besides, they introduced the progress in the implementation of the IAEA Action Plan on Nuclear Safety and determined the requirements and recommendations to be considered during revision of the safety standards. Chairmen of safety standards committees traditionally presented the reports on the activities of the committees headed by them.

In 2013, the representatives of FBE SEC NRS participated on a regular basis in the meetings of the Nuclear Safety Standards Committee (NUSSC), Radiation Safety Standards Committee (RASSC), Transportation Safety Standards Committee (TRANSSC) and Waste Safety Standards Committee (WASSC) as a member and observer of the mentioned committees. During the joint meeting (WASSC and TRANSSC) held in November 2013, a representative of FBE SEC NRS being an observer of the waste safety standards committee presented (upon agreement with the State Corporation Rosatom and the Ministry of Foreign Affairs of Russia) the proposals prepared by Rospotrebnadzor on development of new IAEA safety standards in the field of radiation safety of the population.

Since the term of office of the Rostekhnadzor's member and observers in the mentioned committees was going to expire in December 2013, Rostekhnadzor sent the names of the candidates for the new member and observers to the Ministry of Foreign Affairs of Russia for subsequent submitting to the IAEA Secretariat.

#### ***Participation in technical cooperation Program activities***

*Activities within the framework of IAEA regional and interregional projects on the issues of safety regulation in peaceful use of atomic energy*

In 2013 representatives of Rostekhnadzor and subordinated organizations took part in activities implemented within the framework of the following IAEA regional and interregional projects:

"Improvement of the national capabilities in the field of population irradiation monitoring";

"Upgrading of regulators' qualification in the field of licensing and inspection of



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NPP new builds";

"Maintaining of safe management of abandoned uranium mines";

"Assistance in safe and efficient decontamination of contaminated nuclear facilities";

"Upgrading of safety regulatory bodies capabilities in the conduct of inspections";

"Improvement of capabilities on NPP operational life for long term operation";

"Improvement of potential in radioactive waste management";

"Increase of efficiency of use and safety of research reactors with the help of associations, coalitions and exchange of best practice";

"Strengthening of the regulatory body competence in the field of licensing and supervision of NPP new builds of generations III and III+";

"Improvement and harmonization of safety assessments, synergy of probabilistic and deterministic safety analyses";

"Strengthening of the regulatory body's capabilities and inspection programs";

"Improvement of safety assessment through the Safety Assessment Education and Training Programme";

"Establishment of robust national infrastructure for nuclear and radiation safety regulation".

#### ***Participation in activities in the framework of the IAEA Regulatory Cooperation Forum***

A representative of Rostekhnadzor took part in the meeting of the IAEA Regulatory Cooperation Forum held on January 21-23 in Brussels, Belgium, jointly with the European Commission to discuss assistance to the regulatory bodies of Vietnam and Jordan in development of the national regulatory systems in the mentioned countries.

The acting chairman of Rostekhnadzor took part in the fifth session of the Forum Steering Committee held on September 18 in the IAEA headquarters in Vienna, Austria. It was announced during the session that Belorussia and Poland intend to join the Forum since 2015. The representatives of regulatory authorities of the mentioned countries provided information on results of the performed self-assessment and confirmed their preparedness to start the activities in the framework of the Forum. The plans on rendering further assistance to the regulatory authorities of Jordan and Vietnam were also discussed.

Deputy Chairman of Rostekhnadzor took part in the Forum Plenary Meeting held on September 20 in the IAEA headquarters in Vienna, Austria. In the framework of the plenary meeting, the interim results of assistance to the regulatory authorities of Jordan and Vietnam rendered upon coordination of the Forum Secretariat were summed up and the proposals on improvement of the Forum activities as well as the plans of activities for 2014 were discussed.

#### ***Participation in activities in the framework of the Convention on Nuclear Safety***

Within the reporting period the representatives of Rostekhnadzor participated in development of the National Report of the Russian Federation for the 6th meeting of the Contracting Parties of the Joint Convention on Nuclear Safety.

Four meetings of the Open-Ended Efficiency and Transparency Working Group established following the decision of the 2nd Extraordinary Meeting of the Contracting Parties on Review of National Reports as per Provisions of the Convention on Nuclear Safety (August 27-31, 2012, Vienna, Austria) were held in

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2013. An expert of FBE SEC NRS took part in two of them (in February and November, 2013) as a Rostekhnadzor's representative.

The Group was established to discuss the measures on strengthening of the Convention on Nuclear Safety and proposals on revisions thereto based on the analysis of the Fukushima-Daiichi NPP accident. As a result of the Working Group activities completed in December 2013 as per Statement of Work, 14 topical lines of the CNS improvement were defined. An Action Plan comprising proposals on revision of texts of the CNS regulations was prepared for each of these lines.

The final report of the working group will be presented at the sixth meeting of the Contracting Parties on review of national reports in accordance with the provisions of the Convention on Nuclear Safety to be held on March 24 - April 3, 2014 in Vienna, Austria.

***Participation in activities in the framework of the Joint Convention on Safety of Spent Fuel Management and on Safety of Radioactive Waste Management***

A representative of Rostekhnadzor took part in the activities of the first intersession meeting on review of proposals of the Contracting Parties on enhancing efficiency of application of the Joint Convention on Safety of Spent Fuel Management and on Safety of Radioactive Waste Management held on April 16-18, 2013 in Vienna, Austria.

The proposals of the Contracting Parties on improving implementation of the provisions of the Joint Convention and enhancing efficiency of its application, as well as recommendations on revision of the relevant procedural documents of the Joint Convention were discussed during the meeting. Final proposals on revision of the mentioned documents of the Joint Convention will be submitted for consideration of the Extraordinary Meeting of the Contracting Parties to be held in May 2014 in Vienna, Austria.

***The IAEA mission to review implementation of recommendations of the mission on the integrated regulatory review service (post-mission) performed in November 2009 to assess efficiency of the activities of the state authority for regulation of safety in atomic energy use***

On November 11-19, 2013 an IAEA follow-up mission was performed in Moscow (Russia) to review the activities of the Federal Environmental, Industrial and Nuclear Supervision Service (Rostekhnadzor) as an authorized state safety regulatory authority for atomic energy use in the Russian Federation.

During the follow-up mission a team of managerial experts from the member-states' regulatory bodies and IAEA employees reviewed implementation of recommendations and proposals of the IAEA mission received by the Russian Federation in November 2009, as well as assessed the Rostekhnadzor's activities in the following fields: Emergency Preparedness and Response; Lessons of the Fukushima-Daiichi Accident for the Regulatory Body. A team of IAEA experts pointed out that Rostekhnadzor made significant progress since the previous mission in 2009 in the field of improvement of legislative and regulatory and legal framework with due account taken of the IAEA safety standards, strengthening of authorities and ensuring independence of Rostekhnadzor as a state safety regulatory body, as well as that Rostekhnadzor actively cooperated with federal executive authorities and organizations in elaboration of regulatory documents in the field of atomic energy use.

As a result of the IAEA follow-up mission, recommendations and proposals were

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developed on further enhancement of efficiency of Rostekhnadzor's regulatory activities and best practices were determined, which could be recommended for usage by the other IAEA member states' safety regulators in atomic energy use. Thus in particular the leading role of the Russian Federation in implementation of the international cooperation in strengthening of the global nuclear safety regime, an open dialogue between Rostekhnadzor and regulators from other countries to discuss the best practices and experience in fulfillment of state regulatory functions, as well as availability of the adequate regulatory framework on assessment of the operators' emergency response plans were pointed out as the best practices.

In the framework of the follow-up mission, IAEA experts took part as observers in emergency training in the Information and Analytical Center of Rostekhnadzor as well as in the Novovoronezh NPP and Novovoronezh Branch of FSUE "Emergency Technical Center of Minatom of Russia".

IAEA follow-up mission activities will result in preparation of the report, which will be published on the official IAEA website after final agreement thereof and forwarded to Rostekhnadzor and the RF Government Office.

***Participation in activities arranged under the aegis of the Nuclear Energy Agency of Organization for Economic Cooperation and Development (OECD/NEA)***

*Participation in the activities of the OECD Nuclear Energy Agency's committees.*

The Deputy Chairman of Rostekhnadzor took part in the 126th meeting of the Steering Committee on Nuclear Energy (SC) of the Nuclear Energy Agency (NEA) of the Organization for Economic Co-operation and Development (OECD) on April 25-26, 2013 in Paris, France. It was the first time when Russia took part in the NEA SC as a full member of the Agency. During the 126th meeting of the SC the participants discussed the results of the OECD/NEA activities as well as arranged debates on the topic "Actions taken by the NEA in response to the Fukushima-Daiichi NPP accident". The acting chairman of Rostekhnadzor took part in the 127th meeting of the OECD/NEA SC held on October 24-25 in Paris, France. During the 127th meeting of the SC the participants discussed the results of the OECD/NEA activities as well as arranged debates on reactors' decommissioning.

Rostekhnadzor representatives took part in 2 meetings of the OECD NEA Nuclear Regulatory Committee (NRC) held in Paris, France in 2013 (June and December 2013). The following issues were discussed at the meetings: the activity of the Committee's working groups; the measures taken in the OECD NEA member states in connection with the Fukushima-Daiichi NPP accident.

In the course of the 29th meeting of the NRC held on June 3-4, 2013 a representative of Rostekhnadzor presented information on the recent changes in the structure of legislative and regulatory documents in the field of atomic energy use in Russia; plans on receiving an IAEA follow-up mission in November 2013 to analyze implementation of recommendations of the previous regulatory review mission; as well as on creation of the special section in the Rostekhnadzor's website devoted to the activities carried out following the accident at the Fukushima-1 NPP.

In the course of the 30th meeting of the NRC held on December 2-3, 2013 a representative of Rostekhnadzor presented information on the recent changes in the Russian legislation in the field of arrangement of the safety review as well as the objectives and main outputs of the activities of the IAEA follow-up mission in November 2013.

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A representative of FBE SEC NRS participated in the 5th meeting of the NRC High-Level Target Group on consequences of NPP Fukushima-1 accident held on February 25 - March 1, 2013 in Paris, France. The final draft of the report on the "NEA and its members' actions in follow-up to the Fukushima-Daiichi NPP accident" was prepared at the meeting.

Within the reporting period, representatives of Rostekhnadzor took part in the sessions of the following NRC working groups held in Paris:

- the 2nd and the 3<sup>rd</sup> sessions of the Task Group on Accident Management held on February 20-22 and October 15-17;

- the 10th and the 11th sessions of the Working Group for Regulation of New Reactors held on March 26-27 and October 8-9;

- two sessions of the Working Group on Operating Experience held on April 8-12 and September 16-20;

- two sessions of the Working group on Inspection Practices held on April 22-25 and October 21-24;

- 16th session of the Working Group on Analysis and Management of Accidents held on September 24-27, 2013.

Two sessions of the NRC High-Level Task Group on Characteristics of an Effective Regulator with participation of Rostekhnadzor's representatives were held within 2013. The ultimate objective of the group is to generate a Green Book, a draft publication of the OECD Nuclear Energy Agency on characteristics of an effective regulator by 2014.

A representative of FBE SEC NRS took part as a technical specialist in the 53rd and 54<sup>th</sup> sessions of the OECD NEA Committee on the Safety of Nuclear Installations held on June 6-7 and December 4-5, 2013 in Paris, France.

A representative of Rostekhnadzor took part in the 14<sup>th</sup> session of the Working Group on Human and Organizational Factors of the Committee on the Safety of Nuclear Installations held on March 18-21, 2013 in Paris, France.

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*Participation in activities in the framework of the Multinational Design Evaluation Program.*

3 meetings of the Steering Technical Committee (STC) of the Multinational Design Evaluation Program (MDEP) were held in 2013 in Paris, France and Helsinki, Finland.

The following issues were discussed at the sessions: the activity of the MDEP working groups, information exchange among MDEP members and inside the MDEP working groups on the specific projects, overview of events important in terms of nuclear and radiation safety in the MDEP member-states, interaction of MDEP with other organizations including the NEA NRC working group on regulation of new reactors, MDEP financing. Besides, a Working Group on VVER Reactors was established in 2013 with participation of Russia, India, Finland and Turkey as MDEP associated members.

Within 2013 the representatives of Rostechnadzor took part in the following meetings of the MDEP working groups held in Paris (France):

3 meetings of the Digital Instrumentation and Controls Working Group (DICWG). Activities under Generic Common Position No.11 were completed: "Pre-installation testing and initial on-site testing of digital instrumentation and control systems". As of end 2013, 8 generic common positions of the DICWG were issued, 3 generic common positions are at the early stage of development and 1 draft generic common position No.12 was prepared on the use of automatic (built-in) testing in digital I&C systems for review by the MDEP STC;

Meeting of the Vendor Inspection Working Group. The following issues were discussed during this meeting: inspections conducted in the end of 2012 - 2013, feedback on the inspection results, a plan of future joint inspections, problems of harmonization of requirements for suppliers. Rostechnadzor's representative provided information under the topic "General Requirements to the Contents of the Quality Assurance Program (QAP) for NPP Equipment Manufacturing"; 2 meetings of the Codes and Standards Working Group (CSWG). The main results of activities in 2013 comprised completion of the following documents: Generic Common Position: Findings from Code Comparisons and Establishment of a Global Framework towards Pressure-Boundary Code Harmonization; Technical Report: Lessons Learnt in Achieving Harmonization of Codes and Standards for Pressure Boundary Components in Nuclear Power Plants; Technical Report: The Fundamental Attributes for the Design and Construction of Pressure Boundary Components.

*Participation in activities carried out within CIS*

In 2013 representatives of Rostechnadzor took part in the activities of the following working groups of the Commission of CIS member-states in the field of atomic energy use for peaceful purposes (hereinafter referred to as the Commission):

expert group for coordination of fulfillment of the Primary Action Plan on implementation of the Frame Program on Cooperation of CIS Member-States in Peaceful Use of Atomic Energy for the Period up to 2020 "Cooperation "Atom - CIS" (hereinafter referred to as the Primary Action Plan); working group for formation of a comprehensive system to maintain safety of research nuclear installations and the aspects related to formation of the CIS Countries' Research Reactors' Coalition;

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working group for development of main elements of the Concept for ensuring nuclear, radiation and radioecological policy of CIS member-states;

working group for harmonization of regulatory-legal and regulatory-technical framework of the CIS member-states in the field of peaceful use of atomic energy.

Participation in the activities of the aforementioned working groups of the Commission in 2013 comprised review and agreement of the following draft documents of the Commission by the experts of Rostekhnadzor and its technical support organizations: Report on the Commission activities in 2009-2012, Primary Action Plan for 2013; Agreement on Coordination of CIS Member States International Relations in the Field of Atomic Energy Use for Peaceful Purposes (signed during the Meeting of the CIS member-states' government leaders on May 31, 2013 in Minsk); Concept on establishment of the intergovernmental integration center for collection and analysis of information and methodological support of normative-legal and normative-technical regulation in the field of peaceful use of atomic energy; Provisions for the basic organization of the CIS member-states in terms of information exchange in the field of safety assurance of nuclear research installations of the CIS member-states (approved in the course of the meeting of the CIS government leaders on May 31, 2013 in Minsk); Provisions for the Commission's website, etc.

A representative of FBE SEC NRS on behalf of Rostekhnadzor took part in the 14th meeting of the Commission held in Electrostal, Moscow Region, on October 9, 2013. In the course of the meeting the members of the Commission exchanged information about implementation of the decisions of the 13th meeting of the Commission, they discussed the proposals on the ways of implementation of the Agreement on Coordination of CIS Member States International Relations in the Field of Atomic Energy Use for Peaceful Purposes.

### ***Participation in activities in the framework of the VVER Regulators Forum***

The 20th annual meeting of the VVER Regulators Forum was held on December 11-13, 2013 in Kanyakumari, India. The delegation of Rostekhnadzor headed by the Service's Acting Chairman took part in the meeting. During the meeting the Service's Acting Chairman presented a report on the most significant events in the field of nuclear and radiation safety regulation in Russia in 2012-2013; he made special emphasis on the results of the IAEA follow-on mission performed in November 2013 in Moscow to assess efficiency of Rostekhnadzor's activities as a state authority for regulation of safety in atomic energy use.

The Russian delegation also presented information on the most important and interesting events from the safety viewpoint occurred at the Russian NPPs with VVER type reactors within the mentioned period. In 2013, Rostekhnadzor prepared a draft final report of the VVER Forum Working Group on determination of requirements for manufacturing quality and analysis of safety for operation of VVER NPP nuclear fuel including the requirements for verification of calculation programs coordinated by Russia. The results of the Working Group activities and the draft report were presented at the meeting. As a result of the meeting, the decision was taken to establish two new working groups in the framework of the VVER Regulators Forum on analysis of the reactor physics and safety regulation during commissioning of new builds, as well as to extend the credentials of the Working Group on Probabilistic Safety Analysis. The next meeting of the Forum will take



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place in Helsinki, Finland (preliminarily in June 2014) under the chairmanship of the Nuclear and Radiation Safety Center of Finland (STUK).

### ***Cooperation in the framework of G8***

3 meetings of the working group for nuclear safety and security were held in London under the Great Britain chairmanship in 2013: on March 13-14, May 2-3 and October 30-31. The Russian Federation delegation headed by Rostekhnadzor and made up of Ministry of Foreign Affairs and State Corporation Rosatom representatives participated in the above events.

### ***Participation in other activities (assemblies, conferences, symposia, workshops, exhibitions, etc.) pertaining to the jurisdiction of Rostekhnadzor***

The delegation of Rostekhnadzor headed by the acting Chairman took part in the second European Conference on Nuclear Safety on June 9-13, 2013 (Brussels, Belgium). The conference was organized by the European Nuclear Safety Regulators Group (ENSREG). The main topics for discussion at the plenary meeting and 4 topical sessions encompassed the state of nuclear safety in Europe two years after the Fukushima-Daiichi NPP accident, as well as results of additional NPP safety analyses, particularly the national action plans on nuclear safety and practical implementation thereof. During the opening session the Rostekhnadzor's acting chairman presented a report on the "Lessons learned from the NPP Fukushima-Daiichi accident and the actions of the Russian regulator".

Representatives of Rostekhnadzor, FSUE VO "Safety" and FBE SEC NRS took part in the annual conference "Eurosafe" held on November 4-5, 2013 in Cologne, Germany. The conference consisted of the plenary session and four workshops on the following topics: "Waste management and decommissioning", "Safety of nuclear installations: assessments and research", "Nuclear security of nuclear installations and nuclear materials", "Radiation safety, environment and emergency preparedness".

## ***Bilateral Cooperation***

### ***Cooperation with the USA***

#### ***Cooperation with the US Nuclear Regulatory Commission (NRC)***

On March 12-14, 2013 the delegation of Rostekhnadzor took part in the Conference on exchange of regulatory experience annually arranged by the US NRC. The Rostekhnadzor's deputy chairman spoke at the conference session "International coordination of capacity building: support in assurance and regulation of nuclear safety to the countries with new and developed nuclear power programs" with the presentation on "Support rendered by Rostekhnadzor to the nuclear safety regulators of the countries planning to construct an NPP based on the Russian project: status and perspectives".

Two delegations of the US NRC headed by the US NRC commissioners visited Russia on June 26- July 6, 2013 (on June 26-29 and June 29 - July 6). Meetings with the management of the Leningrad NPP, Leningrad NPP-2, Leningrad Branch of FSUE RosRAO including visits to the mentioned nuclear facilities were arranged during the visit of the first delegation on June 27, 2013. Meetings in Moscow with the management of Rostekhnadzor and the directorate of FBE SEC NRS (on July 1)

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as well as familiarization visits to the fourth power unit of the Beloyarsk NPP (on July 3), JSC Izhora Works in Kolpino (July 4) and the Petersburg Nuclear Physics Institute named after B.P. Konstantinov (July 5) were held in the framework of the visit of the second delegation.

Efforts were continued in 2013 to endorse the draft interdepartmental Agreement on cooperation in the field of safety regulation in peaceful use of atomic energy with the concerned Russian ministries, departments and the US NRC.

*Activities on implementation of Agreements on Cooperation with the US Department of Energy (DOE) in the field of nuclear material control and accounting and physical protection.*

A meeting of the Joint Coordination Committee (JCC) was held on February 18-19, 2013 in Vienna, Austria in the framework of the interdepartmental agreement between Rostekhnadzor and the US DOE on control, accounting, and physical protection of nuclear materials. During the meeting the participants reviewed the results of bilateral cooperation within 2012 and discussed the issues related to planning of activities for 2013 in the framework of joint projects in the following areas: improvement of guidelines and methodical documents; training and refresher of Rostekhnadzor territorial bodies inspectors; improvement of measurement techniques, maintaining operability of engineered features for nuclear material control; nuclear security culture, etc.

The Government of the Russian Federation and the Government of the United States of America signed the Report on June 14, 2013 in Washington D.C., USA to the Frame Agreement on the Multilateral Nuclear Environmental Programme in the Russian Federation of May 21 of 2003, which superseded the interdepartmental agreement on cooperation in the field of improvement national systems of nuclear material control, accounting and protection of 1995 and has become a new legal basis for bilateral cooperation between Rostekhnadzor and the US DOE.

Within the year, 4 meetings of the joint project group consisting of Rostekhnadzor's employees and US DOE representatives were held in Moscow to discuss execution of activities in the framework of cooperation in the field of accounting, control and physical protection of nuclear materials, radioactive substances and radiation sources, in particular, on improvement of the supervisory activities and regulatory documents in the mentioned area.

### ***Cooperation with Germany***

*Activities on implementation of the Agreement with the BMU on cooperation, exchange of information and experience in licensing, supervision and review of nuclear and radiation safety.*

According to the Action Plan in the framework of the bilateral cooperation between Rostekhnadzor and the Federal Ministry for the Environment, Nature Conservation and Reactor Nuclear Safety of Germany (BMU) agreed on February 7, 2013 at the annual meeting on discussion of the workshops' program in Moscow, Russia, workshops and working meetings on the following topics were held in 2013:

"National and international aspects of licensing and supervision during decommissioning of nuclear installations, as well as practical issues related to decommissioning" (Berlin, Stade, Germany, March 18-22, 2013);

"Physical protection of nuclear materials against thefts and hazards related to release of radioactive substances or direct radiation caused by persons provided with

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the access rights (insiders), draft concepts and arrangements" (Yerevan, Armenia, September 9-13, 2013);

"Strategies and methods of decommissioning and rehabilitation of the mining industry legacy facilities with high concentrations of natural radionuclides (NORM) and assurance of radiation safety in the industries with NORM" (Tashkent, Uzbekistan, December 16-20, 2013).

A bilateral meeting between Rostekhnadzor's and FBE SEC NRS' representatives and the delegation of the Society of Nuclear Installations and Reactors Safety (GRS) headed by prof. F.-P. Weis, new GRS scientific and technical director, was held in Moscow on January 29, 2013. During the meeting the parties exchanged information on the current tasks of GRS and Rostekhnadzor, as well as on results of the national stress tests of NPPS and discussed the prospects of cooperation in the framework of the Agreement between BMU and Rostekhnadzor on cooperation, exchange of information and experience in the field of licensing, supervision and assessment of nuclear and radiation safety dated May 9, 2003. The representatives of FBE SEC NRS and the representatives of GRS signed the Memorandum of Intent on arrangement of scientific and technical cooperation in the field of nuclear and radiation safety for the period within 2013-2015.

On the invitation of the Society of Nuclear Installations and Reactors Safety (GRS), Rostekhnadzor's delegation headed by the Acting Service Chairman took part in the bilateral meeting on exchange of information and experience in assistance to safety regulatory bodies and their technical support organizations in the countries embarking on their nuclear power programs (Munich, Germany, September 27-30, 2013).

### ***Cooperation with France***

A joint workshop with participation of the French Nuclear and Radiation Safety Authority (ASN) was held in Paris on July 17, 2013 to discuss implementation of regulatory, technical and organizational measures developed on the basis of the stress-test results on enhancement of safety of the Russian and French nuclear power plants. In the framework of this activity the parties with participation of such operators as JSC Concern Rosenergoatom and Electricite de France held detailed discussions on the NPP operators' implementation of the mentioned arrangements as well as on inspection conducted by the regulatory bodies to check fulfillment thereof.

In follow-up of the mentioned workshop, a bilateral meeting with the ASN Director General was arranged on July 18, 2013, in the framework of which a list of priority cooperation areas was agreed comprising discussion of stress tests performance for nuclear fuel cycle facilities, joint inspections of the operating nuclear research installations, safety supervision during operation and recovery of radiation sources, requirements for the NPP seismic resistance margins, approaches to NPP periodical safety assessment during lifetime extension.

On October 1-4, 2013 the specialists of Rostekhnadzor as observers took part in the ASN inspection performed at La Hague (France), a spent fuel (SF) reprocessing factory. The inspection was performed by the inspectors of the ASN regional office in presence of the Russian delegation members. Some part of industrial facilities and equipment being decommissioned and pertaining to initial stages of the SF reprocessing process was the object of inspection. The specialists of Rostekhnadzor also visited the UP2-800 plant (facility control post, SF dry refueling plant, radwaste

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vitrification plant, spent fuel pool) and the UP3 plant (a facility for removal and reprocessing of collected radioactive waste).

On November 11-14, 2013 the specialists of ASN as observers took part in the inspection of FSUE Radon, a radioactive waste management organization (Sergiev-Posad), performed by the Central Interregional Territorial Department for nuclear and radiation safety supervision of Rostekhnadzor. During the inspection the French inspectors got acquainted with the activity of the organization, methodology and regulatory and legal basis for conducting scheduled inspections of Rostekhnadzor, as well as made technical visits to a number of industrial facilities including the radwaste modular storage facility, a radwaste plasma treatment facility, a radwaste combustion facility, a facility for processing liquid radioactive waste by vitrification, a high-activity waste storage facility.

As a result of both inspections the invited party prepared a brief unofficial observation report based on result of the work carried out by the commission, which conducted the inspection.

In 2013 a working meeting was held in Moscow to exchange information on the regulatory and legal basis in the field of investigation of occurrences at nuclear facilities within the framework of the Agreement of cooperation in the field of nuclear safety between the Institute for Radiological Protection and Nuclear Safety of France (IRSN) and FBE SEC NRS. During the meeting FBE SEC NRS and IRSN exchanged information about maintaining of databases on occurrences at nuclear facilities.

### ***Cooperation with the Republic of South Africa***

The first bilateral meeting with the South Africa National Nuclear and Radiation Safety Authority (NNR) was held on November 26-27, 2013 in Capetown (RSA) in the framework of the interdepartmental agreement on cooperation in the field of nuclear and radiation safety regulation in peaceful use of atomic energy signed in September 2012. During the meeting a list of areas for further cooperation was agreed; it comprised development of regulatory documents, supervision during construction of NPP units, licensing of NPP new projects, as well as training and refresher training of the regulator's personnel. In the framework of the visit on November 28, 2013 the delegation of Rostekhnadzor visited the Koeberg NPP, the only NPP being operated in the African continent.

### ***Cooperation with Norway***

*Participation in the activities related to implementation of the Agreement on Cooperation with the Norwegian Radiation Safety Agency (NRSA).*

In 2013, the employees of Rostekhnadzor and FBE SEC NRS took part in two international workshops on coordination of activities of safety regulatory authorities in the field of emergency preparedness and response arranged by the Norwegian Radiation Protection Authority (April 23-25, Washington D.C., USA; December 10-12, Oslo, Norway). The representatives of the nuclear industry and nuclear safety regulators of the USA, Finland, Sweden, Russia, Norway, Iceland and Denmark also took part in these activities. During the workshops the specialists of Rostekhnadzor provided information on the national system of emergency response at the Russian NPPs and the activity of the Rostekhnadzor Information and Analytical Center.

### ***Cooperation with Finland***



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*Meetings and workshops on implementation of the Agreement with the Radiation and Nuclear Safety Authority of Finland (STUK).*

Bilateral cooperation with Finland was carried out according to the Program of cooperation agreed on at the annual meeting (February 5, 2013, Moscow) in the following areas: licensing and safety supervision in management of spent nuclear fuel and radioactive waste; licensing and supervision over NPP nuclear and radiation safety.

On February 26 - March 1, 2013, on invitation of STUK the young specialists of FBE SEC NRS took part in the training courses in operation of the APROS code intended for modeling of stationary, transient and accident modes at NPP units.

In 2013 two workshops were held in Helsinki (on March 21 and September 11) among the Rostekhnadzor inspectors at the Leningrad and Kola NPPs and the inspectors of STUK to exchange information on safety supervision during operation of the Russian (Leningrad and Kola NPPs) and Finnish NPPs as well as exchange information about the events affecting safe operation of NPPs. Rostekhnadzor inspectors presented reports on safety supervision during operation of Leningrad and Kola NPPs in the second half of 2012 and first half of 2013 in the frame of these workshops.

A workshop was held in Helsinki on May 21-23, 2013 on regulation of safety during long-term storage and ultimate disposal of spent nuclear fuel and radioactive waste, peculiarities of licensing and inspection activities pertaining to SF and RW storage facilities being constructed and operated as well as RW disposal facilities being operated.

On May 29, 2013, Rostekhnadzor hosted a workshop to exchange experience in performing the IAEA integrated regulatory review service missions (IRRS missions) in Russian (November 2009) and Finland (October 2012). The representatives of Rostekhnadzor told about implementation of recommendations and proposals of the IRRS mission performed in Russia, particularly those pertaining to changing of the legislation in the area related to the state regulation of nuclear and radiation safety. The Finnish party provided information about preparation and performance of the IRRS mission, implementation of recommendations and proposals given on results of the mission as well as self-assessment of STUK based on the modules "Lessons learned by the regulator from the Fukushima-Daiichi NPP accident" and "Emergency preparedness and response". The representatives of Rostekhnadzor took part in the joint workshop held on June 16-19, 2013 to exchange information about the activities related to modernization of the Russian and Finnish NPPs based on the results of the NPP stress tests performed in Russia and Finland. A technical visit was made to the Loviisa NPP.

A workshop on exchange of experience in inspections of the NPP units being constructed in Russia and Finland was held on September 17-18, 2013 in the Don Interregional Territorial Department for nuclear and radiation safety supervision of Rostekhnadzor (DITD). It was held in the course of the inspection performed by the DITD to check the state of the units of Novovoronezh-2 NPP (NVNPP-2) being constructed. During the visit the STUK delegation visited the first power unit of NVNPP-2. Within the reporting period the employees of Rostekhnadzor on invitation of the Finnish party took part in 2 workshops arranged in the framework of cooperation between STUK and JSC Concern Rosenergoatom: "Technical



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maintenance and programs on testing of mechanical equipment" (February 4-8 at the Leningrad NPP), "Management and storage of low- and medium-level waste at the Olkiluoto NPP" (October 21-25 at the Olkiluoto NPP).

### ***Cooperation with Sweden***

On January 28-31, 2013 Rostechnadzor's representatives took part in the meeting (Stockholm, Sweden) with the Swedish Radiation Safety Agency (SSM) regarding the strategy of supervision over nuclear fuel cycle facilities specializing in management of spent nuclear fuel and radioactive waste of all activity levels. In the framework of the meeting the specialists of Rostechnadzor visited the interim spent fuel storage facilities "Club" and "Studsvik".

### ***Cooperation with China***

The 17th meeting of the Russian-Chinese Nuclear Subcommittee in the framework of the Commission for the Regular Meetings of Heads of Government of Russia and China was held on September 13, 2013 in Moscow, Russia.

The representatives of Rostechnadzor and the National Nuclear Safety Administration (NNSA) of China agreed to arrange a joint meeting in China in the first half of 2014, which would be devoted to exchange of information about the activities being planned, performed and completed taking into account the lessons learned from the Fukushima-1 NPP accident, as well as the aspects related to using of operational experience feedback in regulatory activities. The course of the forthcoming meeting the parties would also determine the topic of the next bilateral meeting to be held in the second half of 2014 in Russia.

### ***Cooperation with the Republic of Korea***

The 16th session of the Russian-Korean Joint Coordination Committee on Nuclear Power (JCC) with participation of the Rostechnadzor representative was held in Moscow, Russia on August 19-20, 2013. The parties discussed the potential possibility of making an Agreement between Rostechnadzor and the Korean Party on cooperation in the field of nuclear and radiation safety regulation in peaceful use of atomic energy.

### ***Cooperation with Japan***

The Memorandum on cooperation in nuclear and radiation safety regulation in atomic energy use for peaceful purposes was signed between Rostechnadzor and the Nuclear Regulation Authority of Japan on September 16, 2013 in Vienna.

The Memorandum envisages the following lines of cooperation: regulatory and legal framework in the field of nuclear and radiation regulation, licensing of activities in the field of peaceful use of atomic energy, supervisory and inspection activities including preparation and implementation of inspection programs, management of radioactive waste and spent nuclear fuel including their transportation and safe storage, physical protection of nuclear installations, radiation sources, storage facilities, nuclear materials and radioactive substances, quality assurance of equipment for nuclear installations, emergency preparedness and emergency response, training of the regulator's personnel.

### ***Cooperation with Turkey***

The first trilateral meeting (Russia - Turkey - OECD NEA) was held in Ankara, Turkey on February 11-12, 2013 on rendering support to TAEK in the course of

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licensing of the Akkuyu NPP with possible coordination by the OECD Nuclear Energy Agency (NEA). The representatives of Rostechnadzor provided the Turkish Party with the information about the process of licensing of nuclear facilities applicable in Russia, safety review in the course of licensing as well as the available experience in rendering assistance to foreign regulatory bodies.

The second working meeting was held in Rostechnadzor on June 10-20, 2013 on rendering support to the Turkish Atomic Energy Authority (TAEK) in the course of the Akkuyu NPP licensing with possible coordination by the OECD NEA. During the meeting the Turkish party was provided with information about the Russian experience in NPP licensing (by the example of Novovoronezh-2 NPP), as well as information about the status of development and revision of federal regulations in the field of atomic energy use. The parties also discussed the aspects related to implementation of the Akkuyu NPP project with participation of the representatives of the Akkuyu NPP JSC, design and engineering branch of JSC Concern Rosenergoatom and JSC Rusatom Overseas. A representative of the Akkuyu NPP JSC presented the similar information on the progress of the Akkuyu NPP project implementation. The minutes of the meeting was signed as a result of discussions, which reflected the nearest steps on further development of cooperation between nuclear and radiation safety regulatory bodies of Russia and Turkey.

On October 28-31, 2013 a workshop was held in Moscow for the TAEK specialists on "Quality control of VVER NPP structural components at the stage of manufacturing". During the workshop the information was provided on arrangement of the quality control system of mechanical equipment, pressurized vessels and other elements important for NPP safety at the manufacturing stage; control of safety important automation and software systems; as well as regulatory inspection of structures and components important to the safety of the NPP, etc.

Visits to JSC ZiO-Podolsk and JSC NPO TsNIITMASH were arranged for the Turkish specialists in the framework of the workshop. During the visit to JSC NPO TsNIITMASH the TAEK specialists also visited INO AtomTechnoTest dealing with certification of the NPP equipment and the Test Center "TsNIITMASH - Test-Atom", where they were made familiar with the activity of a set of laboratories for studying of physical and chemical properties of metals. In the framework of the visit to JSC ZiO-Podolsk they also visited the shop for drilling of steam generators' internals' components and the shop for steam generators' assembly. The personnel demonstrated the assembly procedure to the TAEK specialists as well as provided explanation on the types and methods of testing. Finally the delegation had a meeting with the management of the Podolsk Inspection Office of the Rostechnadzor CITD NRS. During the meeting they were informed about the principles of activities' arrangement and the current activities of the Office in the course of nuclear and radiation safety supervision.

### ***Cooperation with Iran***

On September 9-14, 2013 six representatives of the Atomic Energy Organization of Iran (of the Iranian Nuclear Regulatory Authority being part of the AEOI) took part as observers in the comprehensive inspection of the Rostov NPP safety (operating Units No.1 and No.2) performed by Rostechnadzor.

A group of Iranian specialists was trained on September 9 - November 26, 2013 in the NEI CPE "Training and Methodological Nuclear and Radiation Safety Center"

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(TMC NRS), Moscow and in the Training Center of the Kalinin NPP, Udomlya on regulation of nuclear and radiation safety in the course of the NPP operation.

Besides, during the year the specialists of FSUE VO "Safety", a scientific and technical support organization of Rostekhnadzor, went out to the Bushehr NPP site in Iran to render consulting support to the inspectors of the Iranian Nuclear Regulatory Authority during supervisory activities to check implementation of nuclear safety requirements.

### ***Cooperation with Vietnam***

A representative of FBE SEC NRS took part as consultant in the working meetings on development of regulatory legal documents in the field of atomic energy use by the Vietnam Agency for Radiation and Nuclear Safety (VARANS) held on January 29-31 and April 17-18, 2013 in Hanoi, Vietnam.

The Workshop on "Quality Control of VVER Structural Components at the Manufacturing Stage" was performed on request of VARANS by the representatives of Rostekhnadzor and FSUE VO "Safety" on April 1-4, 2013 in Hanoi. In the framework of the workshop the VARANS specialists were provided with the information on arrangement of the quality control system of mechanical equipment, pressurized vessels and other elements important for NPP safety assurance at the manufacturing stage as well as on regulatory inspection during installation of structures and components important to the safety of the NPP.

On 08.04.2013 the delegation of the Vietnamese Institute of Atomic Energy headed by its president visited Rostekhnadzor. There the delegation was provided with the information on the Russian system for regulation of safety of nuclear research installations. The delegation of the Social Republic of Vietnam consisting of the Minister of Science and Technologies of Vietnam, VARANS Director General and other VARANS representatives visited Rostekhnadzor on 09.04.2013. In the framework of the meeting the participants discussed the issues and prospects of bilateral cooperation in the field of nuclear and radiation safety regulation.

On June 19-21, 2013 the representatives of FBE SEC NRS arranged a training workshop in Hanoi for the VARANS specialists on the Russian experience in application of regulatory legal documents setting forth the requirements for safety in NPP designing and siting.

The Technical Conference on the state control of radiation and nuclear safety as well as the Conference on nuclear safety regulation arranged for the first time in Vietnam were held on July 18-19, 2013 in the province of Haiphong and timed to the 10-year anniversary of the system of state management and regulation of radiation and nuclear safety. The delegation of Rostekhnadzor took part in the mentioned activities on invitation of the VARANS Director General. Rostekhnadzor's representatives made presentations devoted to the Russian experience in safety regulation during NPP siting and conduct of inspections in order to assess safety of the NPPs being operated.

### ***Cooperation with Bangladesh***

The delegation of the People's Republic of Bangladesh headed by the Assistance Secretary of Science and Technologies visited Rostekhnadzor on April 11-12, 2013. The delegation also included the head of the Bangladesh Atomic Energy Regulatory Authority (BAERA). During the meeting the Bangladesh party was provided with

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information on the system of NRS regulation in Russia with the emphasis on licensing of the activities in the field of atomic energy use. After this meeting, the PRB delegation visited FBE SEC NRS, the representatives of which provided it with the information on the Russian requirements for NPP siting, the general information on the activities of SEC NRS as well as demonstrated operation of the software complex "Raduga" applied to model thermohydraulic processes at the NPP in the course of verification of technical decisions used in the NPP project.

A round table "Nuclear power engineering: possibility for successful economic and social and political development" was held on April 29-30, 2013 in Dhaka with participation of a Rostekhnadzor's representative, who made a presentation on the Russian system of nuclear and radiation safety regulation.

### ***Cooperation with the Republic of Belarus***

A session of the Russian-Belarusian working group on nuclear energy engineering infrastructure development in the Republic of Belarus with participation of the Rostekhnadzor representative was held on May 23-24, 2013 in Minsk.

The representatives of the Don Interregional Territorial Department for NRS supervision arranged a workshop on June 10-11, 2013 in Minsk on arrangement and implementation of supervision over construction and installation of NPP confining safety systems.

The delegation of FSUE VO "Safety" made a visit to Minsk on September 2-5, 2013 to discuss and agree on the areas of cooperation with Gosatomnadzor of Belarus during implementation of the National Action Plan of the Republic of Belarus on fulfillment of the IAEA mission recommendations.

The specialists of Gosatomnadzor of Belarus took part as observers in the inspection of the NPP Novovoronezh-2 units' construction conducted by the Rostekhnadzor DITD NRS on September 9-13, 2013. The objective of this activity was to share the Russian experience in arrangement and implementation of the state civil construction supervision at NPPs.

On September 26, 2013 a bilateral meeting was held between the Rostekhnadzor Deputy Chairman and the delegation of Gosatomnadzor of Belarus. The meeting was devoted to discussion of the Russian standard practice of making a review of NPP safety analysis reports. Besides, the meeting participants discussed the aspects related to elaboration of the license validity terms and conditions and the practice of supervision to check fulfillment thereof. Eight specialists of Gosatomnadzor made a scientific visit to FBE SEC NRS in the framework of the IAEA Technical Cooperation Program on October 14-25, 2013. Training was performed under the basic training course program "Regulation of nuclear and radiation safety in atomic energy use". In the framework of this program the Belarussian party was provided with the information on international principles and practices as well as on the Russian approaches to regulation of nuclear and radiation safety including the issues related to licensing, quality management and basic criteria and principles of safety (by example of the VVER NPP). Training was arranged in the form of lectures and practical exercises on the basis of the software complex "Raduga".

On request of Gosatomnadzor, on December 5-6, 2013 a representative of FBE SEC NRS gave lectures to the specialists of Gosatomnadzor and SSI "The Joint Institute for Nuclear and Power Research - Sosny" on the requirements for VVER



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NPP safety analysis. Besides, the information was provided about calculation tools and codes used during VVER NPP safety review. Negotiations were held in Minsk on December 20, 2013, which resulted in signing of the Agreement between the Federal Environmental, Industrial and Nuclear Supervision Service of Russia and the Ministry of Emergency of the Republic of Belarus on cooperation in the field of nuclear and radiation safety regulation in peaceful use of atomic energy.

### ***3.2. International Cooperation in the Field of Industrial Supervision*** *Multilateral cooperation*

#### ***Cooperation with CIS countries***

The XI meeting of the Interstate Council on Industrial Safety (ICIS) with participation of the Rostekhnadzor's delegation was held in Minsk (Republic of Belarus) on September 10-13, 2013. During the ICIS meeting Rostekhnadzor presented information on the arrangement of training and qualification of specialists of the supervised organizations and on the experience in introduction of risk-oriented supervision.

In 2013 in the framework of the Agreement on cooperation in the field of industrial safety assurance at hazardous industrial facilities and ICIS activities, Rostekhnadzor made a comparative analysis of regulatory and legal documents on industrial safety assurance in oil and gas industries and prepared a summary on the circumstances and consequences of man-induced accidents and workers' injuries.

Rostekhnadzor ensured functioning of the ICIS website. The representatives of Rostekhnadzor took part in the following activities:

- workshop "Exchange of experience and methods of arrangement and execution of the government supervision over the state of industrial safety at coal mining industry facilities of CIS countries" (June 18-21, 2013, Prokopjevsk, Russia);

- working meeting in order to hold joint (Tajikistan and Russia) control and preventive inspections at complex hazardous industrial facilities of the oil and gas industry (March 17-23, 2013, Dushanbe, Tajikistan).

In the framework of the Memorandum of Cooperation of the State Energy Supervision Authorities of CIS Member-States and the Action Plan on Coordination of Cooperation of the State Energy Supervision Authorities of CIS Member-States for 2013-2015, two sessions of the Commissions were held in Moscow in 2013.

The participants of the sessions discussed such issues as harmonization of the structure and content of the main regulatory legal documents on the state energy supervision, consistency of tasks and authorities of the state energy supervision bodies. They reviewed the results of approval of the draft Methodological Instructions developed by Rostekhnadzor on inspection of power transmission lines, distribution (switching) stations and transformer substations, the Standard Program on inspection of power transmission lines and the Standard Program on inspection of distribution (switching) stations and transformer substations during inspections of electricity supply network organizations.

#### ***Participation in activities of the Organization for Economic Cooperation and Development (OECD)***

On June 11-13, 2013 the representatives of Rostekhnadzor took part as part of the Russian delegation in the activities of the 50<sup>th</sup> meeting of the OECD Chemicals



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Committee and the Working Group on Chemicals, Pesticides and Biotechnologies (France, Paris).

The information on the "System for prevention of accidents at chemically hazardous industrial facilities" was provided by Rostekhnadzor for further incorporation into the overall presentation of the Russian delegation.

Rostekhnadzor within its jurisdiction prepared information characterizing consequences of changes that had been introduced or would be introduced into the Russian regulatory and legal framework in connection with harmonization of the latter with the OECD recommendations and codes. This information may be found in the comments to the Initial Memorandum on the Position of the Russian Federation in Respect of the Acts of the OECD (section "State regulation in the field of production, trade and chemical substances' and mixtures' handling", subsection "Emergency situations resulting from the usage of chemicals").

***Participation in other activities (assemblies, conferences, symposia, workshops, exhibitions, etc.) pertaining to the jurisdiction of Rostekhnadzor***

On September 19-23, 2013 the delegation of Rostekhnadzor took part in the 9th international scientific and practical conference on "Energy, Ecology and Economy: efficient ways of comprehensive development" (Alushta, Ukraine).

A representative of Rostekhnadzor made a report on the activities related to supervision of thermal power plants, heat-generating plants and networks.

During the conference the parties also discussed the issues being general and specific to each member-state pertaining to the state-of-the-art and ways of development of power engineering as well as issues related to safety of power and mining enterprises.

The delegation of Rostekhnadzor took part in the International Mining Congress on April 15-19, 2013 (Antalya, Turkey). The representatives of Rostekhnadzor got acquainted with the specialized exhibition of the mining industry and took part in discussion of questions raised at technical sessions: "Coal", "Legislation" and "Risk assessment in mining industry".

The delegation of Rostekhnadzor took part in the 4<sup>th</sup> International Forum "Emergency Response as an Element of Safety Assurance in Industry" (Beijing, China). In the course of the technical session "Progress related to mine rescue teams, medical groups and emergency response teams", the head of the Rostekhnadzor's delegation presented a report on the topic:

"Arrangement of inspection and supervision in the coal mining industry of the Russian Federation and the state of the coal industry in the Russian Federation". In the framework of the forum the delegation of Rostekhnadzor met with the management of the State Industrial Safety Supervision of China.

On August 11-14, 2013 the delegation of Rostekhnadzor took part in the 23rd World Mining Congress (Montreal, Canada), where it visited the World Mining Expo 2013, took part in the international symposium "Automation and Robotics in Construction and Mining (ISARC 2013)" as well as in the activities of the session "Russian miner's week in Canada - International mining investment and innovation forum 2013".

The delegation also visited the underground mine Kidd Creek (Ontario), where it got acquainted with the system of the caved area gobbing at deep levels and

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experience of working related to automation with using of the remote access.

On September 16-20, 2013 the representatives of Rostekhnadzor took part in the meeting of the Sectoral Initiative on Equipment for Explosive Environments (Ex-equipment) of the UN Economic Commission for Europe (UNECE) held in Fortaleza (Brazil) to discuss the types of equipment permitted for application in explosive environments of mining, oil producing and oil refining industries, chemical production, etc.

The meeting of the Sectoral Initiative was continued on November 18-20, 2013 in Geneva, Switzerland, where the delegation of Rostekhnadzor took part in the 23rd session of the Working Group of the UN Economic Commission for Europe (UNECE) on the policy in the field of standardization and cooperation in normative regulatory aspects. The representatives of Rostekhnadzor took part in discussion of the problems related to harmonization of the state system for regulation of safety for equipment working in explosive environments, which were developed by the UNECE and may promote convergence of the existing national regulations at the international level.

***Participation in sessions of the interim working group of the Transport Law Committee of the Organization for Cooperation of Railways (OSJD) on the rights of transportation of hazardous cargoes***

A representative of Rostekhnadzor took part in three sessions (Warsaw, Poland, February 17-22, June 16-21 and October 20-25, 2013).

The session participants reviewed the master copy of the Rules for Transportation of Hazardous Cargoes of Appendix 2 to the Agreement on International Railway Cargo Communication "Rules for Transportation of Hazardous Cargoes" in the revision as of July 1, 2013.

Based on the documents revisions as of 2013, the participants went on reviewing the table "The list of vital differences of Appendix 2 to the Agreement on International Railway Cargo Communication (IRCC)". The following draft documents prepared by the members of the working group and the experts of the Transport Law Committee were adopted during the sessions: changes and amendments to update Appendix 2 to IRCC "Rules for Transportation of Hazardous Cargoes";

revised table "The list of vital differences of Appendix to IRCC";

Action Plan of the Transport Law Committee in the field of Hazardous Cargoes Transportation for 2014.

Participation of Rostekhnadzor in the activities of the OSJD Transport Law Committee jointly with the representatives of the Ministry of Transport of Russia and JSC RZhD makes it possible at the stages of documents' development to settle the issues related to implementation of requirements for industrial safety at hazardous industrial facilities during handling operations and using of transport vehicles.

***Bilateral Cooperation***

***Cooperation with Austria***

A working meeting of the Rostekhnadzor's delegation with the representatives of the Ministry of Transport, Innovation and Technologies of the Republic of Austria was held in Innsbruck, Austria on April 8-12, 2013.

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The delegation also took part in the workshop of the International Organization for Transportation by Rope (IOTK), visited the specialized exhibition of the rope transport "Interalpin" and got acquainted with the activity of the factory for production of equipment for cable roads.

The workshop participants discussed the possible scenarios of emergency situations during operation of cable roads as well as the measures for preventing thereof.

### ***Cooperation with France***

A working meeting between the Rostekhnadzor's delegation and the management and specialists of the French Technical Service for Supervision over Hoisting Structures and Observance of Transportation Rules (Service Technique des Remontages Mécaniques et des Transports Guidés STRMTG) was held in Grenoble, France on October 7-11, 2013.

During the meeting the head of the Rostekhnadzor's delegation presented information on the structure, authorities and functions of Rostekhnadzor. The Rostekhnadzor's specialists were provided with the information on the major aspects of safety regulation of cable roads and cable cars in France. The representatives of Rostekhnadzor visited the cable road in the village of La Peisay, where they got acquainted with arrangement of activities to ensure safe operation of the cable road with the cable car capable of accommodating and transporting 200 passengers at a time; they also visited the factory for manufacture of cable cars to transport the ROMA passengers for acquaintance with the cable cars' manufacturing processes.

### ***Cooperation with Poland***

The representatives of Rostekhnadzor and the Technical Supervision Department of the Republic of Poland had working meetings in May and October 2013.

During these working meetings the parties exchanged practical experience in the field of inspection and supervision over observance of codes and standards for safe operation of hydraulic engineering structures as well as the information on the regulatory legal documents currently in force.

The delegation of Rostekhnadzor during its stay in Poland visited the WTW factory for manufacture of water power equipment for small hydroelectric power plants, as well as the small hydroelectric power plant "Cieszyn", which is operating the WTW equipment. A working visit was arranged to the hydroelectric pumped storage power plant "Porombka-Zhar", where the Rostekhnadzor's specialists got acquainted with the hydraulic engineering structures, main and auxiliary equipment of the plant and operation of instrumentation and control equipment.

When the Polish delegation was received in Russia, the specialists of the Technical Supervision Department of the Republic of Poland visited the Saint Petersburg Flood Prevention Facility Complex and the Volkhov hydroelectric power plant.

As a result of meetings the parties signed the minutes containing provisions on cooperation in the field of supervision over industrial safety for 2014.

### ***Cooperation with Norway***

The delegation of Rostekhnadzor was sent on a business trip to Stavanger, Norway on October 29 - November 2, 2013 to take part in:

working meeting with the representatives of the Petroleum Safety Authority of the Kingdom of Norway to discuss the aspects of safety supervision of the offshore

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oil and gas production;

Arctic Regulators' meeting;

the conference on "Arctic safety: managing risk in the High North".

During the working meeting the parties exchanged the current information about execution of supervisory activities in the field of industrial safety.

The delegation of Rostekhnadzor acquainted the Norwegian representatives with the information about the changes in the legislation of the Russian Federation related to assurance of industrial safety at hazardous industrial facilities and activities of Rostekhnadzor carried out in this regard within 2013. The parties discussed the list of topics for future discussion in the course of bilateral meetings.

The representatives of Norway, Canada, Greenland, Iceland and Russia took part in the Arctic Regulators' meeting. They also discussed the possibility of arranging cooperation among the authorized bodies for regulation of industrial safety of oil and gas industry facilities in the Arctic region. The head of the Rostekhnadzor's delegation presented a report on functions and authorities of the Russian regulatory body.

During the conference on "Arctic safety: managing risk in the High North" the delegation of Rostekhnadzor became acquainted with the requirements of the Arctic countries' public authorities for the activities of companies involved in oil and gas production, and namely safe execution of activities at the continental shelf of the High North.

### ***Cooperation with Germany***

A meeting between the representative of Rostekhnadzor and the representatives of the Federal Institute for Materials Research and Testing (BAM) being under the jurisdiction of the Federal Ministry of Economics and Technology of Germany was held on November 11-14, 2013 in Berlin, Germany. The representative of Rostekhnadzor got acquainted with the procedure of granting assess for management and compliance assessment of explosive substances established in Germany.

### ***Cooperation with Finland***

A representative of Rostekhnadzor as part of the Russian delegation took part in the 51st session of the Joint Russian-Finnish Committee on the Border Water Systems Use held on September 18-21, 2013 in Helsinki, Finland.

### ***Cooperation with China***

The meeting between the Federal Environmental, Industrial and Nuclear Supervision Service of Russia and the State Industrial Safety Supervision of the People's Republic of China was held on November 27-29, 2013 in Russia to exchange the experience in implementation of inspecting and supervisory activities in the coal mining industry.

During the meeting the parties exchanged information about their functions and authorities, the state of industrial safety at coal mining industry facilities, the practice of supervisory, licensing and permitting activities, the rights of inspectors and their interaction with the representatives of the supervised facilities. Besides, the parties discussed certification and refresher training of specialists in the field of industrial safety.

The Chinese delegation visited CJSC "Scientific technical center of industrial safety problems research" (Moscow) and the National Mineral Resources University

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(University of Mines, Saint Petersburg) in order to get acquainted with the research activities carried out to support the coal mining industry.



## ***IV. PERSONNEL POLICY***

### ***Characteristics and analysis of staffing of the Headquarters and territorial departments of the Federal Environmental, Industrial and Nuclear Supervision Service***

#### ***Staffing Status***

According to Resolution of the Government of the Russian Federation No. 137 of February 18, 2013 "On the ultimate staff number and salary fund of federal state civil servants and employees substituting for the positions not assigned to the federal state civil service, the headquarters and territorial bodies of federal executive authorities, as well as on revision and invalidation of some acts of the Government of the Russian Federation", the ultimate number of the employees of the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in 2013 made up 733 persons including 919 positions of the state civil service and 14 positions not assigned to the state civil service as per approved manning schedule.

In 2013, 44 persons were engaged for the state civil service in Rostekhnadzor for the state service positions and 4 persons were engaged for the non-governmental positions. Besides, 12 persons of the technical staff were engaged.

Within 2013, altogether 50 persons including 45 state civil servants were dismissed (36 persons were dismissed on the initiative of the state civil officer - 80%, 4 officers were outplaced - 8.9%, 3 officers were dismissed due to expiration of the fixed-term contract - 6.7%, 1 officer was dismissed due to reduction of the position - 2.2%, and 1 officer was dismissed since the state civil officer was considered not fully capable of labor activities as per medical conclusion - 2.22%). 2 employees substituting for the positions not assigned to the state civil service were dismissed (on their own initiative). 3 persons from the technical staff were dismissed by personal wish.

Thus, the state civil service personnel turnover in 2013 made up 6.4% of the total staff number.

The age distribution of the headquarters' civil servants was as follows: below 30 years - 81 persons (20%);

from 30 to 39 years – 107 persons (26.5%);

from 40 to 49 years – 55 persons (13.6 %);

from 50 to 59 years – 111 persons (27.5 %);

over 60 years – 50 persons (12.4%).

The mean age of the civil servants working in the Headquarters is 44 years.

The sex distribution of the civil servants was as follows: men - 210 persons (52 %); women - 194 persons (48%).

#### ***Arrangement of activities related to staffing of the territorial departments***

According to Resolution of the Government of the Russian Federation No. 137 of February 18, 2013 "On the ultimate staff number and salary fund of federal state civil servants and employees substituting for the positions not assigned to the federal state civil service, the headquarters and territorial bodies of federal executive authorities, as well as on revision and invalidation of some acts of the Government of

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the Russian Federation", the ultimate number of the employees of the territorial bodies of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia made up 7,872 persons as of 01.04.2013. The staff number of the employees of the Rostekhnadzor territorial bodies decreased in 2013 by 12.7% as compared to 2012. The staff number of the employees of the Rostekhnadzor territorial bodies has decreased by 25.5% since 2011. Reduction of the staff number resulted in increase of the actual work load on the Rostekhnadzor inspectors. The staff number of the employees of the territorial bodies carrying out inspecting and supervisory functions as of end 2013 made up 5,805 persons (73.7 % of the total staff number), of which:

the number of employees carrying out industrial supervision functions made up 2,751 persons, whereas the actual number made up 2,501 persons (90.9% staffing, cf. 91.4% as of end of the 1st half-year of 2013);

the number of employees carrying out state energy supervision functions made up 2,097 persons, whereas the actual number made up 1,892 persons (90.2 % staffing, cf. 94 % as of end of the 1st half-year of 2013);

the number of employees carrying out state civil construction supervision functions made up 371 persons, whereas the actual number made up 322 persons (86.7 % staffing, cf. 91.9 % as of end of the 1st half-year of 2013);

the number of employees carrying out nuclear supervision functions made up 586 persons, whereas the actual number made up 481 persons (82.1 % staffing, cf. 83 % as of end of the 1st half-year of 2013).

As of end 2013, staffing of the Rostekhnadzor's territorial bodies made up on an average of 91 %. Incomplete staffing with the civil servants is still mostly characteristic for the interregional territorial departments for nuclear and radiation safety supervision (it makes up 83.9%).

The staff turnover in the Rostekhnadzor's territorial bodies made up 6.5% in 2013 (cf. 9.3% in 2012, 8.2% in 2011, 17% in 2010), which may be explained by reduction of the staff number and conducted organizational and personnel-related activities, non-competitiveness of the monetary allowance of state civil servants as compared to salaries of the supervised enterprises, as well as by lack of specialists in certain professional areas.

#### *Information on qualification of employees and measures taken for employees' professional development*

In general, civil servants of the Rostekhnadzor's headquarters and territorial bodies have the required professional education, professional experience and the record of civil service complying with the requirements of the legislation on the civil service. Thus, 99.7% of civil servants have received professional education; 96.6 % of civil servants have higher education in the specialties corresponding to the functions and specific tasks imposed on Rostekhnadzor on the whole and its structural divisions in particular (as per replaceable positions). About 70 % of this number have higher technical education, 6 % have higher legal education, 2 % have higher education in the speciality of state and municipal administration. 3.3% of employees have secondary vocational education. 0.7 % of employees have the academic degree of PhD, 0.04 % have the academic degree of Doctor of Sciences.

17.6 % of civil servants have served in the supervisory bodies for 15 years and more; 20.1 % have served from 10 to 15 years; 30.8 % have served from 5 to 10 years;

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24.7 % have served from 1 to 5 years; and the record of service of 6.8 % of employees is less than 1 year.

20.7 % of employees have their record of civil service from 15 years and more; 19.8 % have served from 10 to 15 years; 31.4 % have served from 5 to 10 years; 22.3 % have served from 1 to 5 years; and the record of service of 5.8 % of civil servants is less than 1 year.

To enhance efficiency of the federal state supervision in the established sphere of activities in 2013, in the framework of the government order and in compliance with Art. 62 of Federal Law No. 79-FZ of July 27, 2004 "On the Civil Service of the Russian Federation", occupational retraining and refresher training of the Rostekhnadzor's civil servants were arranged.

In the framework of the government order for 2013, 4 federal state educational institutions of higher vocational training and 1 non-governmental educational institution of higher vocational training were involved in training of the state civil servants. Refresher training was carried out based on the following programs:

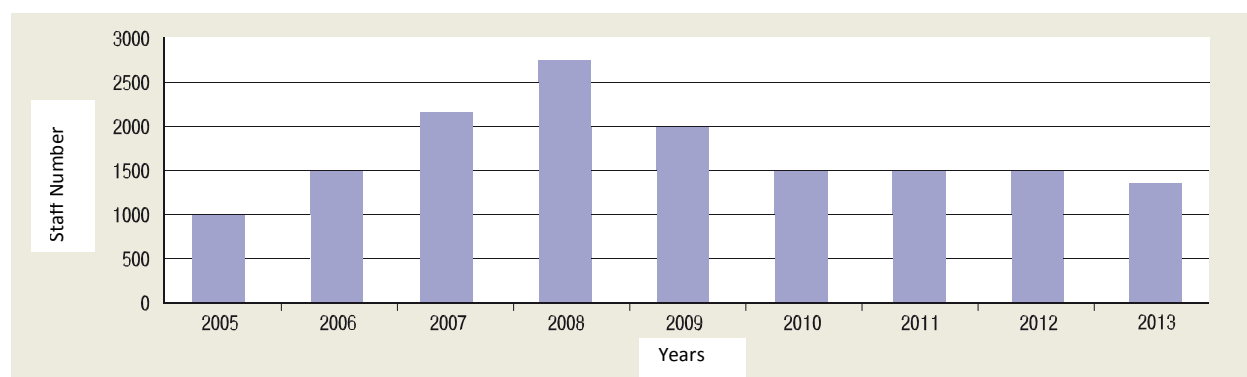
- Contract system in procurement of goods, work and services;
  - Safety of hydraulic engineering structures;
  - Application of legislation on administrative liability in the field of atomic energy use;
  - Exercising of the federal state supervision in the field of atomic energy use;
  - Application of legislation on administrative liability: Report on administrative violation, procedure of generating;
  - Urgent issues of inspecting and supervisory activities;
  - Legal and organizational bases of the government administration and public service;
  - Public service and personnel policy; Public service conflict management;
  - Personnel management technology in government and municipal administrations;
  - Electronic documents for administration (Electronic government);
  - Accountancy at budgetary enterprises;
  - Urgent problems of governmental and municipal administration;
  - Inspecting and supervisory activities in electric power engineering, energy saving;
  - Safety of boiler-operating facilities;
  - Arrangement and implementation of the federal state energy supervision;
  - Technologies of documentation and information support of administration;
  - General issues of industrial safety assurance during operation of hoisting structures;
  - Mining and survey activities;
  - Supervision of explosive and chemical facilities;
  - Transportation of hazardous substances;
  - Supervisory activities over gas distribution and gas consumption systems' facilities;
  - Arrangement and implementation of the state supervision over operation of metallurgical industry facilities;
  - Safety of heat supply networks' heating plants;
  - State civil construction supervision. Sanitary-epidemiological standards and requirements during construction of facilities. Assurance of fire safety of buildings,
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structures and constructions;

Petroleum and gas production facilities' supervision.

The total number of the federal civil servants of Rostekhnadzor who passed training and refresher training in the framework of the government order made up 1,384 persons in 2013. The dynamics in the staff strength of Rostekhnadzor's civil servants who passed training and refresher training within 2005-2013 is shown in Fig. 70.



**Fig. 70.** Dynamics of professional development of Rostekhnadzor civil servants within 2005-2013

The tendency to reduction of the number of trainees in 2009-2013 is explained by reduction in the amount of funds provided for in the federal budget for the specified years.

Training was arranged in 3 cities of the Russian Federation (Moscow, Saint Petersburg, Krasnodar).

3 civil servants passed refresher training in the framework of the government order in 2013 (a 500-hours training course) under the subject areas "Management of personnel in the state civil service system" (1 person) and "State and municipal administration" (2 persons).

Refresher training of Rostekhnadzor's civil servants was accomplished in 2013 at the expense of the funds allocated to the Ministry of Labor and Social Development of the Russian Federation in the following areas:

Functions executed by divisions of personnel departments of federal state bodies to prevent corruption or other offenses;

Aspects related to improvement of quality of the services delivered (remotely);

Government programs of the Russian Federation and project-based control during implementation thereof;

Training of managerial personnel in attraction of investments;

Issues related to introduction of new personnel-related technologies at the public service;

Arrangement of open data management in governmental bodies;

Information and analytical technologies and means in support of managerial decision-making.

Altogether 74 state civil servants of Rostekhnadzor passed training and refresher training at the expense of the funds allocated by the Ministry of Labor and Social Development of the Russian Federation in 2013.

One civil servant of Rostekhnadzor passed vocational refresher training under the

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program "Training program to ensure perspective level of the managerial staff reserve" in the framework of the Federal Program "Training and refresher training of managerial staff (2011-2015)".

Altogether, 1,462 civil servants of Rostekhnadzor passed additional vocational training in 2013.

### *Arrangement of staffing activities*

To ensure engaging of most qualified specialists to the civil service and pursuant to the law of the civil service, the Commissions were functioning in the Rostekhnadzor's headquarters and its territorial bodies (territorial departments) in 2013 to arrange for the competition for the vacant position in the civil service.

The competition for substitution of vacant positions in the Federal Environmental, Industrial and Nuclear Supervision Service of Russia is conducted in accordance with Federal Law No. 79-FZ of July 27, 2004 "On the civil service of the Russian Federation", Decree of the President of the Russian Federation No.112 of February 1, 2005 "On the competition for substitution of a vacant position of the state civil service of the Russian Federation" (decrees of the President of the Russian Federation No.82 of January 22, 2011 and No. 208 of March 19, 2013) and the Procedure for conducting a competition for substitution of a vacant position in the federal state civil service of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia approved by Rostekhnadzor Order No. 907 of November 20, 2008 (orders of Rostekhnadzor No.500 of September 5, 2011 and No.265 of April 25, 2012). The competitive commission acting on a regular basis arranged 12 sessions in 2013.

Within the reporting period, competitions for substitution of 14 vacant positions of the federal civil service were announced. Besides, 4 positions of the state civil service were opened in 2012.

A competition for substitution of one vacant position was not conducted for the lack of the candidates' applications; the second stage of the competition for two vacant positions will be conducted in 2014.

58 citizens expressed their willingness to participate in the competition 2013; four of them failed to comply with qualification requirements imposed for substitution of the vacant position.

66 persons were allowed to participate in the second stage of the competition (93.1%), 12 of them got the authorization in 2012.

54 candidates took part in the second stage of the competition conducted in the form of individual interview within the reporting period:

3 candidates didn't come to the interview;

the second stage of the competition for 9 candidates will take place in 2014.

It was admitted that 50 candidates passed the second stage of the competition conducted in 2013 (92.5% of the total number of competitors participating in the second stage of the competition).

4 citizens failed the competition (8% of the total number of participants in the second stage of the competition).

As a result of the competitions, 37 candidates were enrolled into the Rostekhnadzor's staff reserve including one competition winner, who refused appointment to the vacant position.

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According to Order of the President of the Russian Federation No. SS-P42-4912 of August 25, 2009, activities were arranged in relation to the Federal Managerial Staff Portal. Within 2013 Rostekhnadzor published the information about 398 open vacancies in the managerial staff portal. 21 candidates replied thereto; 2 of these candidates were invited to participate in the competition.

According to Federal Law No. 79-FZ dated 27.07.2004 "On the civil service in the Russian Federation", Decrees of the President of the Russian Federation No.111 of January 1, 2005 "On procedure of passing qualification examination by civil servants of the Russian Federation and assessment of their knowledge, skills and abilities (professional level)" and No. 111 of February 1, 2005

"On procedure of assignment of class ranks of the state civil service of the Russian Federation to the civil servants and maintaining of ranks", 83 civil servants of the Rostekhnadzor Headquarters were assigned with the state civil service class rank in 2013.

The rank of the 1 class full state councilor of the Russian Federation was assigned to one civil officer of the Rostekhnadzor Headquarters (Decree of the President of the Russian Federation No. 770 of October 7, 2013).

59 civil servants of the headquarters and the territorial bodies of Rostekhnadzor occupying main positions were assigned with the class rank of a state councilor of the Russian Federation of classes 3, 2 and 1 (decrees of the Government of the Russian Federation no. 791-r of May 15, 2013, No. 1199-r of July 15, 2013, No. 1355-r of July 31, 2013, No. 1868-r of October 12, 2013, No. 2046-r of November 6, 2013, No. 2343-r of December 11, 2013).

78 federal civil servants of the Headquarters were certified in 2013. As a result of certification all civil servants were considered as fit to the substituted civil job position, of which 2 civil servants of the headquarters were incorporated into the staff reserve for substitution of a civil service vacant position according to one's professional growth.

Certification committees are constantly functioning in all territorial departments of Rostekhnadzor.

According to Federal Law No. 79-FZ dated 27.07.2004 "On the civil service in the Russian Federation", Decrees of the President of the Russian Federation No.310 of April 9, 1997, No. 763 of April 25, 2006 "On the monetary allowance for federal civil servants" and No. 1532 of November 19, 2007 "On calculation of the length of the state civil service in the Russian Federation for establishing a monthly increment to the official salary of the civil servants of the Russian Federation for the long record of service in the Russian Federation, determining the period of the annual additionally paid holiday for the long record of service and the amount of the incentive payments for the honorable and efficient state civil service in the Russian Federation", 4 sessions of the committee were held in 2013 in relation to incorporation of the work periods enabling obtaining of a monthly increment to the official salary for the long record of service into the length of the state civil service of federal state civil servants of the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia. As a result of the committee's activities, the monthly increment to the official salary for the long record of service was established for 80 civil servants in the amount from 10 to 30% of the official salary. Scheduled activities were performed in 2013 on awarding of long service

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pensions and incorporation of any other work periods into the length of the civil service to enable awarding of long service pensions for the former state civil servants of the territorial bodies and the headquarters of Rostekhnadzor.

150 nominations for award of a long service pension for federal civil servants were issued and submitted to the Pension Fund of the Russian Federation.

15 nominations for incorporation of other work periods into the length of the civil service were prepared and submitted to the Ministry of Labor and Social Protection of the Russian Federation to enable award of a long service pension.

In pursuance of Decrees of the President of the Russian Federation No. 781 of October 17, 2013 "On an increase in monthly salaries of persons substituting for the positions of the federal state civil service" and Resolution of the Government of the Russian Federation No. 912 of October 12, 2013 "On an increase in the amount of the official salaries of the employees of federal state bodies substituting for the positions not assigned to the positions of the federal state civil service", activities were carried out in Rostekhnadzor to ensure an increase in the official salaries of the employees of the Rostekhnadzor's headquarters and territorial bodies.

In 2013, 10 civil servants of Rostekhnadzor and its subordinated organizations were awarded to the national rewards of the Russian Federation for their conscientious work, faultless and efficient civil service (4 persons were awarded an Second Class Order "For the Service to Homeland", one person was awarded a Certificate of Honor of the President of the Russian Federation, 2 civil servants were appointed honorary titles "Honored Power Engineer of the Russian Federation", 3 persons were awarded a Commendation of the President of the Russian Federation), 919 employees were encouraged with departmental awards of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia, 25 persons were awarded a Commendation of Rostekhnadzor.

5960 civil servants of Rostekhnadzor were encouraged with departmental awards of other ministries and departments (18 officers were encouraged with awards of the Ministry of Energy of Russia, 8 officers - with departmental awards of the State Atomic Energy Corporation "Rosatom", 4 officers - with departmental awards of the Ministry of Regional Development of the Russian Federation, 16 officers - with departmental awards of the Federal Department for Safe Storage and Disposal of Chemical Weapons, 14 officers - with departmental awards of the Ministry of the Russian Federation for Civil Defense, Emergency Management and Natural Disasters Response).

In 2013, 35 internal investigations were performed for breaches of discipline, i.e. for failure to fulfill or inadequate fulfillment of job functions by the Rostekhnadzor's officials through their fault; these investigations resulted in disciplinary penalties applied to 4 civil servants of the headquarters and 12 deputy heads of the Rostekhnadzor territorial bodies.

Presentations of public prosecution bodies, the results of comprehensive, test and topical inspections of territorial bodies, inspections related to violations during inspecting and supervisory activities, as well as the results of reviewing the applications of citizens and organizations mainly served as the basis for internal investigations.

638 internal investigations in relation to civil servants of territorial bodies were performed by the Rostekhnadzor territorial bodies in 2013; these investigations

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resulted in imposing disciplinary penalties on 656 civil servants.

*Activities of the Commission on complying with requirements for the on-duty behavior of state civil servants of Rostekhnadzor and settlement of a conflict of interests*

The activities of the Commission on complying with the requirements for the on-duty behavior of the state civil servants of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia and settlement of a conflict of interests (hereinafter referred to as the Rostekhnadzor's Commission) are carried out in accordance with the Provisions for the Commission on complying with the requirements for the on-duty behavior of the state civil servants of Rostekhnadzor and settlement of a conflict of interests approved by Rostekhnadzor Order No. 693 of August 10, 2010 (the order was registered by the Ministry of Justice of the Russian Federation on October 24, 2014 under registration No. 18545). The membership of the Commission of the Rostekhnadzor Headquarters was approved by Rostekhnadzor Order No. 850 of August 31, 2010.

In 2013, the Rostekhnadzor Commission held 9 sessions and reviewed: 11 applications pertaining to either giving one's consent for substitution for a position in a commercial or non-commercial organization or execution of a job subject to the conditions of the civil law contract (for which 11 consents were given and 0 were rejected);

2 applications on the impossibility of providing the information on the income, property, property-related commitments of a civil officer for his spouse or under-age children;

1 application on the possibility of a conflict of interests in the situation when a spouse, son or brother of a civil officer is substituting for the position in the organizations supervised by Rostekhnadzor.

Measures were taken to change the functions and authorities exercised by the civil officer in the framework of his/her functional duties.

The activity of the Commission of the Rostekhnadzor's regulatory bodies on compliance with the requirements for the on-duty behavior of state civil servants and settlement of a conflict of interests (hereinafter referred to as the Commission of the Rostekhnadzor's regulatory bodies) is carried out in accordance with the Procedure for generation and functioning of the commissions of the territorial bodies of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia on compliance with the requirements for the on-duty behavior of federal state civil servants and settlement of a conflict of interests approved by Rostekhnadzor Order No. 85 of February 25, 2011 (the order was registered by the Ministry of Justice of the Russian Federation on April 1, 2011 under registration No. 20381). The commissions of the Rostekhnadzor territorial bodies have been established and are functioning in all territorial bodies of Rostekhnadzor.

In 2013, the Commission of Rostekhnadzor's territorial bodies held 424 sessions and reviewed:

293 applications pertaining to either giving one's consent for substitution for a position in a commercial or non-commercial organization or execution of a job subject to the conditions of a civil law agreement (for which 285 consents were given and 8 of which were rejected);

8 materials pertaining to compliance with the requirements for the on-duty behavior (non-compliance with the requirements for the on-duty behavior was

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confirmed in 2 cases, in 6 cases non-compliance with the requirements for the on-duty behavior was not confirmed); 21 materials pertaining to compliance with the requirements for settlement of a conflict of interests (the possibility of a conflict of interests was found in 5 cases, in 16 cases the conflict of interests was not ascertained).

13 materials pertaining to compliance with the requirements for impartiality and soundness of reasons for the failure to submit the information on the income of a spouse and under-age children (in all cases the reason for non-submitting of the information was considered as sound).

The sessions of the Commissions of the Rostekhnadzor's territorial bodies resulted in imposing disciplinary penalties on 21 civil servants of the Rostekhnadzor territorial bodies.

*Certification of managers and specialists of the organizations supervised by the Federal Environmental, Industrial and Nuclear Supervision Service of Russia*

According to Rostekhnadzor Orders No. 37 of January 20, 2007 "On procedure of training and certification of employees of the organizations supervised by the Federal Environmental, Industrial and Nuclear Supervision Service of Russia" (registered by the Ministry of Justice of the Russian Federation on March 22, 2007 under registration No. 9133) and No. 591 of July 12, 2010 "On arrangement of activities of certification commissions of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia". The Rostekhnadzor Central Certification Commission carried out the following activities.

In 2013 the Rostekhnadzor Central Certification Commission (CCC) arranged 64 meetings on primary (periodical) certification; 4,254 specialists were certified. The CCC Secretariat issued 2,364 reports and 5,546 certificates.

According to the requirements of the mentioned regulatory legal acts, record of information about accidents and fatal casualties was arranged in the State Service and Personnel Department of the Rostekhnadzor Headquarters.

After performing investigations to find out the causes of an accident or a fatal casualty as well as those guilty for the accident, the managers of the Rostekhnadzor territorial bodies should submit the information on the persons subject to non-scheduled (extraordinary) certification to the CCC. Based on the analysis of the received information and proposals of the Rostekhnadzor Headquarters' Departments, the CCC Secretariat should build a schedule of the extraordinary certification.

In 2013 based on the results of investigation of the accident causes the managers of the Rostekhnadzor territorial bodies nominated 340 managers and specialists guilty of the occurred incidents or fatal accidents to extraordinary certification; 35 specialists of this number were dismissed or downgraded as a measure of administrative pressure imposed by local regulatory acts of the organization's managers, 139 specialists were sent for extraordinary certification in the CCC, and 125 specialists were sent to the territorial certification commissions of Rostekhnadzor (TCC).

According to the schedules of the extraordinary certification, the Central Certification Commission held 59 sessions in 2013. 99 specialists were subjected to extraordinary certification based on results of investigation on the causes of accidents and fatal casualties occurred in 2012 and 125 specialists - based on results

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of investigation of the events in 2013; 24 of which were subjected to extraordinary certification after repeated examination of knowledge.



## ***V. INFORMATION AND TECHNICAL SUPPORT OF THE ACTIVITIES***

When Rostekhnadzor was founded in 2004, it inherited a number of independent information systems for automation of specific types of main and supporting activities (AIS PB, RAIS, AIS YaRB, etc.). The mentioned information subsystems developed approximately 10 and more years ago are not interrelated and they no longer meet the state-of-the-art information and process needs of the federal executive authority in the 21st century.

In this connection, since 2009 according to the Concept of Rostekhnadzor's Informatization approved by Rostekhnadzor's Order No. 902 of September 15, 2010 and the departmental analytical program "Formation of information and technological infrastructure of the industrial safety assurance system" approved by Rostekhnadzor's Order No. 698 of December 23, 2011, in order to resolve the information support problems and arrange for the unified information space in the Rostekhnadzor's system the Integrated Informatization and Automation System of Activities (IIS of Rostekhnadzor) is being currently developed, which will enable creation of the unified information space and ensure informational integration of administrative and management process at all levels.

IIS of Rostekhnadzor is aimed at arrangement of information interaction among the Rostekhnadzor Headquarters and its territorial bodies both with each other and with other federal executive authorities, executive authorities of the Russian Federation subjects (through the interdepartmental digital interface system, IDIS) and supervised organizations. IIS of Rostekhnadzor ensures automation of main and managerial activities over the whole territory of the Russian Federation with the access valid 24 hours/day 365 days/year.

Efforts went on in 2013 to develop the Rostekhnadzor IIS, the developed subsystems were introduced by stages, commercial operation of earlier developed information subsystems of the Rostekhnadzor IIS was continued.

### *Subsystem "Permits"*

In 2013, the IIS subsystem "Permits" was put into continuous operation to enable automation of the function related to issue of permits for the use of technical devices at hazardous industrial facilities in the Rostekhnadzor headquarters. 1,945 permits were issued by means of this system in 2013. Besides, a unified data base on the permits issued by Rostekhnadzor since 1999 was formed.

According to it.6 of article 1 of Federal Law No.22-FZ of March 4, 2013 "On introduction of changes into the Federal Law "On Introduction of Amendments into Federal Law "On Industrial Safety of Hazardous Production Facilities", Specific Legislative Acts of the Russian Federation and on Invalidation of Subitem 114 of Item 1 Article 3333 of the Second Part of the Tax Code of the Russian Federation" in Article 7 of Federal Law no. 116-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities", the state service related to issuing of permits for the use of technical devices at hazardous industrial facilities was canceled and the operation of the IIS subsystem "Permits" was discontinued accordingly.

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*Subsystem "List of energy generation facilities and hydraulic engineering structures"*

In 2013, the IIS Subsystem "List of EGF/HES" was put into commercial operation by Order of Rostekhnadzor No. 162 of April 18, 2013. Concurrently with introduction of the IIS subsystem "List of EGF/HES" into commercial operation, migration of the data on the energy generation facilities and hydraulic engineering structures took place from other information systems of Rostekhnadzor into this IIS subsystem followed by verification of data.

*Subsystem "Inspecting and supervisory activities"*

In 2013 development of the Rostekhnadzor IIS subsystem "Inspecting and supervisory activities" was completed; trial operation of the mentioned subsystem was conducted in the Yenisei, North-Western, central and Interregional Process Departments of Rostekhnadzor. The subsystem was revised taking into account the comments and proposals received from the mentioned territorial bodies.

The mentioned subsystem is to be introduced in all territorial departments of Rostekhnadzor in 2014.

*IIS subsystem "Emergency and injury rates"*

To provide for the training of the employees of the Integrated Dispatching Office and the territorial bodies of Rostekhnadzor on the operation of the subsystem "Emergency and injury rates" of the Rostekhnadzor's IIS, a trial operation of the mentioned subsystem was performed in 2013 by means of the IIS test bench.

The subsystem was put into commercial operation in all territorial departments and the headquarters of Rostekhnadzor in the beginning of 2014.

*IIS Subsystem "Document Circulation"*

Activities were continued in 2013 in relation to development and introduction of the IIS subsystem "Document Circulation". Taking into account the deployment and operation of the mentioned subsystem in the Rostekhnadzor Headquarters in 2012, the IIS subsystem "Document Circulation" was introduced in 28 territorial departments of Rostekhnadzor by means of the virtualization procedure at server capacities of the Rostekhnadzor territorial departments in the departmental data communication network (DDCN). The technical possibility of exchanging the documents and notifications by means of the interdepartmental digital document circulation system (IDDC) was implemented.

*Information subsystem "List of review reports and industrial safety declarations" of the Rostekhnadzor's Integrated Informatization System*

In 2013, the Rostekhnadzor Headquarters completed development of the IIS subsystem "List of review reports and industrial safety declarations" and performed its trial operation. The mentioned subsystem was updated based on the trial operation results and introduced into commercial operation in January 2014.

*Connection to the Interdepartmental Digital Interface System (IDIS)*

According to Federal Law No. 210-FZ of July 27, 2010 "On arrangement of state and municipal services rendering", Rostekhnadzor connected itself to the interdepartmental digital interface system (IDIS).

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To enable providing information to the concerned federal executive bodies, regional executive bodies and local authorities in the framework of the stated Federal Law, Rostekhnadzor operates digital service SID0003625, by which the following information is provided to the IDIS:

- conclusion on the conformance of a constructed, reconstructed capital construction project with the requirements of process regulations and design documentation;

- information on availability of a license for operation of chemically hazardous industrial facilities;

  - a permit for the use of a technical device at hazardous industrial facilities;

  - a license in the field of atomic energy use;

- a document certifying the Rostekhnadzor bodies' agreement on the plant of mining activities development prepared by the mining organization for the period of its involvement in development of reserves to be assigned to off-grade reserves;

- information on availability of a license for operation of explosion and fire hazardous industrial facilities;

- information on availability of a license for production, use, storage or distribution of industrial-purpose explosive materials;

- a report on performed liquidation (preservation) activities signed by the state mining supervision body;

- information on the applicant's membership in the self-controlled organization for the relevant activities with specification of those activities, which affect safety of capital construction facilities and for which the applicant has an authorization certificate, as well as information on suspension, resumption, failure to resume or termination of the validity of a certificate of authorization of the member of a self-controlled organization for the activities affecting safety of capital construction facilities;

- information contained in the mining allotment report certifying the specified limits of the mining allotments;

information on availability of a license for the survey activities; a permit for the use of industrial-purpose explosive materials. Activities were performed aimed at connection of the digital services of a number of federal executive bodies to enable Rostekhnadzor to obtain the information being at their disposal and necessary to Rostekhnadzor's performance of the state services and functions including connection to the services of the Federal Tax Service of Russia, Board of Treasury of Russia, Rosregister, Rosstandard, EMERCOM of Russia, FMBA of Russia, Federal Budgetary Institution "State Registration Chamber with the Ministry of Justice of Russia", Rosaccreditation, Russian Water Resources Agency and Rosprirodnadzor (Federal Service for the Supervision of Natural Resources).

Activities related to updating of the clients' parts of the stated digital services in case they have been changed by the responsible federal executive bodies (updates) are performed on a regular basis. Activities are being performed jointly with the EMERCOM of Russia to arrange for providing of information from the state register of hazardous industrial facilities in the framework of the IDIS.

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The digital services of the constituent entities of the Russian Federation were tested in 2013 (r-information). The information system on "self-testing" was developed; it enabled all concerned regional executive bodies to test the developed services in the automatic mode without direct applying to the Rostekhnadzor's employees, which made it possible to considerably reduce the time and labor content of the mentioned testing as compared to the traditional (manual) method.

In pursuance of the requirements of Decree of the Government of the Russian Federation No. 2415 of December 28, 2011, Rostekhnadzor ensured digital rendering of the state services within its jurisdiction through the Unified Portal for State and Municipal Services (UPSMS) including implementation of stage IV of the plan on transition to digital rendering of the state services and execution of the state functions by federal executive authorities approved by Resolution of the Government of the Russian Federation No. 1555-r of October 17, 2009 (hereinafter referred to as the Plan).

As of end 2013, 8 services of 15 published at the UPSMS were transferred to stage IV of the Plan, 5 services - to stage II of the Plan and 2 services - to stage I of the Plan.

The Ministry of Communications and Informatics (Mincomsvyaz) of Russia and the Ministry of Economic Development of Russia carry out joint activities on transition of the remaining services of Rostekhnadzor to Stage IV of the Plan.

Activities related to updating of the information about the Rostekhnadzor services in the Federal Register of State Services are performed on a continuous basis to enable their subsequent updating in the UPSMS.

Activities have been scheduled to develop a technical description of the service "Receipt and accounting of notification about commencement of specific activities and services' execution by the legal entities and individual entrepreneurs" in order to ensure publishing of the mentioned service in the UPSMS according to the established procedure.

#### *Computer-based information system for safety regulation in atomic energy use (AIS NRS)*

The computer-based information system on safety regulation in the field of atomic energy use (AIS YaRB) was maintained within 2013. Activities on improvement and updating of the AIS YaRB were performed based on the proposals of Departments 2 and 6 of the Headquarters, as well as the proposals of the interregional territorial departments for nuclear and radiation safety supervision (ITD NRS) of Rostekhnadzor.

Modules "Licensing" and "Inspecting" were updated; the reports were generating in accordance with the current requirements of the federal legislation and regulatory legal acts of Rostekhnadzor.

In order to implement Decree of the Government No. 1184 of 19.11.2012, a new functional module of the AIS YaRB "List of organizations carrying out activities related to operation of radiation sources containing only radionuclide sources of categories 4 and 5" was developed and introduced.

174 organizations which submitted relevant applications have been presently registered at the AIS YaRB central server since January 2013.

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To provide for the uniformity of the AIS YaRB version operated in the headquarters and in the territorial offices, in August of 2013 the application software of the mentioned information system was updated in all interregional territorial departments for nuclear and radiation safety supervision (hereinafter referred to as the NRS ITD).

The materials on the conducted updating of the AIS YaRB application software were submitted to the Fund of Algorithms and Codes of Rostekhnadzor.

The users of the AIS YaRB both in the headquarters and in the ITD NRS were consulted on a regular basis.

The activities have started since 2013 to transfer the AIS YaRB to the new version of DBMS ORACLE 11g and the state-of-the-art platform of Web-technologies to form a unified information space including the framework of the Rostekhnadzor's IIS being generated.

#### *Modernization of the Information and Analytical Center*

The project for updating of the Rostekhnadzor's Information and Analytical Center (IAC) was developed and implemented in 2013 to enable further improvement and development of its functional capabilities.

A closer and more prompt interaction of Rostekhnadzor with public authorities and nuclear facilities was ensured due to deployment of a state-of-the-art hardware and software complex and extension of capabilities of the telecommunication exchange facilities.

A high-speed communication channel with FBE SEC NRS was arranged.

#### *Official web-sites of Rostekhnadzor and Interstate Council on Industrial Safety*

The official website of Rostekhnadzor ([www.gosnadzor.ru](http://www.gosnadzor.ru)) was transferred to the new system of control in 2013, which made it possible to unite and unify the official websites of the Rostekhnadzor territorial bodies by centralization of the hardware and software complexes provided for the systems' operability in the global information and communication network Internet.

In the framework of implementation of Decrees of the President of Russia No. 601 of May 7, 2012 "On the main lines of improvement of the state control system", the Federal Environmental, Industrial and Nuclear Supervision Service of Russia provided for the access at the official website to the open data contained in the information systems of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in 2013.

6 priority sets of open data are presented at the official website of Rostekhnadzor in the section "Open data". 5 sets are presented in the CSV format and 1 set is presented in the XML format.

In 2013, the employees of Rostekhnadzor participated in workshops and meetings devoted to publication and placement of the open data in the Rostekhnadzor's website.

Efforts were continued to maintain operation of the website of the Interstate Council on Industrial Safety ([www.mspbsng.org](http://www.mspbsng.org)) and update its content.



### *Basic state information resources*

In 2013, the employees of Rostekhnadzor participated in workshops and meetings devoted to generation and placement of the basic government information resources (BGIR) descriptors.

2 descriptors were generated at the BGIR register website maintained by the Ministry for Economic Development of Russia (<http://bgir.minsvyaz.ru/>), and namely the Government Register of Hazardous Industrial Facilities and the Register of Rostekhnadzor Licenses for Execution of Specific Activities. Generation of the mentioned descriptors is still in progress.

### *Training in the field of information technologies*

The Federal Environmental, Industrial and Nuclear Supervision Service of Russia held a workshop with participation of the territorial bodies' specialists responsible for organization of the information technologies' introduction arranged by the Rostekhnadzor Legal Department on April 15-16, 2013.

During the workshop the representatives of well-known software and hardware developers and producers presented reports on the news in the field of information and communication technologies. The employees of the headquarters reported on the issues related to introduction of the Rostekhnadzor IIS subsystems, departmental IP-telephony, information and process support of the Rostekhnadzor territorial bodies.

### *IP-telephony*

To enable implementation of the first state of IP-telephony introduction in the Rostekhnadzor's territorial bodies as per Rostekhnadzor Order No. 289 of July 5, 2013 "On arrangement of IP-telephony in the territorial bodies of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia", activities were performed in relation to introduction of IP-telephony in 11 territorial departments in 2013.

The main objective of the IP-telephony introduction project consisted in improvement of the telephone communication quality within the Rostekhnadzor's system, creation of conditions for implementation of the state-of-the-art communication technologies (arrangement of the interconnect number space, performance of video conferences and conference calls, etc.) along with simultaneous reduction of operational expenses and economy of budgetary funds for trunk and in-house communication.

As of end 2013, the number capacity of the Rostekhnadzor IP-telephony system made up 1300 unique numbers. IP-telephony is to be introduced in 17 more territorial bodies of Rostekhnadzor in 2014.

### *Departmental data communication network*

According to the Concept on development of the information technologies supporting the activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia approved by Rostekhnadzor Order No. 902 of September 15, 2011, the activities on development of the departmental data communication network (DDCN) of the Federal Environmental, Industrial and Nuclear Supervision Service were carried out in 2013.

The DDCN comprises the communications central (CC) and 93 virtual

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communication lines (as of end 2013) from the CC to 93 connection objects in all 28 territorial bodies of Rostekhnadzor. The carrying capacity of the channels was selected in accordance with the intended content of the data to be transmitted from the territorial bodies to the headquarters of Rostekhnadzor and back and amounts to 10 000 kbit/s for 80 termination points and 2048 kbit/s for 13 less loaded objects.

The DDCN CC was transferred to the site of the Rostekhnadzor Headquarters in 2013.

The DDCN channels are provided with special hardware and software complexes for information protection ensuring secured transmission of data including confidential ones.

In 2013 access was arranged by means of the DDCN to providing of a number of information and utility services to the territorial bodies - Rostekhnadzor IIS; departmental IP-telephony; information system on regulatory and legal acts, remote access to the data storage.

#### *Computer-based information system "Municipal units' heating period"*

According to Task Order of the RF Government No. DK-P9-6638 of September 17, 2013, a computer-based information system "Municipal units' heating period" of Rostekhnadzor was generated on the basis of the Rostekhnadzor's website [www.ozp.gosnadzor.ru](http://www.ozp.gosnadzor.ru). The system ensures reception of information from all municipal units of the Russian Federation, their subsequent analysis and presentation of summary information to the users in the Rostekhnadzor's territorial bodies as well as other departments concerned.

#### *Registration of the Rostekhnadzor computer-based information systems*

According to Decree of the Government of the Russian Federation No. 723 of September 10, 2009 "On procedure of commissioning of specific state information systems", the information about the federal state information systems developed and (or) operated by Rostekhnadzor (Rostekhnadzor IIS, AIS YaRB, AIS PB, etc.) was updated in 2013. An application was developed for placement of the information about the Rostekhnadzor computer-based information systems in the federal state information system for information systems' accounting AIS Accounting.

The Rostekhnadzor IIS and AIS YaRB were subjected to state registration in the register of computer codes maintained by the Federal Service for Intellectual Property.

Transfer of completed activities' materials related to elaboration (acquisition) of software tools by the Rostekhnadzor's order to the Rostekhnadzor's Fund of Algorithms and Codes was continued.

#### *Information interfaces with JSC RZhd*

According to Rostekhnadzor Order No. 339 of August 6, 2013 "On approval of recommendations on providing the electronic information about hazardous industrial facilities in the test mode for the purposes of registration (re-registration) in the state register of hazardous industrial facilities" (the revision of Rostekhnadzor Order No. 484 of October 21, 2013 "On amendment of Order of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. 339 of August 6, 2013 "On approval of recommendations on providing the electronic information about hazardous industrial facilities in the test mode for the purposes of

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registration (re-registration) in the state register of hazardous industrial facilities", the information about HIFs for the purpose of registration (re-registration) in the state register may be submitted in the electronic form on the machine-readable medium. Thus, activities were arranged on re-registration of procedure 9900 of OPO JSC RZhD. Besides, Agreement No. 00-01-18/991 of September 2, 2013 was awarded on the interfaces between Rostekhnadzor and JSC RZhD.

*Logistical support of Rostekhnadzor's informatization*

According to the approved Schedule and within the allotted funds for 2013, the following procedures of placing orders for information and information-and-process support of Rostekhnadzor activities were performed:

- for delivery of the software for the needs of the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia;

- for establishing of the Information and Analytical Center in the Federal Environmental, Industrial and Nuclear Supervision Service to the following address: Bld. 1, 34 Taganskaya St., Moscow;

- for delivery of computer equipment for the needs of the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia;

- for delivery of the server equipment to ensure functioning of the existing information resources of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia;

- for delivery of equipment for IP-telephony in the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia;

- for rendering of communication services for the needs of the Federal Environmental, Industrial and Nuclear Supervision Service in the framework of IP-telephony introduction;

- for rendering of services to ensure Internet access for the needs of the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia;

- for rendering of services to ensure Internet access for the backup data processing center of the headquarters of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia;

- for execution of activities related to elaboration and maintaining of the software package for the Rostekhnadzor's information website;

- for execution of activities related to elaboration of the Integrated System for Information Support and Computerization of the activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in terms of elaboration of the software modules "Production supervision system - Monitoring", "Analytical reporting subsystem in relation to "Permits. Engineering devices", "Accounting of accident and injury rates" and "Certification of personnel"; implementation of integration requirements of the IIS module "PSS - Monitoring" and PSS of organizations operating HIFs. Based on results of the aforementioned procedures the government contracts were awarded and the delivered equipment put into operation.

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## **VI. FINANCING OF ACTIVITIES**

### ***Administration of the federal budget by the Federal Environmental, Industrial and Nuclear Supervision Service in 2013***

According to Federal Law No. 216-FZ of December 3, 2012 "On the federal budget for 2013 and for the scheduled period within 2014-2015" (as amended and supplemented), the Federal Environmental, Industrial and Nuclear Supervision Service of Russia is the main administrator of the federal budget revenue.

Implementation of the long-term plan for entry of revenues into the federal budget of the Russian Federation was established for Rostekhnadzor for 2013 in the amount of 505,107 thousand rubles.

In 2013, 663,148.9 thousand rubles or 131.3% of the long-term plan were actually received as revenue of the federal budget during exercising of the federal budget system revenues' administrator authorities by the Rostekhnadzor's headquarters and regional bodies (as per updated information). Federal Law No. 216-FZ of December 3, 2012 (as revised) envisaged the budget allotments for Rostekhnadzor for 2013 in the amount of 5,905,389.5 thousand rubles. Adjusted limits of budgetary obligations totaled to 5,902,458.9 thousand rubles.

Utilization of the federal budget in terms of the expenses within 2013 made up 99.58 % limits of budgetary obligations.

The following budget allotments were envisaged for Rostekhnadzor in 2013 in the framework of implementation of the following federal target programmes (FTP):

FTP "Nuclear and Radiation Safety Assurance for 2008 and for the Period up to 2015" (section "National Economy", subsection "Applied scientific research in the field of national economy", research and development work) - 82,840 thousand rubles. Implementation made up 100%. FTP "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015" (section "National Economy", subsection "Applied scientific research in the field of national economy", research and development work) - 3,800 thousand rubles. Implementation made up 94.07%.

FTP "Reduction of risks and mitigation of consequences of natural and man-induced emergencies in the Russian Federation up to 2015" (section "National Economy", subsection "Other issues of National Economy", other procurement of goods, works and services for the state needs) – 6,650.0 thousand rubles. Implementation made up 100%.

FTP "Dwelling" for 2011-2015 (section "Social Policy", subsection "Social support of population", grants to the citizens for acquisition of accommodation) - 59,196.4 thousand rubles. Implementation made up 100%.

92,062.2 thousand rubles were allocated in 2013 from the federal budget for financial support of implementation of government task orders by the federal budgetary institutions under the Rostekhnadzor's jurisdiction. The mentioned sum was utilized in the full scope.

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## **CONCLUSION**

The activities of Rostekhnadzor in 2013 were aimed at assuring nuclear and radiation safety of nuclear facilities, security of hazardous industrial facilities, power industry facilities, employees working at these facilities and population, as well as protection of the environment against man-induced hazards.

### ***Accident and injury rates at the supervised facilities, operational occurrences at nuclear facilities***

98 operational occurrences were registered in 2013 (101 in 2012) ***at nuclear facilities***, including: 38 occurrences at NPP units (51 in 2012); 6 occurrences at nuclear research installations (7 in 2012); 1 occurrence at fuel cycle facilities (no operational occurrences were registered in 2012); 9 occurrences at marine nuclear power installations (10 in 2012); 44 occurrences at radiation hazardous facilities (33 in 2012).

No violations of safe operations limits and conditions were observed during operational occurrences. Neither accidents at nuclear facilities nor events causing radiation consequences were registered. Radioactive releases to the environment were below the permissible limits.

The lowest accident and fatal injury rates have been registered within the period since 1995 ***at hazardous industrial facilities*** in 2013.

Altogether 145 accidents (52 accidents less than in 2012) were registered at hazardous industrial facilities within the reporting period.

Reduction of the accident rates was observed practically in all industries (types of supervision) except for explosive facilities for storage and processing of vegetable raw material (+1 accident) and facilities using pressure equipment (+1 accident).

226 persons died in 2013 during execution of manufacturing activity at the companies supervised by Rostekhnadzor, which are operating hazardous industrial facilities (which is 48 persons less than in 2012 (274)).

At the same time, an increase of fatal injury rate was observed in some industries (types of supervision), particularly at the facilities of coal-mining industry (+27, from 36 up to 63), chemical industry (+2, from 7 up to 9), explosive works (+5, from 1 to 6), as well as at the explosive facilities for storage and processing of vegetable raw material (+2, from 3 to 5).

In 2013 108 accidents occurred ***during operation of electric power plants, customers' electric installations and electrical grids*** (which is 65 accidents less than in 2012 (173)), no accidents were registered during operation of heating plants and heat supply networks as in 2012, 4 accidents occurred ***during operation of hydraulic engineering structures*** (cf. 8 accidents in 2012).

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95 persons died in 2013 during execution of manufacturing activity at the companies supervised by Rostekhnadzor, which are operating power plants, consumers' electrical installations and electric grids (which is 29 persons less than in 2012 (124)). 6 persons died during operation of thermal installations and networks (cf. 3 persons in 2012).

1 fatal casualty was registered during operation of hydraulic engineering structures (cf. no fatal casualties were registered in 2012).

### ***Exercising of state control (supervision) in the established sphere of activities***

#### *In the sphere of the federal state supervision in the field of industrial safety*

In the reporting period Rostekhnadzor conducted 83,306 inspections of legal entities and individuals, 34,872 of them were scheduled inspections (41.8% of the total number of conducted inspections).

Infringements related to 29,766 legal entities and individual entrepreneurs were revealed during the inspections.

Altogether 396,180 violations were found in result of 24,502 inspections; suits on administrative offenses were filed in response to the revealed violations.

The total number of administrative penalties imposed following the inspections amounted to 40,480; the amount of the imposed administrative fines totaled 1,647,790 thousand rubles.

#### *In the sphere of the federal state supervision in the field of use of atomic energy*

Altogether, 6,784 inspection (supervision) actions were taken in respect of the legal entities and individual entrepreneurs; the scheduled inspections made up 1,250 inspections of the total number (18.4% of the total number of inspections performed).

In the course of inspections Rostekhnadzor revealed 2,794 violations within the reporting period; 194 administrative penalties were imposed as a result of inspections.

The amount of the imposed administrative fines totaled 7,009 thousand rubles.

#### *In the sphere of the state energy supervision*

In 2013 Rostekhnadzor conducted 126,456 inspections of legal entities and individuals, 35,275 of them were scheduled inspections (27.9 % of the total number of conducted inspections).

587,692 violations were revealed during inspections; 38,966 administrative penalties were imposed.

The amount of the imposed administrative fines totaled 55,230 thousand rubles.

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*In the sphere of the federal state supervision in the field of safety of  
hydraulic engineering structures*

3,877 inspections were conducted in relation to legal entities and individuals, 1,751 of them were scheduled inspections (45.2 % of the total number of conducted inspections).

12,351 violations were revealed during inspections; 1,467 administrative penalties were imposed as a result of inspections.

The amount of the imposed administrative fines totaled 29,525 thousand rubles.

*In the sphere of the state civil construction supervision*

14,087 inspections were performed by Rostekhnadzor in 2013; the inspections performed on the basis of inspection programs made up 12,402 of this number (88% of the total number of the inspections performed).

51,928 violations were revealed during inspections; suits on administrative offenses were filed and 4,266 administrative penalties were imposed based on results of 3,131 inspections.

The amount of the imposed administrative fines totaled 59,871 thousand rubles.

*Licensing Activity*

In accordance with the legislation on licensing of specific activity types, during the reporting period, Rostekhnadzor granted and renewed altogether 9,350 licenses. Refusals for granting the licenses were issued in 596 cases.

In accordance with the legislation of the Russian Federation on the use of nuclear power, Rostekhnadzor granted 1,547 licenses in 2013. Refusals for granting the licenses were issued in 43 cases.

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The main results of Rostekhnadzor's activities in 2013 were reviewed at the enlarged meeting of the Board of the Federal Environmental, Industrial and Nuclear Supervision Service held on March 20, 2014.

After discussion of the main results of Rostekhnadzor's activities within 2013 and the objectives for 2014, the Board of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia decided to:

1. Recognise the activities of Rostekhnadzor in 2013 as satisfactory.
  2. Define the following **major lines of Rostekhnadzor's activities for 2014**:
    - 2.1. Execution of decrees and orders of the President of the Russian Federation as well as orders and instructions of the Government of the Russian Federation.
    - 2.2. Execution of the main functions of Rostekhnadzor.
    - 2.3. Legitimacy and implementation standards in the Rostekhnadzor's activities.
    - 2.4. Implementation of provisions of Federal Law No. 166-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities" as amended.
    - 2.5. Enhancement of efficiency of supervision in the established spheres of Rostekhnadzor's activities.
    - 2.6. Cooperation with organizations and government bodies of foreign countries.
  3. Enable proper execution of Decrees of the President of the Russian Federation No. 601 of May 7, 2012 "On the main lines of improvement of the state control system", other decrees and task orders of the President of the Russian Federation as well as orders and instructions of the Government of the Russian
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Federation, ensure implementation of the following documents:

the Plan of Activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia for 2014-2018;

annual Plan of Actions on arrangement of public discussions and expert support of the Plan of Rostekhnadzor Activities;

departmental Plan of Rostekhnadzor on implementation of the Concept of Openness of federal executive authorities.

4. Enable proper execution of the main functions of Rostekhnadzor, Headquarters' managers of all levels, Heads of Rostekhnadzor territorial bodies shall ensure the following:

4.1. Fulfillment of measures envisaged by:

the Plan of scheduled inspections of legal entities and individual entrepreneurs of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia for 2014;

the Plan of rule-making activity of the Federal Environmental, Industrial and Nuclear Supervision Service for 2014.

4.2. Enhancement of quality in providing state services, authenticity and completeness of information about the state services, compliance with the dates and procedure specified for rendering of the state services.

4.3. Enhancement of efficiency of inspecting and supervisory activities including those using the subsystem "Inspection and supervisory activities" of the Integrated System for Informatization of Activities of the Federal Environmental, Industrial and Nuclear Supervision Service.

4.4. Efficient and uniform utilization of the federal budget funds, high-quality fulfillment of authorities related to implementation of the RF budgetary system budget income administrator functions.

5. Strengthen legitimacy and implementation standards in the Rostekhnadzor's activities, the managers of all levels of the headquarters, the heads of Rostekhnadzor territorial bodies shall:

5.1. Ensure:

rigorous fulfillment of the requirements of Federal Law No. 273-FZ of December 25, 2008 "On Counteraction against corruption";

monitoring to ensure that the civil servants of the divisions headed by them provide the information on their incomes, property and property-related commitments within 2013, comply with the requirements for observance of restrictions and bans, the requirements for prevention or settlement of a conflict of interests, the requirements for timely notification of the employer's representative about the intent to perform any other paid job taking into consideration that its performance should not result in the possible conflict of interests. Impose legal liability measures up to dismissal from the state civil service on every found case of a conflict of interests if the guilty actions of a civil officer have been ascertained;

observance of the current legislation of the Russian Federation while acting on applications of organizations and citizens containing information about an immediate hazard to life, health of citizens, environment, safety of the state, occurrence of man-induced emergencies or causing such a damage;

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the procedure on investigation of causes of emergencies and accidents occurred at the facilities supervised by Rostekhnadzor; enhance the quality of investigations on the causes of emergencies and accidents;

the dates of submitting of the operative information about occurred emergencies and accidents, orders on extension of investigations, submitting of the emergency and accident causes investigation materials, minutes of the meetings of the Rostekhnadzor territorial bodies held on results of the investigations, as well as the information on fulfillment of measures proposed by the investigation commissions to Rostekhnadzor's Headquarters

5.2. Take measures to enhance efficiency of supervisory activities, paying special attention to the full-scope application of preventive, precautionary and restrictive measures envisaged by the legislation of the Russian Federation aimed at exclusion and preclusion of violations in the established sphere of Rostekhnadzor's activities.

5.3. Exclude the practice of imposing redundant requirements for the organizations supervised by Rostekhnadzor.

5.4. Rostekhnadzor territorial bodies shall give their proposals and justifications on the required amount of transportation means, special uniform, insurance of risks, application of shift methods of supervision and adequate financing to ensure inspecting and supervisory activities of the territorial bodies at remote and hard-to-reach HIFs in the conditions of lack of transportation (passenger) infrastructure and exterritoriality of location of HIFs and operating organizations.

6. Implement the provisions of Federal Law No. 166-FZ of July 21, 1997 "On industrial safety of hazardous industrial facilities" as amended:

6.1. Heads of the headquarters' departments shall:

prepare their proposals on implementation of inspecting and supervisory activities with using state-of-the-art technologies for remote control of the safety state at the facilities being supervised;

develop a set of measures on arrangement of forms of vocational training for newly employed inspectors (as well as the employees with little work experience) in the Rostekhnadzor territorial bodies by means of tutorship, coaching and self-education;

6.2. Legal Department jointly with the Department for Organization, Control and Licensing Activities shall:

arrange elaboration of regulatory and legal acts setting forth the procedure for certification of experts carrying out activities in the field of industrial safety;

6.3. The Heads of the Rostekhnadzor territorial bodies: when planning inspections for 2015 shall:

ensure that the activity of review organizations involved in review of industrial safety is included into the inspection plans;

analyze the results of re-registration of the supervised hazardous industrial facilities including their classification according to the hazard classes and update the information contained in the territorial sections of the state register of hazardous industrial facilities by analyzing correctness of completion of all fields in the information system; and based on the results of the stated activities take measures to eliminate the found non-conformities;

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prepare the inspection plans for 2015 taking into account the results of the analysis on assignment of hazard classes to the supervised hazardous industrial facilities; ensure acceptance of decisions agreed with the branch departments of the Rostekhnadzor's headquarters on inclusion of vertically integrated companies and large operators into the inspection plans for 2015;

6.4. When executing inspecting and supervisory activities:

include the issues related to the company's operating personnel observance of the process regulations, instructions on safe performance of repair, gas-hazardous, hot works as well as other operational documentation into the list of inspecting measures. When violations of the requirements of instructions are revealed during execution of extremely hazardous activities or performance of repair work on the operating equipment or equipment not prepared for such operations, take administrative pressure measures with reference to the officials responsible for performance of the stated activities taking into account the nature and the degree of the public hazard up to their disqualification;

strengthen monitoring to check actual fulfillment of plans, programs, schedules on assuring of industrial safety of enterprises and prospects of development and implementation of the state-of-the-art technologies at industrial facilities, as well as measures on elimination of violations of industrial safety requirements including those related to financing of the mentioned activities and reduction of periods for bringing of hazardous industrial facilities in compliance with the requirements of the federal codes and standards in the field of industrial safety;

inspect correctness of identification of hazardous industrial facilities.

6.5. Fully complete re-registration of hazardous industrial facilities in the territorial sections of the state register before May 1, 2014.

6.6. Update the information contained in the territorial sections of the state register of hazardous industrial facilities by analyzing correctness of completion of all fields in the information system; and based on the results of the stated activities take measures to eliminate the found non-conformities.

6.7. Prepare organizational and administrative documents on assignment of responsibilities of the heads of the territorial bodies for ensuring the regime of continuous state supervision over the Class I facilities as well as ensuring personal assignment of inspectors involved in the stated supervision.

6.8. Analyze the law enforcement practice related to exercising of the continuous state supervision at HIFs within the first half of 2014.

6.9. To optimize the inspectors' workload and reduce the labor expenditures related to maintaining of the documents (supervision files), give proposals on introduction of changes into the Provisions for the continuous state supervision regime at hazardous nuclear facilities and hydraulic engineering structures approved by Decree of the Government of the Russian Federation No. 455 of May 5, 2012 and Rostekhnadzor Order No. 308 of May 23, 2012.

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6.10. Analyze the law enforcement practice related to implementation of HIF document reviews as regards Hazard Class IV facilities and prepare proposals on elaboration of the efficient mechanism of supervision and forms of HIFs' reporting within the first half of 2014.

6.11. Address the issue of revising the Code of Administrative Offenses in terms of taking administrative pressure measures in case of failure to provide the specified reports to the organizations operating HIFs of Hazard Class IV.

7. Enhance efficiency in exercising supervision in the established spheres of Rostekhnadzor's activities, the heads of the headquarters' structural units and the heads of the territorial bodies:

7.1. In the sphere of state regulation of nuclear and radiation safety shall ensure implementation of:

procedures on licensing of activities in the field of atomic energy use, granting of permits for the right of execution of activities to the employees of nuclear facilities, established standards for maximum permissible releases and discharges of radioactive substances into the environment and granting of permits for such releases and discharges, as well as on implementation of the state supervision in the field of atomic energy use based on the new administrative regulations and other regulatory and legal acts;

measures in the framework of the Rostekhnadzor's responsibility under the Program of Actions on participation of the concerned Russian entities and organizations in implementation of the IAEA nuclear safety Action Plan;

Plan of Inspecting Activities and Plan on Development of Regulatory Legal Acts for 2014 to ensure efficient state regulation of nuclear and radiation safety.

7.1.1. Ensure preparation of the 5th national report of the Russian Federation on implementation of requirements of the "Joint Convention..." and its submitting to IAEA within the established dates (jointly with the State Corporation Rosatom).

7.1.2. Promote (within the Rostekhnadzor's jurisdiction) implementation of the national programs, international commitments of the Russian Federation taking into consideration potential hazards of activities and facilities as well as probable threats based on improvement of the organization and enhancement of efficiency of safety regulation in the field of atomic energy use.

7.2. In the sphere of the state energy supervision and safe operation on hydraulic engineering structures:

7.2.1. Ensure implementation of Rostekhnadzor Order No. Pr-647 of December 27, 2013

"On safe operation and serviceability of hydraulic engineering structures supervised by the Federal Environmental, Industrial and Nuclear Supervision Service of Russia within the period of springtime high water and flood of 2014".

7.2.2. Continue implementation of comprehensive measures aimed at assurance of operational reliability and safety of abandoned hydraulic engineering structures, as well as reduction of their number in accordance with Rostekhnadzor Order No. 1183 of December 30, 2010 "On arrangement of activities to ensure operational reliability and safety of abandoned hydraulic engineering structures".

7.2.3. Ensure arrangement of protected areas of power generation facilities.

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7.2.4. Plan inspections of vertically integrated organizations under the general direction of the Department for State Energy Supervision. Don't allow inclusion of inspections of specific branches and production units of companies into the plan without preliminary agreement thereof.

7.2.5. Ensure efficiency of activities carried out by inspectors of Rostekhnadzor territorial bodies during assessment of preparedness of municipal units for the heating period of 2014-2015 taking into consideration Articles 14-16 of Federal Law No. 131-FZ of October 6, 2003 "On general principles for arrangement of local governments in the Russian Federation".

7.3. In the sphere of the state civil construction supervision and supervision over observance of the process regulations' requirements:

7.3.1. Ensure (in the framework of the state civil construction supervision) that information is provided to self-regulating organizations about inspection of its members to determine its possible participation or presence of its representative.

7.3.2. Take measures to exclude the cases of issuing certificates of compliance for capital construction facilities if they are not compliant with the requirements of design documentation and process regulations.

7.3.3. Enhance efficiency of the state inspection (supervision) over observance of requirements of the Technical Regulations of the Customs Union "Safety of lifts" with reference to:

lifts and lift safety devices at the stage of operation;

the process of installation during construction and reconstruction of capital construction facilities, in respect of which Rostekhnadzor exercises inspection (supervision) over observance of obligatory requirements established by the technical regulations in the course of the state civil construction supervision according to the urban planning legislation of the Russian Federation.

7.3.4. Enhance efficiency of the state inspection (supervision) over observance of requirements of the Technical Regulations of the Customs Union "On Safety of Machinery and Equipment" with reference to:

machinery and equipment used at the facilities supervised by Rostekhnadzor and operation and utilization processes related to the requirements for these products;

installation and adjustment including during construction and reconstruction of capital construction facilities, in respect of which Rostekhnadzor exercises inspection (supervision) over observance of obligatory requirements established by the technical regulations in the course of the state civil construction supervision according to the urban planning legislation of the Russian Federation.

7.4. In the sphere of the state mining supervision to ensure reduction of accident and injury rates:

7.4.1. The heads of the Rostekhnadzor territorial bodies shall:

strengthen inspection of compliance with the legislative requirements for mining enterprises being at the stage of liquidation or temporary closedown;

strengthen inspection of subsoil users' implementation of plans on development of mining operations and measures on confinement and isolation of caved areas; when conducting inspections of hazardous industrial facilities of hazard classes I and II pay special attention to the state of the rock mass and the proneness of rock to collapsing;

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based on the analysis on the causes of industrial safety requirements' violations resulted in accidents, incidents, casualties during rock failures, take measures to strengthen inspection over implementation of legislative requirements in this respect;

when conducting inspection and supervisory activities at hazardous industrial facilities, take control of the compliance of the action plans for accident localization and effects removal with the requirements of the Provisions for development of action plans for accident localization and effects removal at hazardous industrial facilities approved by Decree of the Government of the Russian Federation No. 730 of August 26, 2013;

when conducting pre-licensing inspection with regard to the applicants of licenses for activities related to circulation of industrial-purpose explosive materials, strengthen requirements for compliance with Federal Law No. 99-FZ of May 4, 2011 "On licensing of specific types of activities" and relevant provisions on licensing in the field of industrial-purpose explosive materials.

7.4.2. The heads of the headquarters' departments authorized to exercise normative and legal regulation in the field of industrial safety of the mining industry shall continue activities related to improvement of regulatory and legal acts.

7.5. In the sphere of the oil and gas industry in order to reduce accident and injury rates:

according to Task Orders of the Government of the Russian Federation No. P9-547 of January 13, 2014 and No. AD-P9-235 of January 17, 2014, continue the activities in the interdepartmental groups (committees) in order to lower the administrative barriers in the field related to preparation, agreement and reviewing of the design documentation on oil and gas production facilities including well-drilling.

The Heads of the Rostekhnadzor territorial bodies shall:

by May 1, 2014 analyze jointly with inspectors the materials on the accident and injury rates at the oil and gas facilities and bring the information to the notice of the heads of the supervised organizations;

by July 1, 2014 make sure that inspection is performed to check that the industrial safety control systems have been introduced at the facilities of hazard classes I and II as well as that the developed action plans on accident localization and effects removal have been analyzed. At the same time attention should be paid to the efficiency of preventive measures and preparedness of the emergency rescue units to localize and eliminate accidents as soon as possible.

8. Enable international cooperation with foreign organizations and authorities, the heads of the Rostekhnadzor's structural units shall:

8.1. Develop and ensure implementation of the Rostekhnadzor's action plan on results of the IAEA follow-up mission to assess efficiency of the activities in the field of atomic energy use for peaceful purposes performed in November 2013 in Russia.

8.2. Continue active participation of Rostekhnadzor in the activities of the Interstate Council on Industrial Safety and the Commission on Coordination of

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Cooperation of the State Energy Supervision Authorities of CIS Member-States.

8.3. Take part as part of the Russian delegation in the sixth Meeting of the Contracting Parties on review of national reports in accordance with the provisions the Convention on Nuclear Safety.

8.4. Develop international cooperation in the field of supervision over safe operation of hoisting structures.

8.5. Develop partnership with nuclear and radiation safety regulators of the countries that declared their intention to construct the nuclear facilities to Russian designs both on the bilateral and multilateral basis.

Continue activities on rendering assistance to the stated regulators in formation and development of the national systems for nuclear and radiation safety regulation.

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