

**Answers of the Russian Federation to the questions of the Contracting Parties
to the 6th National Report of the Russian Federation on implementation of
CNS over (the period of) 2011-2013.**

Q.No	Country	Article	Ref. in National Report
1	Austria	General	General
Question/ Comment	<p>Are you going to make your CNS reports and the questions and answers to them publicly available? If not, why not?</p> <p>Do you publish IAEA Mission Reports?</p>		
Answer	<p>The Russian Federation's National Reports, beginning with the third one, have been published on Rosatom's website. Rostekhnadzor publishes reports on the CNS also. For instance, the National Report of the Russian Federation for the Second Extraordinary Meeting of the CNS Contracting Parties is available in English on Rostekhnadzor's website at: http://gosnadzor.ru/activity/international/post-Fukushima/national_report/National%20report%20engl.pdf</p> <p>No questions on the CNS reports and answers to them are published by in accordance with practice exist.</p> <p>As far as the IAEA mission reports are concerned, the final version of the report on the results of the 2013 IRRS post-mission has been delivered by the IAEA to the Government of the Russian Federation in February 2014. At present time, the major results of the IRRS post-mission are available at http://www.secnrs.ru/publications/nrszine/4-70-2013/m1.pdf</p>		
Q.No	Country	Article	Ref. in National Report
2	Austria	General	General
Question/ Comment	<p>Are decisions of the regulator published and if so, where?</p> <p>Can interested and affected citizens have full access to important facility related documents (such as Safety Analysis Reports, Regulatory Reviews of SARs, Operating Licenses, EIAs, full Event Reports ...)?</p> <p>Are there any public consultations or round tables provided by the operator or regulator, where current safety issues discussed? If not, is there the intention to create such obligations?</p>		
Answer	<p>Rostekhnadzor's decisions are published on official website (http://www.gosnadzor.ru).</p> <p>Safety analysis reports are not published , as in the regulatory framework of the Russian Federation, there is no requirement to publish it .</p> <p>Interested citizens can gain access to the main conclusions on the analysis of operational nuclear power plants , deficiencies organization operating nuclear power plants , given in the Annual Reports of RTN. Such reports are publicly available on the site RTN (Section 2.2.1) at : http://www.gosnadzor.ru/public/annual_reports/.</p> <p>Materials on operating licenses are not published.</p> <p>Reports of the regulatory body for the SAR reviews are published. In particular, the major results of the expert review with respect to the results of the additional analysis of the Russian NPP protectability against extreme external impacts were published in Yadernaya i radiatsionnaya bezopasnost (No. 1 (63), 2012).</p> <p>Rostekhnadzor carries out public consultations and round tables are conducted. All media applications are considered within the dates specified by Russian law. Besides, work is carried out with journalists, and comments are given for information agencies, printed editions, radio and television. A pool of journalists in the field has been established to cover the activities of Rostekhnadzor's personnel and executive staff. Publications are monitored daily.</p> <p>Public Liaison Office has been organized which handles public applications on any issues dealing with Rostekhnadzor's activities. Public applications are received by mail, via the service's official website, as well as by way personal reception. Public inquiries are</p>		

considered by Rostekhnadzor's experts within the dates specified by Russian law. The schedule has been approved for the personal reception of public by the head of Rostekhnadzor and his deputies.

Rosenergoatom provides public access to the final version of the EIA materials throughout the period from the time of the latter's approval to the time the decision is made on the implementation of the planned activities.

In 2012 Rosenergoatom conducted 13 public discussions of the planned economic and other activities, and 24 public discussions were conducted in 2013, including round tables, public consultations, tours of NPPs, forum dialogs and so on. Specifically, over 60 round tables alone were conducted in 2013. Another form of interaction is organization of field meetings of local-, regional- and federal-level deputies, and members of the Russian Federation Federal Assembly's Council of the Federation at effective NPPs. Such meetings were held at all NPPs in 2013.

Q.No	Country	Article	Ref. in National Report
3	Austria	General	General
Question/ Comment	Do you have a list of gaps between the defined state of the art of science and technology and the current status of safety systems, components and safety analyses of your NPPs? If yes, is this list publicly available and how it is maintained? Do you have plans, schedule and resources to eliminate/improve the gaps?		
Answer	<p>As required by regulatory documents, this list is a list of deviations from the effective Nuclear Safety Standards and Rules as compiled based on results of the NPP unit safety analysis (PSAR, RD nonconformity analyses).</p> <p>The said list is not published.</p> <p>Activities to eliminate or compensate for deviations are part of integrated long-term programs for the upgrading of each NPP (formed for a 5-year term and revised annually) and of the NPP unit upgrading plans for the current year which provide for the required funding for the implementation.</p>		
Q.No	Country	Article	Ref. in National Report
4	Austria	General	General
Question/ Comment	Did you already accomplish analysis of possible threats to your NPPs from extreme natural events taking into account the possible effects of climate change? Are they set as a requirement for the facilities?		
Answer	<p>1. As required by the Russian federal rules entitled «Accounting of External Natural and Technogenic Impacts on Nuclear Facilities» (NP-064-05), the following natural and technogenic impacts are taken into account in the nuclear plant development:</p> <p>Hydrological and meteorological processes and phenomena:</p> <ul style="list-style-type: none"> • flood (flooding); • tsunami; • tides; • tornado; • tropical cyclone (typhoon); • extreme snowfalls and snowpacks; <p>Geological and engineering-geological processes and phenomena:</p> <ul style="list-style-type: none"> • fissure seismic and tectonic displacements, seismic dislocations, seismic and tectonic upswelling and downswelling of crustal blocks; • modern differential crust movements including tectonic creep; • earthquakes (of any genesis); • volcanic eruption; • mudflows; • erosion by water of shores, slopes and streams; • sinks and subsidences; 		

2. After the Fukushima Daiichi accident, safety in conditions of extreme climatic conditions (earthquakes, flooding, dam breaks, breaks of hydro dikes, tornadoes, hurricanes, winds, rainfall, glaze ice, air temperature, lightning strike, etc.) was additionally assessed for all Russian NPPs in operation or under construction in August 2011 with stress tests conducted.

No possible external impacts were discussed with regard for the potential consequences of the climate changes in the NPP deployment area.

Q.No 5	Country Austria	Article General	Ref. in National Report General
Question/ Comment	What would be the final state of sites of decommissioned NPPs? What is your decommissioning strategy and what are the projected costs for decommissioning and for the management of spent fuel and radioactive waste? Are the existing financial mechanisms for financial provisions adequate?		
Answer	<p>The indicators and characteristics of the NPP unit end state following the decommissioning should ensure that it is exempted from the scope of supervision by the Russian Federation government regulators as far as radiation safety is concerned (transfer to the condition of so called «non radiation object»). The particular mode of using the NPP site buildings, structures, systems and equipment after the exemption from the scope of public regulatory supervision is selected at the final stage of the NPP unit decommissioning.</p> <p>Rosenergoatom's unit decommissioning strategy is set forth in «The Concept for Preparing and Decommissioning the Nuclear Plant Units of Rosenergoatom» developed to ensure the compliance with provisions of Rosatom's regulatory and legal documents, and envisions:</p> <ul style="list-style-type: none"> - abandonment of generation I NPP units after the supervised preservation (in connection with the necessity for establishing radioactive waste disposal points, and for effective RW handling activities and equipment); - abandonment of generation II NPP units using the «immediate disassembly» option. <p>The cost of decommissioning and handling of the spent nuclear fuel remaining at units following the final shutdown and the radioactive waste generated during NPP unit decommissioning is funded at the expense of the Decommissioning Reserve formed in the amount of 3.2 % of Rosenergoatom's sales proceeds. The volume of the allocated funds (as calculated) is enough and the existing financial mechanisms are adequate.</p>		
Q.No 6	Country Canada	Article General	Ref. in National Report Various pages
Question/ Comment	<p>Previous peer review recommendations, or challenges included cooperation with neighbouring states that are siting NPPs, peer review findings incorporated into national reports, how to ensure necessary human and financial resources, and introduction of mobile pumps and backup power to enhance emergency response. It would be good to see Russia's responses to these highlighted in the report summary (as suggested in CNS guidelines). Other potential elements to highlight include:</p> <ul style="list-style-type: none"> • important safety issues identified in previous report • significant changes in the national nuclear program • key lessons learned (beyond Fukushima), from corrective actions, emergency drills • findings from the IRRS mission to Russia 		
Answer	<p>The question asked is not detailed, and essentially concerns numerous aspects (issues) addressed in the Sixth National Report of the Russian Federation:</p> <ul style="list-style-type: none"> • Cooperation with neighboring states in the NPP siting is described in Section 16.1 («Emergency Readiness») which says that the adjoining states are kept informed during the NPP construction at new sites as required by the Convention on Environmental Impact Assessment in a Transboundary Context. <p>As part of fulfilling the requirements of this Convention, e.g. the Baltic NPP assessment</p>		

materials were sent to the adjoining states, and consultations were conducted with Germany, Byelorussia, Latvia, Estonia, Denmark, Poland, Finland, Norway and Sweden. Experts of the said countries and interested public took part in the consultations. The comments and recommendations on the results of the consultations were taken into account in the design materials for Baltic NPP.

- The issues of providing the NPP operator with financial and manning resources are set forth in Sections 11.1 and 11.3 of the Report's Article 11 («Financial and Manning Resources»);
- The issues of using mobile pumping equipment and auxiliary power supplies are addressed in Appendix 3 of the Report («Measures Taken in the Light of the Fukushima Daiichi Accident»);
- Issues involved in the further improvement of the NPP safety are addressed in the Section entitled «Readiness for the Management of Severe Accidents» (in Section 6.2 of Article 6 «Existing Nuclear Plants»);
- The IRRS post-mission was conducted in the Russian Federation on 10-19 November 2013. Major IAEA expert conclusions on the post-mission results:
 - Rostekhnadzor is an efficient independent safety regulator reporting directly to the Government of the Russian Federation;
 - Positive structural and manning changes have taken place to ensure regulatory supervision for the construction of new NPP units, still proper attention should be given by the Government of the Russian Federation to providing the regulator with required manning and financial resources;
 - Rostekhnadzor has regulatory documents that contain detailed requirements and instructions with respect to the contents of the emergency response plans for all types of nuclear installations;
 - The actions taken by Rostekhnadzor right after the Fukushima Daiichi accident have been regarded as timely and efficient;
 - A great contribution of the Russian Federation to the IAEA's Nuclear Safety Actions Plan.

The Table given in the appendix to this answer shows the results of the IRRS post-mission.

Support
Documents

Table - The results of the IRRS post-mission in the Russian Federation

	Recommendations	Proposals	Good practices
2009 mission results	25	34	5
Remain open	7	12	
2013 post-mission results	3	1	3

	“Emergency readiness and response” module	2	7	2
Q.No 7	Country Estonia	Article General	Ref. in National Report General	
Question/Comment	Could you comment on the publicly announced information concerning the possible use of small or medium power reactors’ technologies in the Kaliningrad NPP?			
Answer	At present time, the different designs are considered for the deployment of small (20-100MW) units near the Baltic NPP site.			
Q.No 8	Country Estonia	Article General	Ref. in National Report general	
Question/Comment	During the period from 8 to 15 of April 2013, the slightly elevated levels of the radioactive substance Cesium-137 were measured at some monitoring stations close to the Russian border. What are the reasons of elevated levels of the radioactive substance Cesium 137?			
Answer	No deviations from the normal operating conditions of Russian NPPs were recorded in the said period			
Q.No 9	Country Euratom	Article General	Ref. in National Report -	
Question/Comment	In June 2011 there was an incident in Leningrad-2 NPP, which is under construction. The incident occurred when structures of the containment building which is currently under construction collapsed. - Could you please comment why information about this incident is not provided in the Report? - What were the reasons of the incident and what measures were taken to prevent such incidents in the future?			
Answer	Russian report is prepared in compliance with requirements installed. As for the consequences of the incident caused by the collapse of structural reinforcement during the assembly of the outer containment (OC hereinafter) for the reactor building of unit 1 (10UJA) at Leningrad-2 NPP that took place on 17.07.2011, have affected the construction dates, but have not influenced the conditions of the unit’s safe operation as the result of updating. The cause for the given incident was the violation by the organization carrying out the contracted construction and assembly operations (CAO) of the organizational and technological documentation requirements during the OC construction. By decision No. 46-P, dated 05.09.2011, from Rostekhnadzor’s North-European Interregional Territorial Directorate for the Supervision of Radiation and Nuclear Safety, the principal contractor activities at Leningrad-2 NPP for the construction of the nuclear plant units have been suspended as far as the work performance and servicing by the operator is concerned. In the process of consideration by Rostekhnadzor bodies of the principal contractor declaration on the renewal of the license following the elimination of the violations of the license requirements and conditions, a comprehensive unscheduled inspection was conducted. As the result of the inspection, certificate No. 11-09/284, dated 21.10.2011, was prepared which contains the conclusion on the readiness of the declaring party (principal contractor) for carrying out the licensed activities in the area of using atomic energy. To avoid similar incidents in future, a range of measures have been implemented, including:			

- Concern Rosenergoatom carried out the target work organization inspections of all NPPs under construction have been conducted;
- The General Inspectorate of Rosatom State Corporation has developed and put into operation a branch model regulation for the management of nonconformities that defines the procedures for the principal contractor and owner/developer actions in detection of nonconformities to the design or regulatory requirements in the process of building the NPP facilities;
- the principal contractor has established a division (team) with nonconformity management functions (registration, accounting, development of correction measures, analysis of their effectiveness);
- additional requirements with respect to supervising the use of new technologies or operations in the NPP construction have been entered in the principal contractor's NPP Construction Quality Assurance Program;
- requirements for hiring only specialized organizations for the development of specially complicated work projects and for the author's supervision to be ensured by the developers have been entered in the principal contract for the NPP construction;
- additional requirements for the author's supervision organization procedures have been entered in the model principal contract for the NPP construction.

Q.No	Country	Article	Ref. in National Report
10	Euratom		General appendix 3, page 141
Question/ Comment	Measures taken in the light of lessons learned of the Fukushima-Daiichi accident for existing NPPs are listed. Taking into account lessons learned from the Fukushima Daiichi accident, are there any additional design safety features that will be introduced in the reactor designs planned to be constructed within the Russian Federation?		
Answer	<p>Additional safety measures to improve stability against extreme impacts are prepared for NPPs to be constructed in the RF:</p> <ol style="list-style-type: none"> 1. Safe Shutdown Earthquake (SSE) value for new reactor installation is of 8 magnitude according to MSK scale. 2. For the purpose to advance NPP self-sustainability, the inventory of boric acid solution is increased in RI by means of additional accumulator tanks of the III-rd stage. Besides that, additional systems and devices directed at prevention and confining of severe accidents consequences are introduced, in particular: <ul style="list-style-type: none"> 1. inner and outer containment of reactor installation: <ul style="list-style-type: none"> - inner containment is made of the pre-stressed reinforced concrete with the inside steel lining intended for pressure maintenance up to 0,5 MPa and with the reliability coefficient of 1,5; - outer containment is made of reinforce concrete designed for protection against external natural and man-induced impacts. <p>Additional protection from activity emission into environment (passive filtered vent system for inter-containment space) is organized by rarefaction thereof.</p> 2. Alternating intermediate water cooling circuit of RI and containment with air-cooled cooling tower of the closed-type with fans. Cooling tower fans and pumping equipment are supplied from autonomous mobile diesel-generator. 3. Molten core catcher is designed to keep the containment integrity and to exclude release of radioactive products into environment even in case of severe accidents. 4. Passive heat removal system (PHRS) from SG which provides for residual heat removal from core (in the event of AC supply loss (blackout) or loss of the ultimate heat sink) and 		

cooling of under-containment space by means of air-cooled heat-exchangers.

5. Passive hydrogen recombiners that exclude growth of hydrogen concentration in the event of BDBA.

6. Pump units supplied from autonomous air-cooled diesel-generator intended for make-up of reactor and fuel pool in the event of AC sources failure (blackout) with primary circuit leak in case of maximum diameter pipeline rupture.

Q.No	Country	Article	Ref. in National Report
11	Lithuania	General	General
Question/ Comment	Statements of high level officials in the media are that there are concerns on new NPP in Kaliningrad region – the project should be drastically modified or cancelled at all. According to this information it is planned to implement completely new NPP design, which was never operated before and is not included in the EIA report. Could you please clarify the information on plans to change the nuclear reactor design?		
Answer	No decisions have been made by Rosatom on the deployment at the Baltic NPP site of other units, except the AES-2006 unit the construction has been licensed. For decision-making on deploying another unit at the Baltic NPP site, all procedures required by Russian law to license the construction will be performed anew, including public discussions of the environmental impact assessment (EIA) materials.		
Q.No	Country	Article	Ref. in National Report
12	Lithuania	General	General
Question/ Comment	In June 2011 structures of the containment building of Leningrad-2 NPP in process of construction had collapsed. Could you please provide information about the causes of the mentioned incident and what preventive actions were taken to avoid such incidents in the future?		
Answer	<p>The cause for the incident was that requirements of organizational and process documentation were failed to be fulfilled by the organization carrying out the contracted construction and assembly operations (CAO) the OC construction.</p> <p>By decision No. 46-P, dated 05.09.2011, from Rostekhnadzor's North-European Interregional Territorial Directorate for the Supervision of Radiation and Nuclear Safety, the principal contractor activities at Leningrad-2 NPP for the construction of the nuclear plant units have been suspended as far as the work performance and servicing by the operator is concerned.</p> <p>In the process of consideration by Rostekhnadzor bodies of the principal contractor declaration on the renewal of the license following the elimination of the violations of the license requirements and conditions, a comprehensive unscheduled inspection was conducted. As the result of the inspection, certificate No. 11-09/284, dated 21.10.2011, was prepared which contains the conclusion on the readiness of the declaring party (principal contractor) for carrying out the licensed activities in the area of using atomic energy.</p> <p>To avoid similar incidents in future, a range of measures have been implemented, including:</p> <ul style="list-style-type: none"> - Concern Rosenergoatom carried out target work organization inspections of all NPPs under construction; - the General Inspectorate of Rosatom has developed and put into operation a branch model regulation for the management of nonconformities that defines the procedures for the principal contractor and owner/developer actions in detection of nonconformities to the design or regulatory requirements in the process of building the NPP facilities; - the principal contractor has established a division (team) with nonconformity management functions (registration, accounting, development of correction measures, 		

analysis of their effectiveness);

- additional requirements with respect to supervising the use of new technologies or operations in the NPP construction have been entered in the principal contractor's NPP Construction Quality Assurance Program;
- requirements for hiring only specialized organizations for the development of specially complicated work projects and for the author's supervision to be ensured by the developers have been entered in the principal contract for the NPP construction;
- additional requirements for the author's supervision organization procedures have been entered in the model principal contract for the NPP construction.

Q.No	Country	Article	Ref. in National Report
13	Lithuania	General	General

Question/ Comment Could you please clarify on what scope lessons learned from the Fukushima Daiichi accident would be addressed into the design of new NPP in the Kaliningrad Region?

Answer In addition to the improved safety properties that are preventing and confining severe accidents consequences introduced into the design of new NPP in Kaliningrad region and on the basis of safety analysis for extreme external impacts performed in the light of Fukushima-Daiichi NPP accident, the following additional design options are envisaged:

1. Mobile diesel-generator of air-cooled type operated autonomously is provided for every NPP unit.
2. Mobile pumping unit (with back-up) to make-up fuel pools, PHRS tanks, primary circuit from external source is provided.

Besides that, some additional systems and equipment will be introduced aiming to prevent and limit severe accidents consequences, notably:

1. inner and outer containment of reactor installation:
 - inner containment is made of the pre-stressed reinforced concrete with the inside steel lining intended for pressure maintenance up to 0,5 MPa and with the reliability coefficient of 1,5;
 - outer containment is made of reinforce concrete designed for protection against external natural and man-induced impacts.

Additional protection from activity emission into environment (passive filtered vent system for inter-containment space) is organized by rarefaction thereof.

2. Alternating intermediate water cooling circuit of RI and containment with air-cooled cooling tower of the closed-type with fans. Fans of cooling tower and pumping equipment are supplied from autonomous mobile diesel-generator.

3. Molten core catcher is designed to keep the containment integrity and to exclude release of radioactive products into environment even in case of severe accidents.

4. Passive heat removal system (PHRS) from SG which provides for residual heat removal from core (in the event of AC power supply loss (blackout) or loss of the ultimate heat sink) and space cooling under containment by means of air-cooled heat-exchangers.

5. Passive hydrogen recombiners that exclude growth of hydrogen concentration in the event of BDBA.

Q.No	Country	Article	Ref. in National Report
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14	Poland	General Appendix 2 (p. 138-139)	
Question/ Comment	Some capacity and availability values given in the table for the Balakovo NPP units 2-4 exceed 100%, these data must be wrong.		
Answer	For units Balakovo NPP justified increase in power up to 104% of the project value. In addition, the capacity factor influenced by seasonal changes in temperature of the cooling water.		
Q.No 15	Country South Africa	Article General	Ref. in National Report Introduction, 12
Question/ Comment	Have any Peer Reviews being performed of the safety reassessments and their results?		
Answer	<p>Yes, they have. The major results of the expert assessment are set forth in a brief report on results of additional analyses with respect to the Russian NPP resistance to external extreme impacts which was published in Yadernaya i eradiatsionnaya bezopasnost (No.1 (63), 2012).</p> <p>As the result of additional safety assessments for the Russian nuclear plants in operation (stress tests), the following major conclusions have been made by Rostechndzor:</p> <ol style="list-style-type: none">1. Effective Russian nuclear and radiation safety requirements are observed at the NPPs in operation in the Russian Federation;2. Rostechndzor regards as justified and sufficient the short-, medium- and long-term measures developed by Rosenergoatom based on additional analyses for the Russian NPP resistance to extreme external impacts for improving the NPP safety to be implemented subject to Rostechndzor's supervision;3. Rostechndzor finds it reasonable to perform an additional analysis of resistance to extreme external natural and technogenic impacts for the Russian NPPs in operation or under construction;4. Rostechndzor finds it reasonable to perform an additional analysis of resistance to extreme external natural and technogenic impacts from research reactor facilities and the largest nuclear plants of the fuel cycle enterprises;5. Rostechndzor has recognized it reasonable to update the Russian regulatory framework in the field of atomic energy uses by addition of requirements to emergency documentation (beyond-design basis management guides, severe accident management guides); requirements for taking into account external natural and technogenic impacts in the NPP designs; and requirements to the nuclear plant siting, as to the rules for design of seismic-resistant NPPs, the requirements to the nuclear plant safety analysis reports; and implementation of the leak-before-break safety concept at NPP units;6. Rostechndzor finds it reasonable to develop, jointly with Rosatom, the Program of Measures for the Participation of the Russian Federation in the Implementation of the IAEA Nuclear Safety Actions Plan, with the involvement of the Russian Federation Ministry for Foreign Affairs, the Russian Federation Ministry for Civil Defense, Emergency Situations and Elimination of the Consequences of Natural Disasters, and the Federal Medical and Biological Agency.		
Q.No 16	Country South Africa	Article General	Ref. in National Report Introduction, 12
Question/ Comment	Did the safety reassessment include review of the robustness of essential I&C systems and essential equipment ensuring the adequacy and reliability of key I&C for monitoring key parameters in all conditions? If so, please list the measure that are being taken or have been considered to improve the robustness of essential and emergency I&C systems.		
Answer	The rationale for the serviceability of I&C in conditions of normal operation and in emergencies, including the maximum design-basis accident and the ultimate design-basis earthquake, is provided in the NPP design. The stability of I&C is periodically assessed for		

the external impacts taken into account when amendments are issued or the reactor facility and NPP safety analysis reports are reissued.

In 2014, to analyze the robustness and serviceability of I&C required for emergency monitoring, two beyond-design-basis accidents will be additionally analyzed: the unit blackout and loss of the ultimate heat sink. The external factors that affect damaged I&C will be listed for the given scenarios with the values thereof determined. Based on this data, updated specifications will be developed with respect to damaged I&C (US), with I&C to be further technically upgraded so that to be compliant with the updated specifications.

Q.No	Country	Article	Ref. in National Report
17	Spain	General	12,13
Question/ Comment	According to the Introduction and related websites, the regulatory and supervision function of Rostekhnadzor affects the NPP Operator, Rosenergoatom. But there are other nuclear facilities, operated by the sole stockholder of Rosenergoatom, Atomenergoprom (like mining, enrichment, fuel fabrication), and by the main Corporation that owns the latter, Rosatom (like low and medium level waste storage and spent fuel and high level waste management). Are all the regulatory and supervision processes by Rostekhnadzor, described in the report for Rosenergoatom activities, applicable to Atomenergoprom and Rosatom facilities?		
Answer	The National Report of the Russian Federation describes the fulfilment of the obligations arising from the Convention on Nuclear Safety which covers (as specified in Article 2) land-based civilian nuclear plants. All nuclear plants in the Russian Federation are operated by Rosenergoatom and are not operated by Atomenergoprom and Rosatom. Accordingly, no regulation of nuclear and radiation safety with respect to the installations in control of said organizations is addressed in the CNS.		
Q.No	Country	Article	Ref. in National Report
18	Switzerland	General	Appendix 3, p. 141
Question/ Comment	According to appendix 3 of the national report, activities have been organized for introducing «Seismic protection systems» at NPPs with pressure tube reactors. Please give an outline how the seismic protection of these NPPs will be realized by this system.		
Answer	The seismic protection system at NPPs with pressure-tube reactors are developed and introduced with the use of backup hardware inputs in the CAPCS of sets 1 and 2. The emergency protection mode in each CAPCS set (EP rod insertion) is generated based on a «out of 3» algorithm in response to the EP signals received from the seismic protection sensors with no extra handling of input signals. Warning alarms are generated using a similar algorithm. The designer defines the positions of seismic detectors inside the unit rooms. Seismic protection was put into pilot operation at unit 2 of the Smolensk NPP. In 2014-2015 seismic protection will be implemented at the Smolensk NPP's units 1 and 3, at the Kursk NPP's units 1-4, and at the Leningrad NPP's units 1-4. At the stage of pilot operation, seismic protection triggers a warning signal for the operator when the ultimate design-basis earthquake is exceeded. Based on the pilot operation results, a decision will be made for each unit as to the inclusion of seismic protection in the emergency protections leading to the reactor facility shutdown.		
Q.No	Country	Article	Ref. in National Report
19	Turkey	General	24-38
Question/ Comment	Appendix 3 of the report lists measures taken in the light of lessons of the Fukushima-Daiichi accident. Are you planning to legalize the use of those measures by updating the current regulations? If so which regulations will be updated accordingly?		
Answer	Yes, we are. At present time, a number of federal nuclear standards and regulations are		

being updated, including «General Provisions for Ensuring Safety of Nuclear Plants», «Deployment of Nuclear Plants. Major Safety Assurance Criteria and Requirements», «Design Standards for Seismic-Resistant Nuclear Plants», and «Deployment of Nuclear Plants. Major Safety Assurance Criteria and Requirements». The lessons learned from the Fukushima Daiichi accident are taken into account during the updating. Some documents (primarily safety guides) are being developed anew.

Q.No	Country	Article	Ref. in National Report
20	Ukraine	General	para 6.3, page 19
Question/ Comment	<p>It is stated in para. 6.3 that «Upgrades at NPPs can be routine upgrades, which are carried out annually under target technical modernization programs of NPPs at each unit irrespectively of its service life, and special-purpose upgrades, which are carried out under target life extension programs of units».</p> <p>Could you provide examples of special-purpose upgrades that are currently underway?</p> <p>Could you provide examples of special-purpose upgrades that are underway at NPPs for life extension purposes?</p>		
Answer	<p>1. Work is under way at all effective units as part of the current upgrading activities to maintain reliable, safe and cost-effective operation. All currently undertaken upgrading measures are formed into target technical programs implemented as part of the NPP Upgrading Plans (UP hereinafter).</p> <p>Examples of the current upgrading (designated as special) performed as part of the UP are the following activities:</p> <ul style="list-style-type: none"> - upgrading of electrical engineering equipment; - upgrading of the turbine automatic regulation system; - upgrading of the turbine blading section; - upgrading of the MCP-195 main connectors. <p>2. For the unit life extension, a separate project is developed, which includes activities for the unit upgrading aimed at achieving license for further operation.</p> <p>Examples of specific upgrading performed as part of the life extension investment project implementation are as follows:</p> <ul style="list-style-type: none"> - at all units with RBMK reactor facilities: - new reactor control and protection and safety controlling systems have been introduced to ensure the safety level that meets the existing nuclear safety standards and regulations; - overaged components have been replaced (including replacement of process channels, generators and heat exchangers); - at units with VVER reactor facilities, for instance: - the following activities were performed in 2013 at unit 1 of the Kalinin NPP: electrical engineering equipment (330kW air circuit breakers, KRU-0,4 kV and KRU-6 kV switchgears) was replaced, overaged monitoring and control system equipment (neutron flux monitoring instrumentation, CPS electrical equipment, MCR and ECR panels, TG vibration monitoring system, MCPs, automatic regulation system) was replaced, heat-mechanical equipment was replaced (partially: pumps, valves, pipelines, ejectors), the turbine condenser piping was replaced, the spent nuclear fuel storage system is retrofitted, a full-scale simulator is introduced, fire safety is improved, components and parts are replaced in the emergency cooling system, special gas and water purification systems are upgraded, components are replaced in the feedwater system, ventilation and air-conditioning system components are replaced, the turbine plant automated control system is replaced, the nitrogen and oxygen station equipment is replaced). 		
Q.No	Country	Article	Ref. in National Report
21	United States of America	General	Appendix 3, Page 141
Question/	The report states that emergency drill plans have been complemented with a scenario of a		

Comment beyond design basis accident that affects the whole of the plant with simultaneous engagement of all available units of mobile emergency response equipment.

(1) Have these emergency drill plans been implemented?

(2) If yes, can you share any lessons learned?

Answer In 2011, under the plan of measures to mitigate the consequences of beyond-design-basis accidents at NPPs, unscheduled emergency drills (UED) were conducted for the personnel based on scenarios of beyond-design-basis accidents with regard for the lessons learned from the Fukushima Daiichi accident.

At present time, most emphasis is placed on emergency drills for the management of severe beyond-design-basis accidents that affect the whole of the NPP (similarly to the Fukushima Daiichi accident), including acquisition of practical skills in using mobile emergency response equipment for coping with a conventional beyond-design-basis accident at an NPP. In 2013 the use of mobile emergency equipment for emergency response in the event of severe accidents was trained for as part of UEDs at the Balakovo NPP (23.04.2013), the Rostov NPP (18.06.2013), the Kalinin NPP (06.09.2013) and the Novovoronezh NPP (13.11.2013).

A separate component trained for as part of UEDs is organization of interactions between the Crisis Center and the NPP in conditions of the power supplies lost.

The outcome of the integrated emergency response exercises and training it was decided to establish a special part of the departmental units NPP separate group, whose main objective is the prompt start of the operation of mobile emergency equipment.

Q.No 22	Country Austria	Article Article 6	Ref. in National Report 6.1, p14
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Question/ Relevant also under Art. 18, Para. 2 of the convention (National Report reference p114)
Comment Could you please share with us how the Russian Federation is going to resolve the task with availability of human resources, having in mind the various upcoming challenges like, the aging of first generation nuclear personnel, the ambitious domestic nuclear program of the Russian Federation, the cooperation with many embarking or other nuclear countries and plans to construct and operate (under BOO and other arrangements) nuclear power reactors outside Russia?

Answer At present time, Rosenergoatom is fully staffed with qualified personnel required for the operation, maintenance and repair of the NPP major and auxiliary equipment, and for the performance of managing, administrative and other functions.
Major sources of the NPP staffing:
– employment of personnel from other power enterprises (nuclear and heat power plants, grids and substations);
– invitation of graduates from higher and vocational secondary education establishments.
The average age of the NPP personnel is 41.41 years, and the average age of the executive staff is 45.85 years. Over 55% of those employed at NPPs have the length of service within the nuclear industry of more than 10 years. The NPP executives and experts meet the qualification requirements for the positions occupied.
Nuclear energy development plans take into account the need for qualified personnel, including for foreign nuclear power plants.

Q.No 23	Country Bulgaria	Article Article 6	Ref. in National Report p. 15
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Question/ The report explains that combinations of site specific external events have been

Comment additionally analysed and that the selection of these combinations was done based on expert justification.
Bulgaria would appreciate if Russia could clarify whether probabilistic methods have also been used to define the combinations of external events?

Answer A matrix for combining natural and technogenic events has been developed for taking into account potential events to the fullest possible extent. When the matrix was developed, the list of natural and technogenic events was used, as considered in the analysis of natural and technogenic effects on the NPP safety (see Russian federal regulations entitled «Accounting of External Natural and Technogenic Impacts on Nuclear Facilities», NP-064-05).
Proceeding from the fact that the undertaken analyses of natural and technogenic impacts on the NPP safety postulate a combination of technogenic initial events and the most unfavorable natural phenomena, and the assumptions that a combination of two external technogenic events is highly unlikely, combinations of external events were listed for the analysis.
No probabilistic techniques were used to define combinations of external events.
Systematic analysis of the impact of combinations of external influences on NPP safety is scheduled to perform as part of probabilistic safety analysis for external influences development (completion) that are scheduled by the operating organization.

Q.No	Country	Article	Ref. in National Report
24	Bulgaria	Article 6	p. 17

Question/ Comment Could Russia provide some more information on the measures to compensate the loss of ultimate heat sink in case of severe accident?

Answer The measures to compensate for the loss of the ultimate heat sink at NPPs with VVER reactors are as follows:

- using a portable high-power air-cooled emergency diesel generator to support operations of the service water pump for essential consumers;
- supply of a boric acid solution into the reactor by one of the design pumps with its makeup from a portable high-power air-cooled emergency DG;
- supply of a boric acid solution into the reactor from a portable high-pressure diesel pump unit;
- makeup of steam generators from a portable high-pressure diesel pump unit;
- makeup of steam generators from motor pumps and/or fire engines when the pressure in the steam generators goes down to below 10-12 kgf/cm²;
- supply of a boric acid solution into the spent nuclear fuel cooling pool using a portable motor pump;
- makeup of pools in the detached spent nuclear fuel storage facility from a medium-pressure diesel pump and motor pumps;
- use of a high-capacity motor pump for supply of cooling service water to the design diesel generator of the NPP emergency power supply system.

The general approach taken to compensate for the loss of the ultimate heat sink in the event of a severe accident at NPPs with pressure-tube and fast-neutron reactors was the purchase of portable emergency response equipment (diesel generators, diesel pumps and a motor pump) intended to power the unit's standard pumping equipment, as well as to organize water supply from backup sources into the reactor circuit (excluding NPPs with the BN-600 reactor) and for the spent fuel cooling in the near-reactor cooling pools, as well as in the cooling pools of detached spent fuel storage facilities.
At NPPs with RBMK-1000 reactors it is possible to organize the reactor cooling by creating air flows through the reactor facility steam separator and steam-water line rooms.
An additional emergency cooldown system with an air-cooled heat exchanger was put into

operation at NPPs with the BN-600 reactor to remove residual heat from the reactor to the atmosphere in all situations caused by failures of the main emergency cooldown system (through the tertiary circuit).

Q.No 25	Country Bulgaria	Article Article 6	Ref. in National Report p. 22
Question/ Comment	The report explains that development of a program is foreseen (for each NNP), to confirm that during the operation of the plant at increased power, the parameters will comply with the design values. Could Russia provide some additional information on the results from the analyses of power uprate safety margins (i.e. departure from nucleate boiling ratio) and how the sufficiency of new margins is justified?		
Answer	The general architect of the reactor facility analyzes each unit's safe operation at an increased power level with determination of DNBR among other things. During pilot operation of the unit at increased power, process parameters are monitored as required by the pilot operation program to make sure that they comply with the respective design values.		
Q.No 26	Country Canada	Article Article 6	Ref. in National Report Page 21, Table 6.1 All lines
Question/ Comment	Please provide the rationale for different periods of life extension included in Table 6.1.		
Answer	The life extension period is supported by respective Rosatom decisions based on the upgrades and safety analyses completed. The life extension periods are defined by Rostechndzor individually for each unit based on the expert review of the operator's documentation which provides the rationale for the suggested unit life extension beyond the initially specified life. If factors are revealed in the course of the review which fail to demonstrate the operating safety of any of the unit's systems or components during the additional life requested for, this may be reduced to a period during which safe operation of the plant is regarded as feasible according to the review results.		
Q.No 27	Country Canada	Article Article 6	Ref. in National Report Page 15, 6.2 various
Question/ Comment	This subarticle addresses the robustness of Russian plants in regard to extreme external impacts, and the measures to ensure plant safety following the analysis of the events at Fukushima-Daiichi NPP. In addition to the IAEA activities, is there a comprehensive national action plan to address the lessons learned, covering the legislative and regulatory framework, regulatory instruments and standards, technical, licensing and compliance plans to implement the key lessons learned?		
Answer	Such plans do exist at Rosatom, Rosenergoatom and Rostechndzor; these cover all aspects of activities for taking into account the lessons learned. Specifically, the technical part of these plans envisions implementation of short-term, medium-term and long-term measures as presented in detail in the Russian Federation report for the Second Extraordinary Meeting of the CNS Contracting Parties in August 2012 in Vienna. Rostechndzor plans to improve the regulatory framework, the licensing system and so on. These plans are interlinked and subject to supervision during implementation.		
Q.No 28	Country Canada	Article Article 6	Ref. in National Report Page 15, Section 6.2 and 7

Question/ Comment How, specifically, are the key lessons learned from Fukushima-addressed in legislative, regulatory instruments or standards?

Answer The currently revised federal nuclear standards and regulations are expected to contain a number of new requirements arising from the analysis of the Fukushima-Daiichi accident:

- the facilities used to manage beyond-design-basis accidents have requirements placed thereon as safety-related components;
- the requirement for deterministic and probabilistic analyses to be performed for all types of initial events (both internal and external);
- the requirement for the facilities used to manage beyond-design-basis accidents at NPPs to include facilities to accident management involving the NPP blackout and loss of heat removal to the ultimate heat sink, as well as facilities for severe accident management;
- requirement for facilities to be provided in the design for the reactor facility and nuclear plant condition monitoring in emergency conditions, severe accidents included, as well as post-accident monitoring facilities;
- requirement for the facilities to manage beyond-design-basis accidents to be provided in such quantity as will be sufficient in the event of an accident occurring simultaneously at all units of the multi-unit nuclear plant;
- requirement for the external impacts caused by accidents at adjoining units (in the event of a multi-unit NPP) to be taken into account;
- requirement for the NPP safety to be ensured in the event of a seismic impact in excess of the ultimate design-basis earthquake (this uses the probability of a major emergency release to take place as the criterion);
- some others.

Q.No 29	Country Canada	Article Article 6	Ref. in National Report Page 20, Line 5 from the bottom
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Question/ Comment Please clarify what does «testing of the unit systems and equipment» mean for the second stage of life extension activities? Does it mean testing of upgraded components or testing the system, or testing the entire unit (similar to a re-commissioning of all systems)?

Answer Stage 2 of the preparations for the life extension activities suggests upgrading of the unit and replacement of equipment and components. The commissioning stage includes functional tests of individual equipment packages and components, individual tests of equipment (systems) and integrated tests of systems.

The purpose of individual equipment (system) tests is to check if requirements contained in design and factory documentation, specifications and the operator's standards are met. The purpose of an integrated test as part of the unit is to check, adjust and support coupled operation of the upgraded systems with other of the unit's systems (components), and check them for the preparedness to perform their respective functions in all design process modes.

Occasionally, for instance, in the event of an integrated unit upgrading with replacement, en masse, of power and/or test cables, it is mandatory to test the unit as the whole. Individual tests and integrated tests should be conducted based on programs (instructions). The programs of tests required by the process regulations and operating instructions are approved by the NPP's chief engineer.

Tests on safety-related components and systems, other than required by process regulations, shall be conducted based on programs approved by the operator and agreed with the design developers. Such tests are authorized by Rostekhnadzor subject to duly made out amendments to the license validity conditions and are conducted as permitted by the operator.

Q.No 30	Country China	Article Article	Ref. in National Report section 6.4
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Question/ Comment	What is the most technical challenge in the accreditation of the NPP life extension in Russia? How to solve the problems?		
Answer	<p>Technically, the greatest difficulty consists in the conservative analytical and experimental prediction of the reactor vessel metal condition based on prediction models.</p> <p>Taking into account the conservatism of calculation procedures, the intermediate life extension for vessels turns out to be normally underestimated, after which the extended life requires an extra rationale for the service life characteristics of irreplaceable reactor facility components (generation I VVER-440 vessels).</p> <p>When the load-bearing capability of the reactor vessel comes to an end in terms of the brittle strength criterion prior to the expected life extension, a decision is made on annealing the reactor vessel to have its service life characteristics recovered. Annealing of the reactor vessel is an efficient technique proved by the experience of operation at VVER-440 units and planned for implementation at VVER-1000 units.</p>		
Q.No 31	Country China	Article Article 6	Ref. in National Report section 6
Question/ Comment	<p>After the Fukushima Dai-ichi accident, NPPs have equipped portable power and portable pumps – and how to decide the quantity of the portable equipment regarding the different number of units of the NPPs? How do the progress of improvement after the Fukushima Dai-ichi accident at present? Are these improvement measures enforced by the National regulatory body?</p>		
Answer	<p>The types and characteristics of diesel generators and portable pump units are determined by analyzing scenarios of beyond-design-basis accidents for reactors of different types. A beyond-design-basis accident that affects simultaneously all units at the NPP site was postulated to determine the quantity of required portable equipment.</p> <p>At present time the status of the post-Fukushima improvements is as follows:</p> <ul style="list-style-type: none"> - additional NPP safety assessments have been completed, including the analysis of accidents, for extreme external impacts based on results of stress tests and expert review of materials by Rostekhnadzor; - supply of portable emergency response equipment (diesel generators, diesel pumps, motor pumps) to the NPP has been completed; - additional design solutions have been developed for the connection of portable equipment; - work is finalized for the additional studies and analyses of the NPP seismic zoning materials, and for synthesizing accelerograms and response spectra (to be completed in 2014); - units, which do not have such, are being fitted with seismic protection systems (to be completed in 2015); - work is performed to fit units with «emergency» instrumentation designed to operate in conditions of beyond-design-basis accidents; - systems have been put into operation at the Kursk NPP and at the Leningrad NPP for dismantling and storage of spent nuclear fuel. At the Smolensk NPP, such system is expected to be commissioned in 2015; - activities are carried out to improve the emergency preparedness of the NPP and the Operator; - the number of regular emergency drills for the personnel actions in conditions of beyond-design-basis accidents has been increased to two per year; - maps of personnel actions at severe beyond-design-basis accidents and map application algorithms have been put into operation at NPPs; - updating of the plant emergency response documentation and beyond-design-basis 		

accident management guides is planned for 2015-2016.

The decision on required technical and organizational measures to improve the safety of Russian NPPs during beyond-design-basis and severe accidents based on the lessons learned from the Fukushima-Daiichi accident was adopted jointly with Rosatom and Rostekhnadzor. The performance of these measures is subjected to supervision.

Q.No 32	Country Euratom	Article Article 6	Ref. in National Report page 19
Question/ Comment	<p>However, it should be pointed out that designs of the plants under construction feature a high level of safety and increased safety margin.</p> <p>Is an adaptation of the safety requirements for new power plants envisaged for the existing NPPs in operation when extending the life time or performing Periodic Safety Review?</p>		
Answer	<p>There are no plans to adjust safety requirements for power units prepared for lifetime extension.</p> <p>Requirements of safety norms and rules cover all NPP units under operation including PSAR development and in the course of lifetime extension.</p>		
Q.No 33	Country Euratom	Article Article 6	Ref. in National Report page 23
Question/ Comment	<p>The process of graphite stack form change is the main issue with the existing RBMK-1000 units of the first generations. In November 2013 the LTPR program for all RBMK reactors will be available.</p> <p>According to table 6.1 the life time of Leningrad unit 1 was extended in 2010 to the end of 2016 and in table 6.2 the licence of Kursk 1 expires in 2013. Is the problem discussed in section 6.6 finally solved for both units?</p>		
Answer	<p>According to the license granted by the regulator to the operator (Rosenergoatom), the RBMK-1000 reactor facility at Kursk 1 and Leningrad 1 is permitted to be operated until 2016.</p> <p>When the limits of the regulatory values are achieved at units, a work package is performed to restore the reactor facility's service life characteristics that ensure their safe operation in the extended life period.</p> <p>In 2013 at Leningrad 1, following the repair and recovery operations, controlled parameters of the reactor facility's structural elements were restored, and further operation was authorized by the regulator, with the unit being currently operated at the rated power level.</p> <p>The experience gained and the technology used for the repair and recovery operations at the reactor facility have made it possible to solve the problem of the units with RBMK-1000 reactors and support their safe operation in accordance with the license validity conditions. Programs to restore the reactor facility's service life characteristics have been developed for all NPPs with RBMK reactors. The work to restore the reactor facility service life characteristics at Kursk 1 is scheduled for and will be performed in 2014.</p>		
Q.No 34	Country Euratom	Article Article 6	Ref. in National Report 6.4, page 20
Question/ Comment	<p>One effective means of demonstrating progress in safety upgrading of Russian NPPs would be to provide an inventory of the safety issues identified in the IAEA issue books, and how they are being or have been addressed by the safety improvement programme for each NPP.</p> <p>- In what way is the progress in addressing the IAEA safety issues taken into account in the decision of the regulatory body to grant licenses for lifetime extension? Does the</p>		

regulatory body, for instance, demand that all safety issues of Category III and IV be eliminated before granting a license for life extension, as in Ukraine?

- Has it been the case for those plants that have already received the license for extended operation?

Answer Apart from the IAEA documents, the list of safety problems is defined in Russia as specified by the safety guide «Analysis of the Nuclear Plant Unit Nonconformities to Requirements of Effective Regulatory Documents» (RB-028-04). The classification given therein is similar to the IAEA classification with slight differences. When decisions are made on the unit life extension, Rostekhnadzor takes into account primarily the conformity to the given document.

There are no category IV safety deficiencies on operating units Russia.

The main part of the safety deficiencies categories III has been corrected in the period 1997-2008 gg. The remaining security problems categories III, identified by Units 1 and 2 Kalinin and Unit 3 Smolensk NPP, in accordance with the guidelines of the IAEA, will be addressed in a timely manner (2014-2016.).

Q.No	Country	Article	Ref. in National Report
35	Finland	Article 6	21, table 6.1

Question/Comment Normally life time extension with Russian LNPP's has been 15 years. Why Leningrad -1 has 13 years.

Information of Leningrad -3 is missing on the same table.

Answer For Leningrad 1, the extended lifetime was limited by the justified value of the graphite stack life which was related to the onset of the GS mass cracking expected by 2016 (after 13 years of the operation in excess of the design life). At present time, it has been demonstrated and proved by the example of Leningrad 1 in operation that the graphite stack retains its structural and strength properties when there is a mass graphite cracking, so its life is not limited by the onset of the mass graphite stack cracking.
As far as Leningrad 3 is concerned, the license for the extended operation was granted in late 2009, and has not been formally entered in Table 6.1 (the period of 2010-2012). The license to operate Leningrad 3 was granted on 31.01.2025.

Q.No	Country	Article	Ref. in National Report
36	France	Article 6	§ Art 6 - p. 14 to 23

Question/Comment Russian Federation gives the measures planned or implemented to ensure Russian NPPs' safety following the results of the analysis of the Fukushima Daiichi NPP events. Could Russian Federation gives more details on the schedule for the implementation of the planned modifications?

Answer In accordance with «Updated Measures to Mitigate the Consequences of Beyond-Design-Basis Accidents at NPPs», the following deadlines have been set for implementing the planned measures at NPPs:

- performance of stress tests - 2011 (completed);
- supply of portable emergency response equipment (portable diesel generators, portable pump units, motor pumps) to the NPP - 2012 (completed);
- development of design and budget documentation for the major scope of measures - 2013 (completed);
- development of the severe accident management guide (RUTA) for NPPs with VVER reactors (for units that do not have RUTA guides) - 2014;
- implementation of technical measures at NPPs - 2014-2015;
- updating of the emergency response instructions, and of the beyond-design-basis accident management guides and the severe accident management guides.

In accordance with the program for improving the stability of Russian NPPs to external

natural and technogenic impacts, the status at NPPs with pressure-tube and fast-neutron reactors is characterized by the following:

- additional NPP safety assessments have been completed, including analyses of accidents for extreme external impacts based on results of stress tests and the expert review of materials by Rostekhnadzor;
- supply of portable emergency response equipment (diesel generators, diesel pumps, motor pumps) to NPPs has been completed;
- additional design solutions have been developed for the connection of portable equipment;
- accessories are being purchased for implementing additional design solutions directly at units (completion year – 2015-2016);
- ISARs and DSARs are being updated (to be completed in 2015);
- updating of PSARs with regard for extreme external impacts is being prepared for (to be completed in 2016-2018);
- justified final lists of beyond-design-basis accidents are developed (to be completed in 2014);
- work is finalized for the additional studies and analyses of the NPP seismic zoning materials, and for synthesizing accelerograms and response spectra (to be completed in 2014);
- units, which do not have such, are being fitted with seismic protection systems (to be completed in 2015);
- work is performed to fit units with «emergency» instrumentation designed to operate in conditions of beyond-design-basis accidents;
- procedures are being developed for calculation of the ice formation in emergency cooling pipelines (to be completed in 2014);
- systems have been put into operation at the Kursk NPP and at the Leningrad NPP for dismantling and storage of spent nuclear fuel. At the Smolensk NPP, such system is expected to be commissioned in 2015;
- activities are carried out to improve the emergency preparedness of the NPP and the Operator;
- the number of regular emergency drills for the personnel actions in conditions of beyond-design-basis accidents has been increased to two per year;
- maps of personnel actions at severe beyond-design-basis accidents and map application algorithms have been put into operation at NPPs;
- updating of the plant emergency response documentation and beyond-design-basis accident management guides is planned for 2015-2016.

Q.No	Country	Article	Ref. in National Report
37	France	Article 6	§ Art 6-2 - p. 17 and 18
Question/ Comment	Russian Federation mentions a specific set of technical aspects and actions taking into account the Fukushima Daiichi NPP accident, including organizational measures. Could Russian Federation give more information on how safety culture and human and organizational factor issues are addressed, including operator training, cumulative impact on human performance of a set of post-Fukushima modifications, support of contractors in implementing actions, sufficiency of well-trained people still available on a degraded site, the correct functioning of national organizations and emergency preparedness (degree of realism of exercises and drills, etc.) and response...?		
Answer	Stress tests at all 10 Russian NPPs were performed by the research, design and engineering organizations and nuclear plants licensed to carry out the given type of activities and having qualified personnel. Given the NPP safety shortages, the development of «Measures to Mitigate the		

Consequences of Beyond-Design-Basis Accidents at NPPs», which provide for the package of technical and organizational measures, was organized to avoid and manage beyond-design-basis and severe accidents.

The implementation of «Measures to Mitigate the Consequences of Beyond-Design-Basis Accidents at NPPs» is subjected to supervision by Rosatom, the Government of the Russian Federation and Rostekhnadzor.

Portable emergency response equipment was supplied by manufacturers licensed by Rostekhnadzor for this activity.

Design and budget documentation is developed by design, engineering and research organizations licensed by Rostekhnadzor for this activity.

The operator and the NPP are responsible for providing, in due manner and on a competition basis, required equipment and materials to implement additional design solutions.

Measures are implemented in a regular routine manner by construction, assembly and commissioning organizations licensed by Rostekhnadzor for respective activities, and by the NPP personnel.

Operating and emergency response documentation will be developed and updated in due manner with the involvement of commissioning, research, design and engineering organizations.

The NPP operating and technical personnel will be trained based on specified personnel training procedures.

To maintain the equipment purchased and accepted for operation at Russian NPPs as specified in «Measures to Mitigate the Consequences of Beyond-Design-Basis Accidents», the personnel number has been increased by 2 staffing positions, that is, the staff of Rosenergoatom totals 65.

Personnel actions in response to beyond-design-basis and severe accidents are trained on full-scale simulators by way of emergency response drills and according to the schedule of integrated emergency response exercises at different NPPs.

To ensure and improve the emergency preparedness:

- it is planned to improve the protection of the main and emergency NPP control rooms;
- portable mobile emergency response equipment is available at all Russian NPPs in operation;
- the operator has its own Crisis Center;
- the operator has a nuclear plant assistance team;
- each NPP has a protected emergency response management room;
- mobile control rooms (mobile communication stations) are established at each NPP for the emergency response leader and the nuclear plant emergency assistance (OPAS) team leader;
- activities are under way to back up the NPP software and hardware systems for transmission of data to the Crisis Center and the protected control room of Rosenergoatom.

Issues involved in the formation and improvement of safety culture and accounting of the human factor within Rosenergoatom are part of routine (everyday) activities and are not regarded as part of the post-Fukushima measures. At the same time, the results of considering the Fukushima-Daiichi events were taken into account in the development of measures aimed at preventing wrong personnel actions and improving the efficiency of emergency response management and actions aimed at coping and doing away with the consequences of the accident.

«Procedures for Organizing Activities to Prevent Wrong Personnel Actions» have been developed and are implemented, which address the prevention of wrong personnel actions as a component of safety culture and are set specifically at:

- increasing the scope of operating personnel training;
- hiring psychologists and human factor instructors for carrying out simulator training and

emergency response drills;

- making psychological training an integral part of personnel training with emphasis placed on the following: self-control in activities, psychology of errors, team work, stress control in emergencies and more.

As part of improving the efficiency of emergency response management, it is planned to:

- double the number of emergency response drills;
- upgrade/establish mobile management rooms for the emergency response leaders and the OPAS team leader;
- improve the reliability of communications in conditions of beyond-design-basis accidents, including specifically introduction of a shared radio communication system at NPPs;
- updating of emergency response documentation, to reflect in same, specifically, scenarios with operational occurrences (accidents) affecting several units of a multi-unit NPP at a time.

The structure of the Branch Emergency Prevention and Response System (OSChS) is described in detail in Section 16.2. The system includes the establishment of Technical Support Centers (TSC) within design and research organizations and within leading Russian institutes and enterprises which provide scientific and technical support to NPPs. Where required, these TSCs are expected to provide NPPs with operational information support.

At the level of the operator, actions are coordinated with other organizations involved in response to a radiological accident or a radiation-hazardous situation, as well in emergencies caused by natural or technogenic factors as may result in a radiological accident through the Nuclear Plant Emergency Assistance (OPAS) Team.

The required personnel number and the quantity of other resources for emergency response are estimated based on results of integrated emergency response exercises. The scenarios of integrated emergency response exercises are as realistic as possible. Exercises include training in organizing emergency response activities and personnel interaction at the affected site and at the Situation and Crisis Center (a branch center of Rosatom), the Crisis Center (Rosenergoatom) and Rostekhnadzor's Information and Analytical Center.

Q.No	Country	Article	Ref. in National Report
38	France	Article 6	Annex 3 - p. 143
Question/Comment	Following the Fukushima Daiichi NPP accident, Russian Federation developed a severe accident management guide (SAMG) on a WWER-1000 reactor. Will Russian Federation identify additional accident management measures on the basis of a level 2 PSA?		
Answer	<p>At present time, Russia has developed the «Severe Accident Management Guide» (SAMG) for all VVER-1000 units.</p> <p>The working SAMGs developed based on the model SAMG and taking into account the specific features of the unit and the NPP has been so far put into operation only at Balakovo 4.</p> <p>As specified in «Updated Measures to Mitigate the Consequences of Beyond-Design-Basis Accidents at NPPs», the working SAMGs for all NPP units with VVER reactors will be developed in 2014.</p> <p>The SAMG for the RBMK, BN and EGP-6 units will be developed in 2015-2016 as a separate document or as part of the Beyond-Design-Basis Accident Management Guide.</p>		
Q.No	Country	Article	Ref. in National Report
39	France	Article 6	Annex 9 and 10 - p. 156 and 157

Question/Comment Russian Federation states that during the three-year-period (2010-2012), 142 incidents were reported to the regulatory authorities by licensees. Could Russian Federation give

more details about the reporting criteria to the regulatory authorities? Is there a periodic assessment carried out to ensure the licensees report all the deviations that need to be reported? Could Russian Federation explain the meaning of «out of scale» from the INES events? Could Russian Federation explain the reasons for an increasing trend of operational events during this period?

Answer

1. As to criteria for making regulatory authorities aware of the events taking place at NPPs, these are set out in the federal code entitled «Provisions on the Procedures for Investigating and Accounting Malfunctions at Nuclear Plants» (NP-004-08).
2. Each event and its category are regularly assessed by the operator. The assessment by regulatory bodies is performed regularly at the NPP sites and within the central staff as information on events and reports on the NPP malfunctions arrive.
3. «Out of scale» events mean the events that were not previously classified under the INES and were regarded as «out of scale» in accordance with the INES User Guide (2001 edition). In other words, these are the events other than pertaining to nuclear or radiation processes, for instance, the events with a turbine or a generator which affects only the serviceability of the turbine or the generator and do not affect safety-related components. The effective INES User Guide (2008 edition) does not use this term and the events other than relating to safety in terms of radiation and nuclear safety assurance simply «are not classified on this scale».
4. A growth in the number of operational occurrences throughout 2010-2012 was caused by failures of new equipment during the new unit commissioning at the Rostov NPP in 2010 and at the Kalinin NPP in 2012, and by large-scale upgrading of unit 5 at the Novovoronezh NPP in 2011.

Q.No 40	Country Germany	Article Article 6	Ref. in National Report page 136, Appendix 1
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Question/
Comment

According to information in Appendix 1 of the national report, Kursk 5 and Balakovo 5 units were licensed for construction.

Please provide information on the status of the construction?

Answer

In fact, Rostekhnadzor has licensed the construction of Kursk 5 and Balakovo 5. Later, however, for a number of reasons:

- the construction of Kursk 5 has been stopped with the facilities not completed, which are part of unit 5's startup complex, being conserved as required by the Capital Construction Project Conserving Regulations approved by the Russian government decree No. 802, dated 30.09.2011, (resolution by Rosatom dated 15.08.2012);
- construction of Balakovo 5 was suspended.

Q.No 41	Country Germany	Article Article 6	Ref. in National Report section 6.5, page 22
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Question/
Comment

Section 6.5 states that starting from 2008 efforts are under way to uprate operating nuclear units.

Which units did obtain a permit for operation at a higher power level?

Answer

Rostekhnadzor's licenses for the operation of NPP units at an increased power level of 104 % Nnom have been granted to 9 NPP units with VVER-1000 reactors:

- Balakovo 1, 2, 3 and 4;
- Kalinin 1, 2 and 3;
- Rostov 1 and 2.

Rostekhnadzor's license has also been granted for the operation of the NPP unit with the

VVER-440 reactor (Kola 4).

Q.No 42	Country Germany	Article Article 6	Ref. in National Report section 6.6, page 23
Question/ Comment	<p>In the report it is stated that the main issue with the existing RBMK-1000 units of the first generations is the process of graphite stack form change.</p> <p>Does it have some influences on the issued licenses for operation beyond their design service life for any RBMK units of the first generation?</p>		
Answer	<p>Yes, it does.</p> <p>Graphite stack forming for existing units RBMK-1000 of first generation leads to the need for changes in license amendments.</p>		
Q.No 43	Country India	Article Article 6	Ref. in National Report Page 16 and 18
Question/ Comment	<p>It is mentioned that post Fukushima safety reassessment of Russia's NPPs, a number of issues were revealed, in particular:</p> <ol style="list-style-type: none"> 1. At Units 3 and 4 of Novovoronezh NPP robustness of the turbine hall roof is not ensured in case of extreme wind of speed over 35 m/s; robustness of ODS is not ensured in case of a tornado of class 3.2 as per the Fujita Scale; 2. At Smolensk NPP insufficient robustness with regard to an impact of shock wave in excess of 1.5 kPa of some enclosing parts was revealed. <p>Can you share the information, what action has been taken for resolution of the above issues?</p>		
Answer	<p>Units 3 and 4 of Novovoronezh NPP were commissioned in 1971 and 1972, respectively. They were designed to that-time safety standards and regulations and state standards. At the present time it is impossible and unreasonable to change designs of these buildings; their damages do not affect safety of the reactors and no building damages due to the said cause have been recorded over 42 years of operation.</p> <p>In case the buildings are damaged by wind load or tornado, depending on consequences, these damages will be eliminated and the units will continue operation.</p> <p>Article 6.2 of the Report states that completion of the work to ensure robustness of outer enclosing structures at units of Smolensk NPP with regard to an impact of shock wave in excess of 1.5 kPa is planned not later than 2014.</p> <p>The measures include strengthening of wall panels of the main building and strengthening of structures of the central hall arched roof.</p>		
Q.No 44	Country India	Article Article 6	Ref. in National Report Page 17
Question/ Comment	<p>It is mentioned that at some stations in Russia, heat removal from the reactor cores as well as SNF cannot be maintained for unlimited period of time. What is the SBO autonomy time for such stations and any measures to enhance the capability ?</p>		
Answer	<p>To manage beyond design basis and severe accidents in case the station blackout and/or loss of ultimate heat sink, additional emergency equipment has been delivered to the Russian NPPs, i.e. diesel generators, high-pressure diesel-driven pumps and motor pump to make-up the reactor, steam generators, spent fuel pools and pools of stand-alone spent fuel storage facilities.</p> <p>The use of the additional mobile emergency equipment will ensure removal of heat from the reactor core, spent fuel pools and pools of stand-alone spent fuel storage facilities. According to experts' estimates, this will increase safety, «survivability» and independence of the Russian NPPs no less than 5 days in case of a beyond design basis</p>		

and severe accident, including in case of the station blackout.

The time period of 5 days is required to carry out works to recover power supply of the plant from the off-site grid.

Q.No 45	Country India	Article Article 6	Ref. in National Report Page 19
Question/ Comment	In 2012, Rosenergoatom, performed robustness analysis, with regards to extreme events, of units under construction. Can Russian Federation share any major outcome of this analysis and expected changes in its construction or layout methodologies based on it?		
Answer	Main results of the robustness analysis of NPP units under construction, as regards external impacts, were the changes in the master plan of a NPP unit construction conditioned by additional design solution to increase robustness, specifically: - design and construction of pads of specific quality for placing the equipment (diesel generators, motor pump, diesel-driven pumps, fuel storages); - design of special roads for delivery of this equipment to the main building of the unit so to exclude obstacles for transportation, i.e. falling of seismically unsafe structures on the road, spills of combustible fluids and other.		
Q.No 46	Country Japan	Article Article 6	Ref. in National Report 6.2, p15
Question/ Comment	It is clear that the Russian regulatory body and the Russian operator eagerly reassessed the robustness of NPPs. 1. Was the assessment results t by Rostekhnadzor published as documents or news release? 2. Was the assessment results of Rosenergoatom published or the fact that the report was filed is released to public by Rostekhnadzor?		
Answer	Main results of the stress tests reports reviews are reflected in the Executive Summary Report on results of additional protectiveness analyses of operating NPPs in Russia against extreme external events, which was published in No. 1(63) 2012 in the journal «Nuclear and Radiation Safety» and posted to Rostekhnadzor's website. Results of activities of the Regulatory Body and Operating Organization after the accident at Fukushima-Daiichi NPP have been very widely presented to the public both as published documents and news items. For example, Rostekhnadzor's website contains, in particular: the information on key results of the additional robustness assessments of the Russian NPPs, «Rosenergoatom's measures to mitigate consequences of severe accidents at Russian NPPs considering the lessons learned from the accident at Fukushima-Daiichi NPP,» as well as an implementation schedule for these measures. Besides, basing on results of the additional assessments and drafting of action programs to improve safety of Russian NPPs and the emergency response system effectiveness, as well as to enhance effectiveness of the Russian safety regulatory system, the Regulatory Body and Operating Organization have provided comprehensive press releases, conducted briefings and press conferences, and published information in the federal and corporate mass media.		
Q.No 47	Country Japan	Article Article 6	Ref. in National Report 6.4, p20
Question/ Comment	Concerning to life extension, According to the list of table 6-1, granted licenses for operation beyond design service lives varies 5 years for Kola-3 to 15years for Leningrad-4.		

Could you explain main reason for these variations?

Could you explain the process of lifetime extension application and the process of reviewing?

Is any special inspection requested as the prerequisite for the approval for the life extension?

Answer The application process for extending the life and the process of its review in accordance with the RTN administrative regulations for licensing .
RTN operating license is issued for a period determined individually for each unit on the basis of the examination of documents justifying the operating organization.
If during the examination the need to perform additional studies and/or work for the requested additional years of service is identified, then up to perform these studies and/or work , this period may be reduced to such a period during which the safe operation of the plant on the basis of the examination is considered justified.
Special targeted inspections NPP unit for issuing a permit for the extension of services are held.

Q.No 48	Country Pakistan	Article Article 6	Ref. in National Report Table 6.1, Page 21
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Question/ Comment Reference Table 6.1, the list of the units that were granted license for operation beyond their design service life is provided. Russian Federation may give some details about the safety assessment of life limiting equipments such as Steam Generators and RPVs.

Answer The calculation assessment of RPV marginal states with regard to the brittle structure criterion has demonstrated that it is possible to operate VVER pressure vessels at NPP units up to 60 years:
- in case of VVER-1000 it is possible without recovery annealing, except for reactor pressure vessels of Balakovo-1 and Rostov NPP, which weld metal contains a higher content of nickel and which safe operation is ensured until 2019 and 2025, respectively. The deadline for compensatory measures at Rostov-1 can be refined after additional tests of witness-specimens;
- in case of VVER-440/213 it is possible without recovery annealing;
- in case of VVER-440/230 (first generation) it is possible without recovery annealing, except for Kola-2.
The assessment of the technical condition and residual lifetime of steam generators is carried out in accordance with guiding documents of Rosenergoatom.
The residual lifetime of steam generators is calculated basing on reserve of heat-exchange tubes, which can be plugged without a reduction of the unit load below 100%. The reserve of heat-exchange tubes is calculated using the cited methodology, proceeding from the tube plugging dynamics (rate), presence and growth rate of flaws in heat-exchange tubes. In case of repair and recovery operations at the steam generator shells, the steam generator residual lifetime is calculated, among other, with the account taken of permissible total time of heat treatments of SG shell components being repaired.

Q.No 49	Country South Africa	Article Article 6	Ref. in National Report Page 15
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Question/ Comment Seismic safety reassessment: Beyond design seismic assessments were performed on the respective facilities. What is the seismic design basis for the plants? What was the beyond design seismic loads considered in the safety reassessment? At what levels and for what safety equipment were potential cliff edge effects identified that warrants corrective or improvement measures?

Answer The Table given in the appendix to this answer shows the seismic design bases of

operating NPPs.

Seismic design bases for AES-2006 design:

- building structures of Novovoronezh II design as well as process pipelines, other utilities and structures developed by the designer organization are designed proceeding from the seismic impacts as follows:

- design basis earthquake: 6 points, MSK-64,

- safe shutdown earthquake: 7 points, MSK-64;

- equipment and system components are designed in consideration of seismic impacts as follows:

- design basis earthquake: 7 points, MSK-64,

- safe shutdown earthquake: 8 points, MSK-64.

Seismic design bases for VVER-TOI design:

- design basis earthquake: 7 points, MSK-64,

- safe shutdown earthquake, basic version: 8 points, MSK-64,

- safe shutdown earthquake, option: 9 points, MSK-64.

Beyond design basis seismic loads were considered in the additional safety assessments. Cliff edge effects were identified for the expert level earthquakes (as a rule, 1.4 SSE) in the course of seismic qualification of buildings, structures and equipment of individual units of operating NPPs basing on the marginal seismic stability method.

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Table - Seismic design bases of operating NPPs

Nuclear power plant	Design basis earthquake (DBE), points, MSK-64	Safe shutdown earthquake (SSE), points, MSK-64
Balakovo	6	7
Beloyarsk	5	6
Bilibino	4	5
Kalinin	4	5
Kola	4	5
Kursk	5	6
Leningrad	5	6
Novovoronezh	4	5
Rostov	6	7
Smolensk	5	6

Q.No 50	Country South Africa	Article Article 6	Ref. in National Report Pae 17
Question/ Comment	Preparedness to manage accidents caused by loss of in-house power (station blackout) at NPP: What is the design basis for SBO scenarios? Were any modifications or measures identified to improve the time available for operators to implement measures to restore power? What are the Regulatory requirements/expectations on SBO following Fukushima?		
Answer	<p>To ensure in-house power at NPP units, their designs provide for the use the main and back-up sources. For example, for Leningrad NPP the main power source is off-site 330 and 750 kV electricity transmission lines and the alternative source is Narva Hydroelectric Station with 110 kV electricity transmission lines.</p> <p>To manage beyond design basis and severe accidents in the station blackout and/or loss of ultimate heat sink situation additional emergency equipment has been delivered to the Russian NPPs, i.e. diesel generators, high-pressure diesel-driven pumps and motor pump to make-up the reactor, steam generators, spent fuel pools and pools of stand-alone spent fuel storage facilities.</p> <p>The use of the additional mobile emergency equipment will ensure removal of heat from the reactor core, spent fuel pools and pools of stand-alone spent fuel storage facilities. This</p>		

will increase safety, «survivability» and independence of the Russian NPPs no less than 5 days in case of a beyond design basis and severe accident, including in case of the station blackout.

The time period of 5 days is required to carry out works to recover power supply of the plant from the off-site grid.

The requirement for compulsory availability of engineering features to manage accidents associated with the station blackout to the plants was introduced in the «General safety provisions of nuclear plants» which is under revision process.

Q.No	Country	Article	Ref. in National Report
51	South Africa	Article 6	Page 17
Question/ Comment	Preparedness to manage accidents involving loss of the ultimate heat sink: What additional measures are being considered to cope with the loss of ultimate heat sink scenarios? What are the Regulatory requirements/expectations of this type of scenario?		
Answer	<p>In review the « General safety of nuclear power stations» (OPB-88/97) requirement for the nuclear power station hardware management -related accidents with loss of heat removal systems design to the final absorber is included.</p> <p>Under the «stress tests» the operating organization performed the analysis of accident with loss of technical means, realising heat transfer to the ultimate heat sink. The characteristic times of the processes and possible measures for accident management were identified. On the results of «stress tests» of the operating organization decided to equip the NPP units with additional technical means (mobile pumps, diesel pumps, diesel generators, etc.) for the management of this type of accident.</p> <p>To manage beyond design basis and severe accidents in the station blackout and/or loss of ultimate heat sink situation additional emergency equipment has been delivered to the Russian NPPs, i.e. diesel generators, high-pressure diesel-driven pumps and motor pump to make-up the reactor, steam generators, spent fuel pools and pools of stand-alone spent fuel storage facilities.</p> <p>The use of the additional mobile emergency equipment will ensure removal of heat from the reactor core, spent fuel pools and pools of stand-alone spent fuel storage facilities. According to experts' estimates, this will increase safety, «survivability» and independence of the Russian NPPs up to 5-10 days in case of a beyond design basis and severe accident, including in case of the station blackout.</p> <p>The time period of 5-10 days is required to carry out works to recover power supply of the plant from the off-site grid.</p> <p>As a general approach to compensate for the loss of ultimate heat sink in case of a severe accident at a NPP with pressure-tube and fast neutron reactors, the emergency mobile machinery has been procured (diesel generators, diesel-driven pumps and motor pump), which is intended for power supply to the unit's standard pumping gear, as well as for water supply from back-up sources to the reactor loop (except for BN-600 reactor) and to cool spent fuel in the at-reactor hold-up pools and pools of stand-alone spent fuel storage facilities.</p> <p>At some units it is possible to use fire trucks for water supply to cool the reactor and spent fuel pools.</p> <p>At plants with RBMK-1000 reactors it is possible to arrange air cooling of the reactor by air flows running through the rooms where the reactor steam separators and steam-water lines are located.</p> <p>At the plant with BN-600 reactor an additional emergency cooldown system with air heat exchanger has been commissioned. The system is designed to remove residual heat from the reactor to the atmosphere in all situations associated with failures of the essential emergency cooldown system (through the tertiary circuit).</p>		

These measures were approved by Rostekhnadzor and acknowledged sufficient. In frames of stress tests the Operating Organizations was required to analyze the loss of ultimate heat sink scenario and identify typical timeframes of processes and potential accident management measures. Following the stress tests results the Operating Organization made a decision to outfit NPP units with additional engineering features (mobile diesel generators) to manage accidents of this type. The requirement for compulsory availability of engineering features to manage accidents associated with the loss of design systems for heat removal to the ultimate heat sink was introduced in the «General safety provisions of nuclear plants» which is under revision process.

Q.No	Country	Article	Ref. in National Report
52	Switzerland	Article 6	6.2, p. 16
Question/ Comment	In chapter 6.2, the basic results of the safety reassessment of the Russian NPPs are given. Regarding flooding, it is stated that the sites of all Russian plants are protected against hazards from extreme water levels in water bodies, abnormal situations at hydraulic structures as well as combinations of the said factors, so that flooding that would affect safety important systems and components can be excluded. According to page 109, a probability of exceedance of the extreme flood of 0.01 % was assumed. Could you please outline by which measures or site characteristics the protection was achieved?		
Answer	<p>In the course of the stress tests, the analysis of potential flooding of NPPs with VVER reactors resulted in the conclusion that in case of an extreme flood combined with abnormal situations at hydraulic structures located upstream the river, the dam existing at Novovoronezh NPP will not protect pumps of the system that removes heat to the ultimate heat sink, i.e. Units 3 and 4 essential consumers' service water supply system. To ensure workability of the system for heat removal to the ultimate sink - Units 3 and 4 essential consumers' service water supply system – Novovoronezh NPP made a decision to replace existing service water pumps with state-of-the-art pumps, which are seismically resistant, and elevate them up to approximately two meters to rule out their flooding with water in case of an extreme flood combined with abnormalities at the hydraulic structures. There is no threat of flooding at other Russian NPPs with VVER reactors.</p> <p>At Bilibino NPP potentially it is possible that water ingresses elevations below the ground level of the unit if the ground water level rises due to long storms, but this is not typical of this site. The design provides for means of water removal from the elevations below the ground level; this equipment can be used also to remove water incoming due to groundwater rises.</p> <p>The site of Beloyarsk NPP is not susceptible to flooding due to external sources. Potentially, water can ingress elevations below the ground level of the unit in case of long storms (but these are untypical of Beloyarsk NPP site). The unit design provides for relevant engineering features for water removal from elevations below the ground level, which are used mainly in case the process water lines lose integrity. These features can be used also to remove water seeping to elevations below the ground level due to groundwater rises.</p> <p>The site of Kursk NPP due to design solutions is out of the flooding threat. The cooling pond dam strength is justified by its design solutions of the structure pertaining to Solidity Class I, taking account of a seismic load of 7 points of the seismic calculations.</p> <p>The site of Smolensk NPP is prevented to the thread of the external flooding. Even in case of a hypothetical accident involving the cooling pond dam break and maximum break wave, the plant territory cannot be flooded because its elevation is higher than that of the normal setup level of the cooling pond.</p> <p>The site of Leningrad NPP is situated on two sea-shore terraces. Main buildings are not</p>		

susceptible to flooding. Three buildings are vulnerable to the maximum design flood, but design special measures are provided in this case

Q.No 53	Country Switzerland	Article Article 6	Ref. in National Report 6.2, p. 17
Question/ Comment	Regarding preparedness to manage accidents involving loss of the ultimate heat sink (UHS), the statement in the Russian report on page 17 concerning the results of the UHS analyses is not quite clear. Please elaborate on the need of a diverse UHS for the Russian NPPs. Is it intended to ensure a diverse UHS by means of accident management?		
Answer	<p>To manage beyond design basis and severe accidents in the station blackout and/or loss of ultimate heat sink situation additional emergency equipment has been implemented at the Russian NPPs, i.e. diesel generators, high-pressure diesel-driven pumps and motor pump to make-up the reactor, steam generators, spent fuel pools and pools of stand-alone spent fuel storage facilities.</p> <p>The use of the additional mobile emergency equipment will ensure removal of heat from the reactor core, spent fuel pools and pools of stand-alone spent fuel storage facilities at the expense of water supply to the reactor, pools or steam generators along with removal of steam resulted from boiling to the ultimate heat sink, the atmosphere.</p> <p>This will increase safety, «survivability» and independence of the Russian NPPs up to 5-10 days in case of a beyond design basis or severe accident.</p> <p>As a general approach to compensate for the loss of ultimate heat sink in case of a severe accident at a NPP with pressure-tube and fast neutron reactors, the emergency mobile machinery has been procured (diesel generators, diesel-driven pumps and motor pump), which is intended for power supply to the unit's standard pumping gear, as well as for water supply from back-up sources to the reactor loop (except for BN-600 reactor) and to cool spent fuel in the at-reactor hold-up pools and pools of stand-alone spent fuel storage facilities.</p> <p>Diversification of the ultimate heat sinks is achieved as follows.</p> <p>At some units it is possible to use fire trucks for water supply to cool the reactor and spent fuel pools.</p> <p>At plants with RBMK-1000 reactors it is possible to arrange air cooling of the reactor by air flows running through the rooms where the reactor steam separators and steam-water lines are located.</p> <p>At the plant with BN-600 reactor an additional emergency cooldown system with air heat exchanger has been commissioned. The system is designed to remove residual heat from the reactor to the atmosphere in all situations associated with failures of the essential emergency cooldown system (through the tertiary circuit).</p>		
Q.No 54	Country Ukraine	Article Article 6	Ref. in National Report para 6.2 page 18
Question/ Comment	Do measures on providing all plants with engineering features for management of beyond design basis accidents take into account all operational states of reactor, including shutdown with uncovered reactor?		
Answer	The use of engineering features to manage beyond design basis accidents, the Russian NPPs are being outfitted with, is planned in line with beyond design basis accident management guides and relevant emergency procedures, which will be updated in the course of implementation of additional design solution directly at the units. The updating will be done basing on beyond design basis and severe accident scenarios, proceeding from revised lists of beyond design basis accidents for units of all types, which actually cover all operational states of a specific reactor installation.		

The mobile emergency equipment (mobile emergency diesel generators, mobile high-pressure pumps and motor pump), which has been supplied to NPPs, can be used for elimination or management of accidents in all operational states of the reactor installation, including shutdown with «uncovered» reactor.

Q.No 55	Country Ukraine	Article Article 6	Ref. in National Report para 6.1 page 18
Question/ Comment	Is it planned to implement additional (not included in the design) features for primary system makeup for VVER NPPs in case of long-term station blackout and additional (dependent) failure involving coolant leaks?		
Answer	<p>In case of a prolonged loss of power at the plant and a loss of coolant failure, the VVER designs provide for a possibility of delivery and installation of an additional diesel-driven high-pressure pump to make-up the reactor and primary circuit with a boric acid solution from the design boric acid storage tank.</p> <p>Also, all VVER units, in case of such accident, have a possibility to arrange for make-up of the reactor and primary circuit by one of the design boric acid pumps, which would supply a boric solution to the primary circuit and would be powered by the mobile emergency large-capacity diesel generator.</p>		
Q.No 56	Country Ukraine	Article Article 6	Ref. in National Report Annex III, page 141-142
Question/ Comment	<p>Regarding post-Fukushima measures on implementation of additional mobile equipment:</p> <ol style="list-style-type: none"> 1. Is it planned to construct separate buildings with increased robustness regarding external hazards to protect mobile emergency response equipment at NPPs? 2. What systems and equipment will be powered from mobile 2.0 MW diesel generators? 		
Answer	<ol style="list-style-type: none"> 1. There are no plans to erect stand-alone buildings of higher seismic robustness with regard to external impacts to protect mobile emergency equipment. Some emergency equipment (mobile large and medium-capacity diesel generators and mobile diesel-driven high-pressure pumps) was initially installed in protective containers and located near the power unit; the rest of emergency equipment is located in designated places and light-weight protective structures are planned for it where necessary. <p>Also, there is a possibility of transporting the mobile emergency equipment from one NPP unit to the accident-affected one.</p> <ol style="list-style-type: none"> 2. From mobile emergency diesel generators of high power (2.0 MW) at units of various types can be supplied with any system design and equipment (through design rechargeable battery or directly from a diesel generator, which has a separate output 220 V DC), but within the design capacity of diesel generators and considering inrush currents when the high-power pumps, for example, project management and technical means of measurements: <ol style="list-style-type: none"> 1) instrumentation of the system «Emergency I&C»; 2) APCS – automatic process control system (including system for information transmission to the Crisis Center of Rosenergoatom and «black box» subsystems; 3) NFMS – reactor neutron flux monitoring system; 4) RLI – reactor level indication system; 5) HOCMS – reactor containment hydrogen and oxygen continuous monitoring system; 6) RSMS – radiation safety monitoring system; 7) ARMS – automatic radiation monitoring system; 8) YR – hardware for shutting off accumulator tanks from the reactor; 9) instrumentation of the control post in the stand-alone spent nuclear fuel storage facility. <p>Besides, it is necessary to arrange power supply from a mobile emergency diesel generator to support continuous or periodic operation of the following process equipment 6 kV and</p>		

0.4 kV:

- 1) service water pump of essential consumers;
 - 2) pump for supply of boric acid to the primary circuit;
 - 3) cooldown pump of the spent nuclear fuel pool;
 - 4) BRU-A – fast-acting atmospheric exhaust station;
 - 5) valves of the emergency gas evacuation system of the reactor and primary equipment.
- At plants with RBMK-1000 reactors, the mobile diesel generators 2.0 MW are used to power: consumers 6 kV (cooling pumps of the affected and unaffected halves of the reactor), consumers 0.4 kV (clean condensate pumps, second set of the uninterruptible power supply of the integrated control, monitoring and protection system, ventilation and air conditioning system of the local shutdown panel, control cabinet of main safety valves), consumers 0.22 kV (evacuation lighting and emergency lighting of premises required for operations to localize a beyond design basis accident, control cabinet of main safety valves).

Q.No	Country	Article	Ref. in National Report
57	Ukraine	Article 6	page 20
Question/ Comment	According to international experience and practices, equipment qualification for harsh environments and seismic impacts is a part of the lifetime extension process. Is equipment qualification in the framework of life extension program provided in the Russian Federation? What regulatory documents set requirements for equipment qualification process?		
Answer	<p>The equipment qualification is carried out in accordance with the schedule approved by Rosenergoatom and the guide «Qualification of the equipment in harsh environment and seismic impacts. Standard methodology.»</p> <p>As per requirements of NP-017-2000 «Basic requirements for life extension of a nuclear power unit,» duration of operation in excess of the assigned service life is established considering technical and economic factors, which include, among other, availability of sufficient residual service life of non-restorable equipment of the NPP power unit.</p> <p>This document also cites key measures to be implemented by the Operating Organization to extend lifetime of the NPP power unit beyond the assigned lifetime, in particular:</p> <ul style="list-style-type: none"> • a comprehensive examination of the power unit; • preparation of the power unit for operation during the extended service life period, including assessments of safety and residual lifetime of components, replacement of equipment that exhausted their lifetimes, and, if required, modernization and refurbishment of the NPP power unit; • required tests. 		
Q.No	Country	Article	Ref. in National Report
58	Ukraine	Article 6	page 20
Question/ Comment	<p>The outcome of life extension process «is submitted by Rosenergoatom to Rostekhnadzor for an independent review and issue of a license for unit operation beyond its original lifetime».</p> <p>Please clarify the following aspects:</p> <ul style="list-style-type: none"> - What is the final document that justifies the possibility of life extension (safety analysis report, periodic safety review report, etc.)? - Does regulations in Russian Federation establish time limit for review of documents that justify life extension? 		
Answer	<p>The final document that justifies lifetime extension possibility is the in-depth safety analysis report (ISAR).</p> <p>The deadline for review of lifetime extension justification materials is set forth in the</p>		

Administrative Regulation on Implementation of the State Function of Licensing Activities in the Field of Nuclear Energy by the Federal Environmental, Industrial and Nuclear Supervision Service.» According to the regulation, the review period should not exceed 95 days, without considering the time of the expert review of documents submitted by the applicant (licensee), which justify nuclear and radiation safety of nuclear installations, radiation sources, nuclear material, radiation substances storage facilities, radioactive waste storage facilities and (or) declared activity (this takes account of fulfillment of administrative procedures in parallel; deadlines for these procedures are also set forth in the Regulation).

The Regulation also sets forth maximum duration of the expert review with the account taken of facility categories. For nuclear power plants it is – 12 months.

Q.No 59	Country Ukraine	Article Article 6	Ref. in National Report page 16
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Question/ It is indicated in para. 6.2 that safety reassessments at Russian NPPs found that not all power units in Russia were equipped with a seismic monitoring and alarm system linked to the reactor emergency protection system. What measures have been planned or carried out in this respect?

Answer There are 33 NPP units in operation in Russia.
The seismic protection systems (SPS) have been deployed and are in operation (at some units on pilot commercial scale) at 15 NPP units. The seismic protection system includes alarms and reactor scram system at information received from seismic measurement instruments.
The work is under way to implement the seismic protection systems at all the rest of 18 NPP units:
- in 2014 – at Bilibino 1-4; Kola 1-4 and Smolensk-1,3 (SPS was commissioned for the pilot commercial operation at Smolensk-2 in 2013);
- in 2015 – at Leningrad 1-4 and Kursk 1-4.

Q.No 60	Country United States of America	Article Article 6	Ref. in National Report 6.2
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Question/ Short term measures to address Fukushima identified that plants have been fitted with engineering features, such as diesel generators, diesel driven pumps, etc, however, it is not clear if this is permanently installed equipment or mobile equipment.

(1) Please clarify if this is referring to mobile equipment.

Page 109 of the report indicates mobile equipment will be provided. Also many stations have provided mobile equipment at the plant as well as having regional supply centers to obtain these resources in extreme external events.

Answer Indicate what is the location of the mobile equipment.
1. Before the accident at Fukushima-Daiichi NPP, the additional emergency equipment to manage beyond design basis accidents was supplied to only two NPPs with VVER-440 of old designs:
- Novovoronezh NPP: a mobile emergency diesel generator 2.0 MW (Sweden) and a mobile high-pressure diesel-driven pump (USA, 1998) for emergency make-up of steam generators;
- Kola NPP: a mobile emergency diesel generator 1.8 MW (Norway) and three fixed emergency high-pressure diesel-driven pumps (Norway, 2001) for emergency make-up of steam generators at all four units of the plant.

2. Within ROSATOM there is Novovoronezh Emergency Technical Center, which is fitted with all necessary equipment and materials for elimination of beyond design basis accident consequences at all Russian NPPs. It doesn't have high-capacity diesel generators and high-pressure diesel driven pumps, which can be used with the design systems of the plants. Also, due to large distances, it is impossible to shortly deliver heavy equipment from Novovoronezh to other plants, connect it to the plant systems and start operating them.

3. Basing on an expert estimate and proceeding from the technical need, in 2012 the following mobile emergency equipment, which uses air-cooled diesels, was supplied to all operating plants in Russia.

To each NPP power unit:

- a high-capacity diesel generator – 1 per unit;
- a medium-capacity diesel generator - 1 per unit;
- a mobile high-pressure pump - 1 per unit;
- motor pump of different pressure and flow rate - 3 per unit.

To each stand-alone spent nuclear fuel storage facility:

- a medium-capacity diesel generator - 1 per storage facility;
- a medium-pressure pump - 1 per storage facility;
- motor pump - 1 per storage facility.

To shielded control posts of the plants (in the satellite-city and evacuation region):

- diesel generators – depending on a control post project.

The said mobile emergency equipment is installed within the plant territory in locations, which are safe as regards floods and falling of structures of neighboring buildings.

The stress tests done to analyze NPP safety in design basis and severe accidents have demonstrated that to prevent a design basis accident development into a beyond design basis accident, the mobile emergency equipment should be put into operation within a short period of time, but this is difficult if the said equipment is far from the plant.

Therefore, the mobile diesel generators, mobile high-pressure diesel-driven pumps and motor pump at each NPP unit in Russia are installed in certain locations within the plant site near the places of their use and are connected to the plant systems where possible, if otherwise, everything should be in hand to connect them in an expedite manner.

If necessary, the mobile emergency equipment can be moved from neighboring (unaffected) units to the affected one.

Q.No 61	Country United States of America	Article Article 6	Ref. in National Report 6.4 and 6.5
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Question/ Comment (1) Please clarify if all the Russian stations are being considered for life extensions or uprates.

Answer (2) Please clarify if VVERs would be built to replace RBMK technology.

1. According to the Nuclear Power Development Program of the Russian Federation approved by the Resolution of Government of the Russian Federation No. 815 of 21.07.1998, all operating power units are considered as regards their service life extension, but not all of them have the licensee for service life extension. Power increase was considered for all units, but decided not to increase the power of RBMK, VVER first generation, EGP and BN.

2. As per ROSATOM's strategy, all power units with RBMKs will be shut down at the end of their extended service lives and their capacities will be replaced with new power units with VVER reactors.

Q.No 62	Country United States of America	Article Article	Ref. in National Report section 6.2
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Question/ Comment	<p>The report says that flooding that would affect safety important systems and components is incapable.</p> <p>Post-Fukushima walkdown evaluations in the US have been conducted at most of the stations, even those that consider flooding to be unlikely. These walkdowns have identified unforeseen weaknesses in door and penetration seals, storm drain routing, and building drains in walking down flooding protection.</p> <p>(1) Please clarify if you have conducted flooding walkdowns. (2) If yes, please share your findings and lessons learned. Also, share your corrective actions implementation plan. (3) If walkdowns have not been performed, please clarify if you have plans to conduct them in the near future.</p>		
Answer	<p>In the course of stress tests done in regard of potential flooding of plants with VVER reactors it was found out that in case of an extreme flood combined with abnormal situations at hydraulic structures located upstream the river, the existing dam of Novovoronezh NPP will not ensure protection of pumps of the system for heat removal to the ultimate heat sink, which is the service water system of essential consumers of Units 3 and 4.</p> <p>To ensure operability of the system for heat removal to the ultimate sink – the service water system of essential consumers of Units 3 and 4 of Novovoronezh NPP – a decision was made to replace the existing service water pumps with state-of-the-art, seismically robust ones and elevate them at approximately two meters up to exclude their flooding in case of an extreme flood combined with abnormal situations at the hydraulic structures. There is no a threat of flooding due to floods and abnormal situations at hydraulic structures at other Russian NPPs with VVER reactors.</p> <p>Also, an analysis was carried out as regards sufficiency of measures take to protect from flooding, i.e. sealing of doors and penetrations, building of storm drains and water removal from buildings. Following the analysis results, additional measures are planned as to additional sealing of doors and arrangements for pumping out water from NPP premises located at below-zero elevations, where safety important equipment is located. Therefore, in frames of targeted inspections of safety at NPP with regard to extreme impacts and considering the lessons learned from Fukushima-Daiichi accident, as well as stress tests done in 2011, all Russian NPPs were subjected to an extraordinary safety analysis, which covered issues related to flooding.</p> <p>Walkdowns and examinations of buildings, structures and their components, hydraulic structures, stormwater drainages, engineering features for water removal from below-zero elevations, as well as tests of the systems, are carried out on a regular basis in frames of maintenance and repair programs. Walkdowns of process premises of the power unit, equipment and components of systems by the personnel are conducted via an established route to check on conformance of their condition and behavior to requirements established in the rules, norms, regulations, job descriptions. They are also carried out in accordance with a schedule. All revealed non-conformities are recorded and eliminated routinely. Life extension of buildings, structures, equipment and pipelines is carried out in accordance with the established procedures, which include comprehensive examinations, diagnostics, development and implementation of measures for management of the power unit lifetime performance.</p>		
Q.No 63	Country Austria	Article Article 7.1	Ref. in National Report 7.1, p26-31

Question/ Comment Could you please share with us whether the major amendments that were introduced into the Federal Law «On the Use of Atomic Energy» are in compliance with the IAEA nuclear safety standard requirements? Did you follow IAEA safety documents, or good practice examples of selected countries in the process of creation and adaptation of the new Federal Law No. 190-FZ of 11 July 2011 «On the Management of Radioactive Waste and on Amendment of Certain Legislative Acts of the Russian Federation»?

Answer The changes to Federal Law No. 170-FZ «On the Use of Atomic Energy» were introduced by Federal Law No. 347-FZ of 30 November 2011 «On Amendments to Certain Legislative Acts of the Russian Federation for the Purposes of Regulation of the Safety in the Use of Atomic Energy.» The changes affect provisions, such as:

- division of responsibility and functions of the state safety regulatory bodies, bodies for control of the uses of atomic energy and operating organizations;
- independence of the state safety regulatory bodies;
- observance of international obligations and guarantees of the Russian Federation in the field of the use of atomic energy,
- periodic safety reviews of nuclear facilities,
- features of regulating activities associated with the use of radionuclide sources;
- scientific and engineering support organization of the state safety regulatory body;
- other.

All changes to No. 170-FZ comply with requirements of the IAEA nuclear safety standards.

Yes, in the course of drafting and implementing Federal Law No. 190-FZ of 11 July 2011 «On the Management of Radioactive Waste and the Amendment of Certain Legal Acts of the Russian Federation» the account was taken of provisions of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, recommendations of the IAEA and other international organizations as regards safe management of RAW, as well as national and international good practices of the RAW management.

Q.No 64	Country Canada	Article Article 7.1	Ref. in National Report Page 25
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Question/ Comment Please provide some details as to what restrictions, if any, Federal Law No. 190-FZ of 29 December 2004 «City Development Code of the Russian Federation» provides regarding atomic energy facilities.

Answer The City Development Code the Russian Federation (No. 190-FZ of 29 December 2004) introduced a constraint for supervision over nuclear and radiation safety at NPPs under construction, since its para 7 of Article 54 stated: «the state-level supervision over construction ... other than the state-level construction supervision is not permitted, as per this Code...»

Since the requirements of the federal norms and rules are applied to nuclear facilities already at the stage of construction (in case of NPPs they apply before the construction completion record), it was required to remove these constraints by relevant regulatory documents.

So the technical regulation on the safety of buildings and structures No. 384-FZ (Article 3 para 4) of 30 December 2009 states that it is necessary to observe requirements not only the Federal Law but also the requirements established by the federal executive authorities in the field of the state-level regulation of safety in the uses of atomic energy with regard to the facilities subject to nuclear and radiation safety requirements in the field of the use of atomic energy as well as processes of design (including surveys), construction, installation, adjustment, operation and disposal (demolition) associated with the said facilities.

The Governmental resolution No. 54 of 1 February 2006 «Regarding the State Construction Supervision in the Russian Federation» states that «the subject matter of the state construction supervision is the inspection of conformance of the work being carried out, construction materials in use and results of such work to the construction standards and regulations, federal norms and rules in the field of the use of atomic energy.» According to this resolution, the state-level supervision of construction and refurbishment of nuclear facilities is carried out in a combination with checks and inspections set forth by laws and other legal regulatory acts of the Russian Federation, which regulate relations in the sphere of safety ensuring of such facilities.

Similar requirements are formulated in the Provision on the Federal State Supervision in the Field of the Use of Atomic Energy approved by the resolution of the Government of the Russian Federation No. 1044 of 15 October 2012 and the Provision of the Regime of Continuous State Supervision at Nuclear Facilities approved by the resolution of the Government of the Russian Federation No. 373 of 23 April 2012.

After coming into force of the said regulations the constraints of the Code were removed and the two laws – No. 190-FZ «The City Development Code of the Russian Federation» and No. 170-FZ «On the Use of Atomic Energy» – started to be applied in a consistent manner.

Q.No	Country	Article	Ref. in National Report
65	Czech Republic	Article 7.1	Section 7.3/ Page 37
Question/ Comment	Do you have formalized procedure to undertake a gap analysis between newly IAEA requirements and the national legislative framework in order to draft revisions to the legislative framework to keep legislation up to date?		
Answer	<p>The Federal Law «On the Use of Atomic Energy» No. 170-FZ states:</p> <p>Article 2. Principles and objectives of the statutory regulation in the field of the use of atomic energy. Paragraph 7. «observance of the international obligations and guarantees of the Russian Federation in the field of the use of atomic energy.»</p> <p>Article 6. Federal standards and regulations in the field of the use of atomic energy. Paragraph 4. «The said standards and regulations shall take account of recommendations of international organizations in the field of the use of atomic energy, in which activities the Russian Federation participates.»</p> <p>Article 65. International agreements of the Russian Federation in the field of the use of atomic energy. «If an international agreement the Russian Federation is a party to establishes rules other than that provided in this Federal Law, the rules of the international agreement the Russian Federation is a party to shall apply.»</p> <p>The said provisions of Federal Law No. 170-FZ are the sufficient ground for taking account of recommendations of the IAEA standards, which are drafted with Russia's participation. This is the exact ground for taking account of the IAEA standards when drafting federal standards and regulations and their periodic revision in Russia. This was the ground for a comparison of OPB-88/97 with IAEA's new standards SSR-2/1 and SSR-2/2 to harmonize and take account of necessary changes to the new revision of OPB NPP, which is in the drafting process now.</p>		
Q.No	Country	Article	Ref. in National Report
66	South Africa	Article 7.1	7.3, 10.3
Question/ Comment	Could you please indicate the following as regards level of prescription in your regulatory system: Do your regulatory requirements/rules/regulations etc include quantitative requirements, e.g. level of defence-in-depth, such as single failure criterion, return frequencies of initiating events, risk metrics etc. Do your requirements include requirements for beyond design base accidents. If so what are these requirements and how		

are they established?

Answer The hierarchy's upper level standards and regulations OPB-88/97 contains requirements for the defense-in-depth concept, which are line with the IAEA recommendations as regards the single failure criterion. Frequency of initiating events in OPB-88/97 is not regulated directly, because risk indicators depend on it, for which OPB-88/97 sets forth rather stringent targets. For example, a value of total probability of severe beyond design basis accidents for one reactor per year estimated basing on the probabilistic safety analysis should not exceed $10E-5$, while an estimated probability value of an emergency radioactive substance release that requires evacuation of the public beyond the emergency action planning zone, which is established in accordance to the regulatory requirements for siting of the plant, should not exceed $10E-7$ for one reactor per year. OPB-88/97 also establishes requirements for the accounting of beyond design basis accidents. Such accidents include the accidents triggered by initiating events, which are not considered in case of design basis accidents, or accompanied by failures of safety systems in excess of the single failure and human errors, which are supplemental as compared to design basis accidents. Mitigation of consequences of such accidents pertains to Level 4 and Level 5 of the defense-in-depth: Beyond design basis accident management and Emergency planning, correspondingly. To manage such accidents, the accident management guides are produced, basing on the analysis of representative scenarios. At the defense-in-depth Level 5, off-site and on-site emergency action plans are produced to ensure protection of the personnel and the public in such accidents.

Q.No 67	Country Turkey	Article Article 7.1	Ref. in National Report 24
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Question/ Comment Is there any plan to become a party to «Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention, 1992» or «Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage, 1997»?

Answer The Russian Federation considers it expedient to join the «Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage» of 1997. The prerequisite for joining of the Russian Federation to the Protocol of 1997 is creation of a fully-functional, comprehensive, special-purpose legislative regulation in the field of civil liability for nuclear damage by means of adoption of a national law about civil liability for nuclear damage with simultaneous introduction of necessary alterations and additions to the current regulatory legal acts.

Q.No 68	Country Turkey	Article Article 7.1	Ref. in National Report 28
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Question/ Comment Regarding the amendment to the Article 9 of the «Federal Law No. 170-FZ of 21 November 1995 On the Use of Atomic Energy», please give more detail on the accreditation procedure in the field of the use of atomic energy. What is the aim of accreditation and what are the main steps of the procedure?

Answer The Governmental resolution No. 612 of 20.07.2013 «Regarding the accreditation in the field of the use of atomic energy» introduced «The rules of accreditation of the certification authorities and testing laboratories (centers), which carry out activities to verify conformance of products subject to requirements associated with safety ensuring in the field of the use of atomic energy. The accreditation of the certification authorities and testing laboratories (centers), which carry out activities to verify conformance of products subject to requirements associated with safety ensuring in the field of the use of atomic energy, as well as qualification of the accreditation experts, is carried out by ROSATOM. The Governmental resolution No. 612 proposes ROSATOM to define key accreditation stages and procedures within 9-month

period, i.e. by May 2014.

Q.No 69	Country Turkey	Article Article 7.1	Ref. in National Report 31
Question/ Comment	What is the legal status regarding foreign origin nuclear spent fuel reprocessing and the waste generated and plutonium produced as a result of this process? Does newly adopted «Federal Law No. 190-FZ of 11 July 2011 on the Management of Radioactive Waste and on Amendment of Certain Legislative Acts of the Russian Federation» contain any provisions on this subject?		
Answer	The importation of SNF from foreign states to the Russian Federation for temporary controlled storage and (or) recycling is carried out in accordance with the procedure established by the legislation of the Russian Federation and international agreement the Russian Federation is a party to. The procedure of importation to the Russian Federation of spent fuel assemblies (SFAs) of nuclear reactors as well as return of these SFAs or their recycling products (including radwaste) to the supplier state is regulated by the resolution of the Government of the Russian Federation No. 418 of 11.07.2003 «The procedure of importation to the Russian Federation of irradiated fuel assemblies of nuclear reactors.» The question relates to the Joint Convention.		
Q.No 70	Country Ukraine	Article Article 7.1	Ref. in National Report para 7.3 page 30
Question/ Comment	It is stated that review of safety justifications of nuclear facilities belongs to activities that require license. What basic requirements are established for obtaining a license for review and what is the period of validity of such a license?		
Answer	<p>Since in pursuance of the RF Government Decree dd. 21.11.2011 No. 957 «On organization of certain types of activities licensing», Rostekhnadzor performs licensing of activities when implementing the use of atomic energy including review of design, construction, process documentation and documents that substantiates nuclear and radiation safety ensuring of nuclear installations, radiation sources, storage facilities of nuclear materials and radioactive substances, RW storage facilities.</p> <p>The licensing procedure is described hereinafter:</p> <p>On the date of application documents reception, Division on state services rendering of Rostekhnadzor provide them to Division on licensing activity to check the correspondence of application and its attached documents with the requirements established by Federal law «On licensing of certain types of activities» and Provision on licensing of industrial safety review. The Provision stipulates specific requirements to expert qualification and work experience. Unscheduled on-site inspection of the licensees is carried out in case of adequate preparedness of the application documentation.</p> <p>Considering the results of inspections and examination of the licensees' application documents, draft decision on license granting or refusal is made in parallel with preparation of the license form sheet or rejection notification. Decision-making deadline concerning license issue/rejection is 45 calendar days in correspondence to Part 2 of Article 9 of Federal law «On licensing of certain types of activities».</p> <p>License validity period is fixed by reference to results of review of documentation provided.</p>		
Q.No 71	Country United States of America	Article Article 7.1	Ref. in National Report 7.3
Question/ Comment	(1) Please provide an update on your efforts regarding SAMGs guidance.		

(2) Please clarify if Russia is benchmarking or using industry input on developing the SAMGs guidelines.

Answer

1. In 2006 the operating organization wrote a pilot SAMG for NPP unit with VVER-1000 reactor. Special document containing the requirements to SAMG content was developed by Rostekhnadzor.

A pilot revision of SAMGs was written for Balakovo-4 in 2009. At present, SAMGs are written for all NPP units with VVER reactors in operation and under construction.

According to the document «Updated measures for mitigation of beyond design accident consequences at NPPs,» writing of SAMGs for all NPP units with VVER reactors should be completed in December 2014.

A general approach to writing the SAMG and its structure was similar to that applied in writing SAMGs for Westinghouse's PWRs. A SAMG for each VVER unit is written basing on the standard SAMG with the account taken of the unit design features. The SAMGs are written with involvement of design and engineering organizations as well as technical support organizations.

Working SAMGs for NPP units with VVER reactors are written basing on the standard SAMG for NPP units with VVER-1000 reactors and consider features of each specific unit and NPP as a whole.

In 2012 SAMG for Balakovo-4 was written and put into force.

SAMGs for NPP units with RBMKs, BN and EGP-6 will be produced as stand-alone document or as part of Severe Accident Management Guides in 2015-2016.

2. Nuclear industry data are used to write SAMGs.

Q.No 72	Country Belarus	Article Article 7.2.1	Ref. in National Report info for Article 7
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Question/ When carrying out work on the harmonization of the Russian regulatory framework with
Comment IAEA documents, how were the requirements of the IAEA GSR Part 3 taken into account (or planned to be taken into account)? Do you plan to implement the IAEA GSG-2 criteria in the regulatory framework of the Russian Federation?

Answer

One of recommendations the IAEA experts gave to the Russian Federation after the IRRS post-mission in November 2013 was to update requirements for emergency preparedness and response to harmonize them with the IAEA requirements.

In particular, the Russian side acknowledged that the criteria for declaring «Alarm» and «Emergency» at NPP established in the regulatory document NP-005-98 «Regulation on the Declaring of Emergency, on Early Notification and on Organization of Urgent Assistance to Nuclear Plants in the Event of Radiation Hazards» were not in line with the current approach to defining emergency response criteria reflected, in particular, in the IAEA's document «Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency.» Therefore, following the results of the post-mission, Russia plans to harmonize the federal standards and rules in the field of the use of atomic energy, which establish requirements for the emergency preparedness and response in case of accidents at NPPs, with recommendations of the IAEA's documents, GSG-2 in particular.

Q.No 73	Country United Kingdom	Article Article 7.2.1	Ref. in National Report 7.3
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Question/ §7.3 states «in 2012 an article-by-article comparison of the Russian regulatory
Comment requirements with provisions of the IAEA's safety standards ... was carried out». What was the outcome of this review? Please provide details of any significant shortfalls in the Russian legislation that were identified by this review and how they will be addressed.

Answer

1) Such comparison of requirements of OPB-88/77 with the IAEA standards SSR-2/1 and SSR-2/2 was carried out and its outcomes are given in the book

«Safety of nuclear power plants as per federal standards and regulations and as per the IAEA standards (Comparison of main safety principles and requirements), (In Russian, 195 pp., Moscow, 2012 published by SEC NRS)».

The following conclusion was drawn out basing on the comparison results: the comparison of the Russian RDs with the IAEA standards SSR-2/1 and SSR-2/2, which establish NPP safety requirements for design and operation, has demonstrated, as the previous comparison, that the Russian NPP safety requirements basically correspond to that of the IAEA standards. At the same time, areas were identified where the Russian RDs have to be refined in future to improve harmonization with the IAEA standards. There are a total of 26 such instances. Of them, 16 are concluded as «Should be considered» and 10 are concluded as «Reasonable to take in consideration.» Herein below some example of such conclusions:

The conclusion «should be considered»

1. Application of defense in depth (SSR-2/1, Requirement 7, paras. 4.9 – 4.13)

The issue of excluding so-called cliff edge effect from the design should be addressed, i.e. for minor deviations of parameters describing operation of the NPP not to lead to a stepwise and substantial unfavorable change in its condition.

2. Interfaces of safety with security and safeguards (SSR-2/1 [6], Requirement 8).

The issue of an integrated approach to development and implementation of measure to ensure safety, nuclear security measures and measures of the national system of nuclear material control and accounting should be addressed.

The conclusion «reasonable to take in consideration»

1. Common cause failures (SSR-2/1, Requirement 24).

The OPB requirement to protect systems and components against common cause failures should be added with a reference to specific measures, such as principles of diversity, redundancy and independence.

2. Deterministic approach (SSR-2/1, Requirement 42, para 5.75).

To introduce the notion of the deterministic approach in OPB.

Results of this comparison and conclusions drawn out are taken into account in updating of regulatory document OPB-88/97 currently under way.

2) In the Russian practices the recommendations like those contained in the standard GSR Part 1 and related to the governmental, legislative and regulatory infrastructure of safety are reflected in statutory legal acts and normally are taken account of in drafting and revising thereof. Recommendations of GSR Part I were taken into account in the latest updating of the Federal law No. 170-FZ.

Q.No	Country	Article	Ref. in National Report
74	Korea, Republic of	Article 7.2.4	37
Question/	It is stated, in second paragraph in Page 37, that Article-by-article comparison of the Russian regulatory requirements with provisions of the IAEA's safety standards was carried out.		
Comment	<p>1) Could you provide some comparison results of the SSR-2/1 and 2/2? What were the major items which were not included in the existing Russian regulatory requirements? Is there any plan to reflect those items to your requirements?</p> <p>2) There are many IAEA standards other than SSR-2/1 and 2/2 in the level of the «Safety Requirements» such as GSR part 1, SSR-5 and SSR-6. Is there any plan to do a comparison work for those standards?</p>		
Answer	Such comparison of requirements of OPB-88/77 with the IAEA standards SSR-2/1 and SSR-2/2 was carried out and its outcomes are given in the book «Safety of nuclear power plants as per federal standards and regulations and as per the IAEA standards (Comparison		

of main safety principles and requirements),
(In Russian, 195 pp., Moscow, 2012 published by SEC NRS)».

The following conclusion was drawn out basing on the comparison results: «The comparison of the Russian RDs with the IAEA standards SSR-2/1 and SSR-2/2, which establish NPP safety requirements for design and operation, has demonstrated, as the previous comparison, that the Russian NPP safety requirements basically correspond to that of the IAEA standards. At the same time, areas were identified where the Russian RDs have to be refined in future to improve harmonization with the IAEA standards. There are a total of 26 such instances. Of them, 16 are concluded as «Should be considered» and 10 are concluded as «Reasonable to take in consideration.» Herein below some example of such conclusions:

The conclusion «should be considered»

1. Application of defense in depth (SSR-2/1, Requirement 7, paras. 4.9 – 4.13)

The issue of excluding so-called cliff edge effect from the design should be addressed, i.e. for minor deviations of parameters describing operation of the NPP not to lead to a stepwise and substantial unfavorable change in its condition.

2. Interfaces of safety with security and safeguards (SSR-2/1 [6], Requirement 8).

The issue of an integrated approach to development and implementation of measure to ensure safety, nuclear security measures and measures of the national system of nuclear material control and accounting should be addressed.

The conclusion «reasonable to take in consideration»

1. Common cause failures (SSR-2/1, Requirement 24).

The OPB requirement to protect systems and components against common cause failures should be added with a reference to specific measures, such as principles of diversity, redundancy and independence.

2. Deterministic approach (SSR-2/1, Requirement 42, para 5.75).

To introduce the notion of the deterministic approach in OPB.

Results of this comparison and conclusions drawn out are taken into account in updating of regulatory document OPB-88/97 currently under way.

2) In the Russian practices the recommendations like those contained in the standard GSR Part 1 and related to the governmental, legislative and regulatory infrastructure of safety are reflected in statutory legal acts and normally are taken account of in drafting and revising thereof. Recommendations of GSR Part I were taken into account in the latest updating of the Federal law No. 170-FZ.

Standards SSR-5 and SSR-6, which relate to disposal of radioactive waste and transportation of radioactive substances, respectively, will be used in the course of the planned harmonization of the Russian standards and regulations with the IAEA documents, which is currently under way.

Q.No	Country	Article	Ref. in National Report
75	Austria	Article 8.1	8.1, p39
Question/ Comment	Since 2004 the nuclear regulatory body of the Russian Federation is a part of a wider regulatory body, which is quite unique. What are the experiences gained and lessons learned during this time?		
Answer	When Rostekhnadzor was re-subordinated to the Ministry of Natural Resources and Environment of Russia (Minprirody) in 2008, the ministry was responsible for the police in the field of regulation and performance of the statutory regulation, while Rostekhnadzor, as a Minprirody's agency was responsible mainly for licensing and supervision over safety. The main lesson learned over that period is that for the state safety regulatory authority in the field of the use of atomic energy to exercise its functions efficiently, it must be genuinely independent and must not be part of any ministry, other authorities etc.		

Ultimately, the resolution of the Government of the Russian Federation No. 717 of 13.09.2010 re-subordinated Rostekhnadzor directly to the Government of the Russian Federation again.

Q.No 76	Country Austria	Article Article 8.1	Ref. in National Report 8.2, p42-43
Question/ Comment	What is the role of the Chairman of Rostekhnadzor and what is the role of the Deputy Chairman for nuclear and radiation safety in the regulatory process? Under which circumstances, and under whose authority, can the Chairman and the Deputy Chairman for nuclear and radiation safety be substracted from their positions?		
Answer	<p>The Federal Environmental, Industrial and Nuclear Supervision Service is headed by the Chairman appointed to and dismissed from this position by the Government of the Russian Federation.</p> <p>Within the assigned authority, the Chairman of Rostekhnadzor bears personal responsibility for performance of functions assigned to the agency as a federal executive body, functions associated with development and implementation of the state policy and statutory regulation in the field of its activity as well as (including) in the field of nuclear supervision, functions of control and supervision in the field safety of the uses of atomic energy. The Chairman of Rostekhnadzor represents the Service in relations with other state authorities, citizens and organizations' on behalf of Rostekhnadzor, signs agreements and other civil documents; and exercises other authorities as established by the legislation of the Russian Federation.</p> <p>Deputy Chairmen are appointed to and dismissed from their positions by the Government of the Russian Federation, basing on proposals introduced by the Chairman of the Service. The Chairman of the Service allocates duties among the deputies, appoints to and dismisses from positions the employees of the Headquarters of the Service, heads and deputy heads of the territorial offices of the Service, and heads of subordinate organizations.</p> <p>Deputy chairmen represent Rostekhnadzor as regards separate aspects of the Service's activities; perform certain managerial functions, organize and coordinate performance of Rostekhnadzor's functions in accordance with the order that allocates duties among deputy chairmen and with other Rostekhnadzor's directives and directives of the Rostekhnadzor Chairman.</p>		
Q.No 77	Country Austria	Article Article 8.1	Ref. in National Report 8.1, p39
Question/ Comment	Could you please share with us the system for initial training of the staff of Rostekhnadzor (in nuclear field)? How is the qualification of the personnel maintained and re-examined? Is there a qualification procedure and how it looks like?		
Answer	<p>Rostekhnadzor, including Rostekhnadzor's interregional territorial departments for supervision over nuclear and radiation safety, is staffed with personnel of adequate qualification. The requirements to the qualification are stipulated by the Federal Law No. 79-FZ «On the State Civil Service in the Russian Federation» dd. July 27, 2004, by the Decree of the President of the RF No. 1131</p> <p>«On Qualification Requirements to the Length of State Civil Service (other Kinds of State Service) or to the Length of Employment for Occupational Work with regard to Federal State Civil Employees» dd. September 27, 2005 and by other regulatory legal acts.</p> <p>Advanced training of Rostekhnadzor's staff shall be carried out in frames of the current career development system including as follows:</p> <ul style="list-style-type: none"> • advanced professional education programs, advanced training courses; • educational institutions providing the required content and quality of 		

advanced professional education for state employees;

- structural subdivisions of Rostekhnadzor in charge of management over staff career development system.
- IT & software, ensuring functioning of the Unified State Automated Radiation Situation Monitoring System on the territory of the Russian Federation.

Professional retraining, advanced training and on-the-job training shall be carried out within the whole period of personnel civil service.

Personnel certification with the purpose to verify adequacy for the job shall be carried out periodically (once per three years). In order to carry out certification a certification committee is assigned by the legal act of the state body.

Q.No	Country	Article	Ref. in National Report
78	Canada	Article 8.1	Page 57

Question/ Comment Are there standards for qualification of staff, and also assessment and training and upgrade available for the nuclear sector (regulatory and operating organizations)? Is there sufficient operational independence for required verification or audit/assessment functions? Going beyond the operating organization to regulatory oversight, are there sufficiently established independence of regulatory oversight to assess operating organization systems and programs?

Answer The qualification of staff of nuclear facilities is determined in the Uniform Qualification Reference Book of Positions of Heads, Specialists and Servants in its section «Qualification Descriptions of Positions of Employees of Nuclear Power Organizations» (Order of the Ministry of Public Health and Social Development of the Russian Federation No. 977 of 10 December 2009).

19 Russian universities and 6 military colleges, which educate specialists in nuclear physics and technology, are incorporated within the National Research Nuclear University MEPhI.

These educational establishments provide nuclear education as follows:

- Safeguarding and nonproliferation of nuclear material,
- Nuclear reactors and power installations,
- Electronics and automation of physical installations,
- Physics of charged particle beams and acceleration technologies,
- Radiation safety of humans and environment,
- Physics of atomic nucleus and elementary particles,
- Physics of kinetic phenomena,
- Physics of condensed state of materials.

Rosenergoatom conducts periodical knowledge tests to control the level of knowledge required for its employees to perform their duties.

The knowledge check can be initial, before an employee is admitted to independent work, regular and extraordinary.

Also, NPPs have training centers fitted with special classrooms, laboratories and workshops, training simulators and systems.

Q.No	Country	Article	Ref. in National Report
79	Poland	Article 8.1	39-41

Question/ Comment What is the administrative subordination of Rostekhnadzor and to whom its Chairman reports?

Answer According to para 2 of the Provision on the Federal Environmental, Industrial and Nuclear Supervision Service (approved by the ordinance of the Government of the Russian Federation No. 401 of 30 July 2004) the Government of the Russian Federation directs activities of the Federal Environmental, Industrial and Nuclear Supervision Service.

Head RTN obeys Deputy Prime Minister.

Q.No 80	Country Spain	Article Article 8.1	Ref. in National Report 39
Question/ Comment	<p>It is said in page 39 that Rostekhnadzor «brings in to the Russian Federation Government draft federal laws, draft legal acts of the President of Russia and the Government of Russia, and other documents subject to endorsement by the Russian Federation Government».</p> <p>Is there any kind of legal obligation, regarding conclusions and recommendations of any type of Rostekhnadzor reports and documents submitted to the Federal Government?</p>		
Answer	No, in the Russian legislation such liabilities are not fixed.		
Q.No 81	Country Spain	Article Article 8.1	Ref. in National Report 43
Question/ Comment	<p>The Rostekhnadzor organizational structure described in page 43 only makes mention of human resources</p> <p>How is the organization of the three Rostekhnadzor Headquarter Departments dedicated to nuclear installations? Are they orientated to knowledge areas or to types of facilities?</p>		
Answer	<p>To types of facilities:</p> <p>The Department for safety regulation at nuclear power plants and research nuclear installation and the Department for safety regulation of nuclear fuel cycle enterprises, ship nuclear installations, radiation-hazardous facilities, The Department for physical protection, control and accounting of nuclear material, radioactive substances and radioactive waste.</p>		
Q.No 82	Country Spain	Article Article 8.1	Ref. in National Report Page 43 and Appendix 7
Question/ Comment	<p>The organizational structure of Rostekhnadzor Interregional Departments, described in page 43 and Appendix 7, only makes mention of human resources.</p> <p>How much of the human resources shown in Appendix 7 for the Rostekhnadzor Interregional Departments is dedicated to nuclear facilities? Is their organization orientated to knowledge areas or to types of facilities?</p>		
Answer	<p>Historically, interregional territorial departments for nuclear and radiation safety (ITDs NRS) were established as linked to the federal districts of the Russian Federation but considering types of reactor installations.</p> <p>In 2011 two interregional departments were merged into the interregional department for Siberia and Far East (SFE ITD).</p> <p>The Table given in the appendix to this answer shows the data on the number of staff on positions implying supervisory (controlling) functions, ITD NRS and Headquarters of Rostekhnadzor.</p>		
Support Documents	<p>Table - The data on the number of staff on positions implying supervisory (controlling) functions, ITD NRS and Headquarters of Rostekhnadzor (slashed number is the staff who supervises over nuclear power plants)</p>		

ITD staff schedule; positions implying supervisory (controlling) functions , total/NPPs	DITD	VITD	SFE ITD	NEITD	UITD	CITD	HQ	TOTAL
	106/44	140/25	142/6	112/21	89/9	135/5	52/25	776/135

Q.No 83	Country Spain	Article Article 8.1	Ref. in National Report Page 44
Question/ Comment	<p>SEC NRS and VO Safety are mentioned as two scientific and technical organizations that support Rostechnadzor activities. But both institutions have activities that may be also useful for industry personnel. For instance, VO Safety certificates equipment and organizes training courses.</p> <p>Do SEC NRS and VO Safety work exclusively for Rostechnadzor? Are they the only Rostechnadzor consultants or resources from Rosatom institutions are sometimes used?</p>		
Answer	<p>1. Both technical support organizations – SEC NRS and VO Safety – can work not only for Rostechnadzor, as per their charters. For example, as per para 2.4 of the Charter, SEC NRS has the right to do works and render services associated with its main activities to citizens and legal entities at a charge, including under contracts with ROSATOM, in excess of the governmental order. However, Article 2.5 of the Charter states that SEC NRS can carry out other profitable activities in so far as it serves to achieving goals the entity was established for and corresponding to these goals. Thus, SEC NRS and VO Safety can have contracts with other organizations, including ROSATOM, but as regards issues that do not contradict Rostechnadzor's interests.</p> <p>2. Both TSOs are sole consultants of Rostechnadzor. Rostechnadzor doesn't make use of ROSATOM entities' resources.</p>		
Q.No 84	Country Spain	Article Article 8.1	Ref. in National Report xx
Question/ Comment	<p>No information is given about Rostechnadzor participation in working groups and activities of international agencies on nuclear safety.</p> <p>Is Rostechnadzor participating in activities or working groups of nuclear safety international agencies? In particular, is it participating, or planning to do it, in the NEA-CSNI working groups?</p>		
Answer	<p>Yes, it does participate. Representatives of Rostechnadzor participate in the working group for operating experience analysis (NEA WGOE), working group on severe accident analysis (NEA WGRNR), and working group on accident management (NEA TGAM). Representatives of Rostechnadzor are also participate in the IAEA standards committees.</p>		
Q.No 85	Country Spain	Article Article 8.1	Ref. in National Report 69
Question/ Comment	<p>At the end of Section 12.3, it is mentioned that, in the Rostechnadzor annual reports, analyses are presented that take account of human error statistics of the plants, information about the managerial weaknesses, description of poor safety culture examples and causes of errors. It is also said that the reports present analyses of corrective actions, developed by the Operating Organization to prevent human error recurrence, and that proposals for improving competences of managerial, operations and maintenance personnel are produced.</p> <p>Which part of the Rostechnadzor organization develops the analyses of the human and organizational performance described at the end of Section 12.3 and contained in the Rostechnadzor annual reports?</p>		
Answer	<p>Such analyses are carried out by SEC NRS as per the Terms of Reference by the Department of Safety Regulation of Nuclear Power Plants and Research Nuclear Installations of Rostechnadzor. The analyses results are sent to Rostechnadzor for the use in routine activities. Also, such analyses are carried out following Rostechnadzor's</p>		

inspections of nuclear power plant.

Main conclusion of the analyses of nuclear power plant operational events, deficiencies of the organization of nuclear power plant operations are given in Annual Reports of Rostechnadzor. These reports are publicly available on Rostechnadzor's website (Section 2.2.1): http://www.gosnadzor.ru/public/annual_reports/

Q.No 86	Country Switzerland	Article Article 8.1	Ref. in National Report p. 41
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Question/ Rostechnadzor performs its activities employing a quality assurance system that meets the requirements of the «Provision on the Quality Management System of the Federal Environmental, Industrial and Nuclear Supervision Service in the Field of the State Regulation of Safety in the Use of Atomic Energy».

Comment Can these requirements be compared with those of the IAEA GS-R3 and/or ISO9001? What is included in this system?

Answer 1. «Provision on the Quality Management System of the Federal Environmental, Industrial and Nuclear Supervision Service in the Field of the State Regulation of Safety in the Use of Atomic Energy» meets all the main requirements of IAEA GS-R-3 and standards ISO 9001, since this document states the «Policy of Federal service on Environmental, Industrial and Nuclear Supervision Service in the Field of the State Regulation of Safety in the Use of Atomic Energy», distribution of responsibilities and authorities of Rostechnadzor employees when implementation of quality assurance system, safety culture assurance, differential approach to selection of scopes and forms of State regulation of safety in the use of atomic energy depending on a potential hazard and condition of safety at the nuclear facilities, defines the processes of quality management system and interactions among them (including the processes related to recourse control, documentation management, assessment of quality management system effectiveness and its further improvement and others).

2. Quality management system of Rostechnadzor in the field of the State regulation of safety in the use of atomic energy includes:

- organizational structure of Rostechnadzor, responsibilities and authorities of its employees;
- processes, procedures and recourse needed and sufficient for achieving the goals stated by the Policy in the field of quality management of State regulation of safety in the use of atomic energy;
- quality management systems of interregional territorial administrations on nuclear and radiation safety supervision, territorial administrations of Rostechnadzor responsible for State civil supervision when construction and reconstruction of nuclear facilities, as well as quality management systems of lower organizations.

Q.No 87	Country Germany	Article Article 8.2	Ref. in National Report page 44
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Question/ On page 44 the IRRS mission to Rostechnadzor is mentioned briefly. One of the suggestions in the 2011 rapporteurs report was to include in the next National Report the outcomes from the activities undertaken to address the IAEA IRRS mission findings. Could you share some information, please?

Answer Post mission of IRRS was carried out in Russian Federation since 10 through 19 November 2013. Below are the main findings of IAEA experts based on the results of the post mission carrying out:

- Rostechnadzor is the efficient independent safety regulator directly subordinated to RF

government;

- Since 2009 the legal foundation of State regulation of nuclear and radiation safety has been streamlined: important amendments were made to the Federal Law «Atomic Energy Use» №170-ÔÇ and Federal Law «Radwastes handling...» № 190-ÔÇ was adopted;

Interaction of Rostekhnadzor with the Federal executive authorities was brought to a high grade level;

- Positive structural and staff changes occurred to ensure regulatory supervision over the construction of new NPP units; at the same time, however, RF government should pay due attention to ensure that the regulatory body is provided with the necessary human and financial resources;

- Activity on perfection of Rostekhnadzor administration management system was initiated;

- Rostekhnadzor, jointly with foreign regulators, carry out inspections of NPPs and fuel cycle enterprises;

- In Rostekhnadzor the methodology of evaluation of NPP emergency drills effectiveness was developed;

- Rostekhnadzor has the regulatory documents that contain detailed requirements and instructions regarding emergency response plans for all types of nuclear facilities;

- Safety requirements when radioactive materials transportation were harmonized with the actual Revisions of respective IAEA safety norms;

- Rostekhnadzor is recommended to expand the program of evaluation of emergency drills effectiveness to cover facilities other than NPP;

- Actions of Rostekhnadzor taken immediately after accident at Fukushima Daiichi NPP were recognized to be timely and effective;

- Russian Federation facilitates the effective development of measures and programs on enhancement of global safety system after accident at Fukushima Daiichi NPP;

- Russian Federation contributes a lot in the Plan of actions of IAEA on nuclear safety and proposal on updating of international tools for safety enhancement all over the world;

- Stress tests were performed for both operating NPPs and those being constructed and for research reactors. At the same time, Rostekhnadzor is recommended to perform stress tests for main enterprises of fuel cycle.

The Table given in the appendix to this answer shows the findings of post mission IRRS carrying out.

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Table - The findings of post mission IRRS carrying out

	Recommendation	Proposal	Good practice
Findings of Mission 2009	25	34	5
implemented	10	15	
“Closed” based on confidence in achievement	8	7	

Remained open	7	12	
Findings of post mission 2013	3	1	3
Module «Emergency preparedness and response»	2	7	2

Q.No	Country	Article	Ref. in National Report
88	Korea, Republic of	Article 8.2	42
Question/ Comment	<p>According to the Russian National Report to the 5th Review Meeting (2011), the Ministry of Natural Resources and Environment (Minprirody) was in charge of implementing the legal regulation functions while the Federal Environmental, Industrial and Nuclear Supervision Service (Rostekhnadzor), as an agency of Minprirody, was mostly responsible for licensing and findings of safety supervision (Article 8, page 33, Russian National Report to the 5th Review Meeting).</p> <p>However, in this new National Report to the 6th Review Meeting (2014), Rostekhnadzor is considered the sole federal agency responsible for nuclear regulation in the Russian Federation. Please explain the Ordinance of the Government of the Russian Federation No. 1037 of 11 October 2012 «Regarding Amendments to the Statute of the Federal Environmental, Industrial and Nuclear Supervision Service» in more details concerning the following issues:</p> <ul style="list-style-type: none"> - What is the current position of Rostekhnadzor in the organizational structure of the Russian Government? - What are the major points in the transfer of legal and regulatory responsibilities from Minprirody to Rostekhnadzor? - What is the current status of the Minprirody's Department of State Policy and Regulation of Industrial and Nuclear Safety? - What are the current relation between Rostekhnadzor and the two agencies of Minprirody, the Rosprirodnadzor and Rosgidromet, regarding the environmental oversight and monitoring? 		
Answer	<p>In pursuance of the Ordinance of the President of Russian Federation dated June 23, 2010 No 780 «Issues of Federal Environmental, Industrial and Nuclear Supervision Service», the Ordinance of the Government of the Russian Federation of 13.09.2010 № 717 stated that the management of activity of Federal Environmental, Industrial and Nuclear Supervision Service shall be performed by the Russian Federation government. Thus, Rostekhnadzor was removed from the staff of the Ministry of Natural Resources and Environment (Minprirody) of Russian Federation and was re-subordinated directly to the government of Russian Federation. Currently, Rostekhnadzor is an integral part of Federal services and agencies that are directly subordinated to the Russian Federation government. Via the Ordinance of the President of Russian Federation dated June 23, 2010. No 780 «Issues of Federal Environmental, Industrial and Nuclear Supervision Service» the functions related to development and implementation of the State policy and Legal</p>		

regulation in the area of industrial and nuclear supervision were entrusted on the Federal Environmental, Industrial and Nuclear Supervision Service; in this connection, the Department of the State policy and Industrial and Nuclear safety regulation of Natural Resources and Environment (Minprirody) was abolished. Via the same Ordinance the functions of Rostekhnadzor in the area of environmental protection, regarding restriction of negative technological impact in the area of wastes handling and State environmental expertise were transferred to Rosprirodnadzor.

According to the Ordinance of the Government of the Russian Federation of May 29, 2008 № 404 Rosgidromet is a Federal executive body to render the State services in the area of hydrometeorology and related areas, environmental monitoring, environmental pollution, State supervision over performance of work related to active impact on meteorological and other geophysical processes.

Q.No 89	Country Korea, Republic of	Article Article 8.2	Ref. in National Report 42
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Question/ What is the total number of staff of Rostekhnadzor, including Headquarters and regional
Comment bodies? Is there any technical support organization within Rostekhnadzor? If not, does Rostekhnadzor have plan to establish such in-house TSO?

Answer RTH works just over 9 thousand people in all activities, in the field of atomic energy - about 1,900 people, including headquarters around 120 people., SEC NRS - 350 people., VO «SAFETY» - 700 people.
Rostekhnadzor has two technical support organizations: «Scientific and Engineering Centre for Nuclear and Radiation Safety» («SEC NRS») and Federal State-Owned Unitary Enterprise (VO «SAFETY»).

Q.No 90	Country Korea, Republic of	Article Article 8.2	Ref. in National Report 46
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Question/ According to the National Report, the «Scientific and Engineering Centre for Nuclear and
Comment Radiation Safety» (SEC NRS) and the Federal State-Owned Unitary Enterprise «VO Safety» are the two principal TSOs of Rostekhnadzor.
- Since SEC NRS is a federal budgetary institution while VO Safety is a federal state-owned unitary enterprise, what is the relationship between Rostekhnadzor and these TSOs (i.e. jurisdictional/organizational/contractual)?
- If SEC NRS and VO Safety are organizationally independent from Rostekhnadzor, do they have any contract or cooperative activity with nuclear promotion organizations like ROSATOM? And if there is such activity/contract, does Rostekhnadzor have any mechanism to avoid any conflict-of-interest in the technical support provided by SEC NRS and VO Safety?

Answer In Russian Federation the concept «organization of scientific technical support of regulatory body» was legislated. Thus, in Para 10 of Article 26 of Federal Law «Nuclear energy use» of November 21, 1995 № 170-ÔÇ Rev. it is stated that «...expertise of nuclear facilities included into the list indicated in Para 13 of Article 24.1 of this Federal Law, and (or) types of activities in the area of nuclear energy use implemented by Operators at these facilities or in relation to these facilities shall be performed by scientific technical support organizations of the authorized agency of State safety regulation». The goals of activity of scientific technical support organizations of regulatory body are indicated in Article 37.1 of the above Law:
- scientific and technical support of State safety regulation when use of nuclear energy, including development and coordination of scientific-research and experimental-design works and conduct of expertise, including safety expertise;
- development and updating of regulatory base in the area of nuclear energy use, other

activity addressed at improvement of State safety regulation when nuclear energy use. Based on Rostekhnadzor Order of October 28, 2010 FBI «SEC NRS» is included into the list of budgetary institutions subordinated to Rostekhnadzor. FBI «SEC NRS» implements its activity based on RF legislation, regulatory legal acts, administrative documents of Rostekhnadzor, as well as Statute of FBI «SEC NRS» approved through Order of Rostekhnadzor of December 31, 2010 № 1184.

According to i. 2.4 of the Statute, FBI «SEC NRS» has the right to perform the work and render services, beyond the set up State assignment, related to its main type of activities for the citizens and legal bodies based on onerous base including those under the contracts with State Corporation «Rosatom». However, it is stated in Article 2.5 of the Statute that FBI «SEC NRS» can perform another commercial activity insofar as this activity only contributes to achievement of the goals for which it was established and if this activity is congruent with these goals. Hence, FBI «SEC NRS» can have contractual relationships with other organizations, State Corporation «Rosatom» included, but merely within the scope of issues that are not in conflict with the interests of Rostekhnadzor.

To avoid the conflict of interests the organizational structure of Rostekhnadzor stipulates an ad hoc commission for observance of requirements to the official behavior of Federal State employees and settlement of conflict-of-interests.

Q.No	Country	Article	Ref. in National Report
91	Korea, Republic of	Article 8.2	46

Question/ The activities of the SEC NRS was described on page 46.
Comment Does the SEC NRS conduct international cooperation activities with TSOs outside the Europe? If any, please inform us of the current status of bilateral MOUs with the cooperating TSOs.
Please provide the information on the human resource, budget and organization of the SEC NRS

Answer International cooperation with STSOs outside the Europe
FBI «SEC NRS» performs its main international cooperation with the scientific technical support organizations (STSO) in the European region and with the countries of Commonwealth of Independent States.
At the same time, the bilateral cooperation with the US national laboratories is carried out related to the physical protection issues. Thus, for instance, the activities related to accounting and control and physical protection of nuclear materials are carried out between Pacific north-west branch of Battel memorial institute and FBI «SEC NRS» within the frames of Foundational Agreement 334235-A-Ê5.
Moreover, cooperation with STSO of Japan (JNES) was arranged within the frames of activity of Association of European organizations of scientific-technical support (ETSON), whereto FBI «SEC NRS» and JNES are included as associated members, i.e. organizations of countries outside the zone of European Union, but which have the right to actively participate in the work of Association and its work groups addressing the exchange of STSO experience and practice in the area of rendering the scientific and technical support to the regulatory body of nuclear and radiation safety.
Vietnam is another example of cooperation of FBI «SEC NRS» in the Asian region. In view of the fact that STSO formation activity has not been completed in Vietnam for today, FBI «SEC NRS», under a commission of Rostekhnadzor, implements the interaction with the regulatory body of Vietnam (VARANS) in the personnel training and preparation VARANS, as well as in development of a number of legal documents.
Besides, under a commission of Rostekhnadzor, FBI «SEC NRS» intends from now on to expand the cooperation area with STSOs of non-European region.
Budget and human resources, organizational structure

The budget of FBI «SEC NRS» is formed from subsidies from the State budget, State Assignment performed on account of Federal budget resources and performance of work within the frames of:

- Safety assessment;
- Federal target programs;
- Contracts on performance of scientific and research, experimental design and technological works.

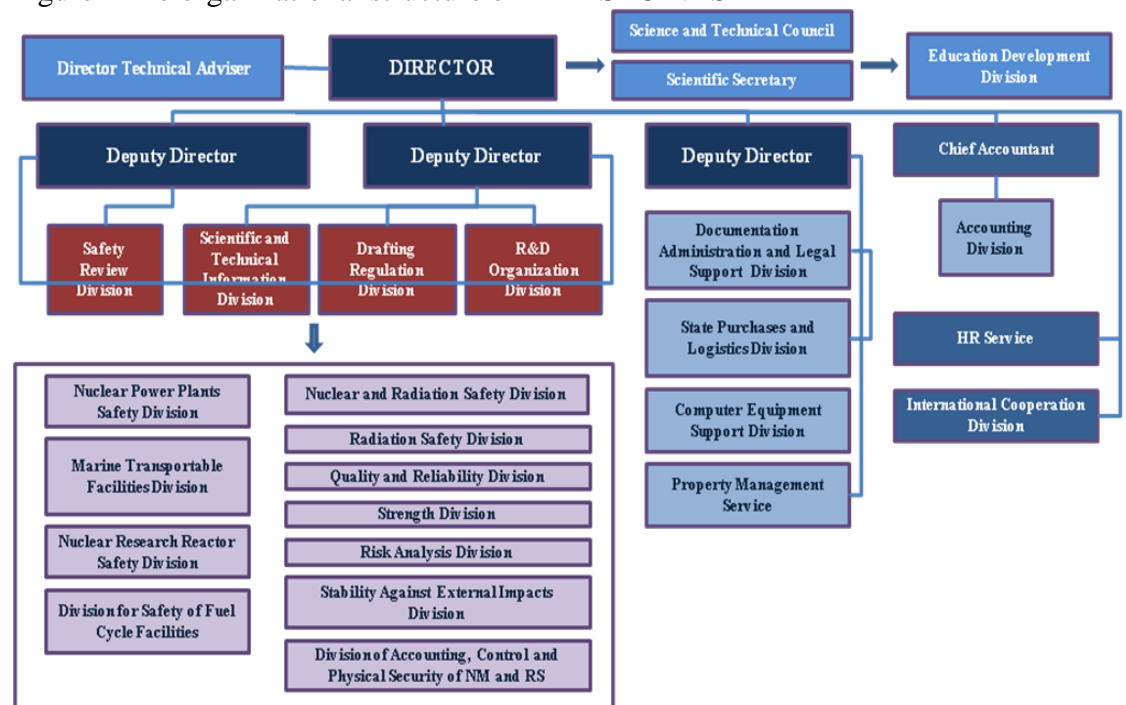
In 2013 the budget of FBI «SEC NRS» amounted to about 13 mln Euro.

The number of staff is 350 people, out of which there are 44 Doctors of Science and aspirants.

The Figure given in the appendix to this answer shows the organizational structure of FBI «SEC NRS».

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Figure - The organizational structure of FBI «SEC NRS»



Q.No 92	Country Poland	Article Article 8.2	Ref. in National Report p. 43
Question/ Comment	What the Department for Special Safety deals with?		
Answer	<p>Via Order of Rostekhnadzor № 163 of 18.04.2013 the «Provision on special safety administration body» was approved. According to this Provision the below refers to the sphere of activity of this administration body:</p> <ul style="list-style-type: none"> - performance of State regulation of physical protection of nuclear materials, nuclear facilities and storage facilities of nuclear materials; - organization and implementation of State supervision over accounting and monitoring of nuclear materials, radioactive substances and radioactive wastes; - organization and implementation of State supervision over physical protection of radiation sources, radioactive substances and storage facilities of radioactive substances and radioactive wastes; - organization and participation in implementation of supervision over the state of protection of nuclear facilities, radiation sources, storage facilities of nuclear materials and 		

radioactive substances against terrorist attacks, over the systems of the unified State accounting and monitoring of nuclear materials, radioactive substances and radioactive wastes;

- participation in organization of monitoring of anti-terrorist protection of the most dangerous important industrial facilities and hydraulic engineering structures (other than navigational hydraulic engineering structures);
- information and analytical assurance of monitoring of the state of the facilities to be monitored and monitoring of nuclear power facilities when emergencies, operation of monitoring subsystems of chemically hazardous and explosive facilities, as well as nuclear and radiation hazardous facilities as part of the unified State system of emergency warning and mitigation.

Q.No 93	Country Turkey	Article Article 8.2	Ref. in National Report 46
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Question/ Comment It is understood from the report that both VO Safety and SEC NRS has been utilized for the preparation of regulations and standards by Rostekhnadzor. Is there a formal separation of responsibilities between these two TSOs? How is it decided which organization will be used for the preparation of which regulatory document? How these two organizations share the knowledge base for the preparation of these documents?

Answer FSUE VO «Safety» implements the main directions of assessing and supervisory activities during design, construction engineering, manufacturing, supplies and installation of products, pre-operational tests and operation of the main equipment of the plant. The following are the directions: design and construction engineering documentation, quality during construction engineering and manufacturing of products, acceptance inspections of the products, monitoring and analysis of product quality, supervision over the quality during installation and commissioning, certification and quality management system.

FBI «SEC NRS» was established to obtain and use the new scientific knowledge for scientific and technical support of nuclear and radiation safety, including analysis and justification of criteria and requirements of nuclear and radiation safety when use of nuclear energy for peaceful and defense purposes. Performance of applied scientific and research, design experimental and technological works addressing the scientific and technical support of nuclear and radiation safety regulation is the subject of FBI «SEC NRS» activity stipulated in the Statute.

The basic types of FBI «SEC NRS» activity are the applied scientific researches and developments including those in the below areas:

- regulation of nuclear and radiation safety, physical protection of nuclear facilities, including nuclear facilities, radiation sources and storage facilities of nuclear materials and radioactive substances;
- accounting and control of nuclear materials and radioactive substances;
- safety assurance at the nuclear-related facilities.

Each of these two SEC units deals with development of legal documents for Rostekhnadzor in their own directions of activity, they work in close cooperation, jointly take part in the work of the work groups for development of regulatory documents.

Q.No 94	Country Belarus	Article Article 9	Ref. in National Report info for Article 9
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Question/ Comment On which units of the Russian Federation are works to increase reserve power performed?

Answer Works to increase reserve power of the reactor plants are performed at 11 power units of

PWR-1000, including the below:

-activities completed and Balakovo NPP units 2 and 4 are at the stage of commercial operation;

-7 power units (№ 1, 3 of Balakovo NPP, № 1, 2, 3 of Kalinin NPP, № 1, 2 of Rostov NPP) are at the stage of trial operation;

-measures for preparation of power unit № 4 of Kalinin NPP for operation at higher power rate (Nt=104 % Ntrated) are performed at Kalinin NPP.

Q.No 95	Country Pakistan	Article Article 9	Ref. in National Report General
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Question/
Comment Russian Federation may please share mechanism adopted by license holder for maintaining open and transparent communication with public.

Answer Public relations and work with mass medium in Rosenergoatom are coordinated by the Department of information and public relations, which is guided by the approved Policy of external and internal communications.
Structural units were established at all NPPs – Administration offices for information and public relations.
The basic functions of these units – administering of mass and internal communications, as well as interaction with the bodies of the State power, local communities and social organizations.
For fulfillment of these functions the Public information centers have been successfully working for many years in the NPP related towns, 7 information centers of nuclear branch have been opened since 2011 in the NPP related regional centers (total in Russia – 18 similar centers, including those in the regions of perspective construction of NPPs – Kaliningrad, Nizhniy Novgorod, Vladimir).

Main concepts of Concern for public relations:

Principle of regularity: The Concern, on the regular base, uncovers the information about the most significant events and facts of the Concern activity that touch the interests of the employees of Concern and the public using the information means accessible for public.

Principle of operability: Concern ensures openness, timeliness, trustworthiness and easy access to information about its activity within the maximum shortest time to avoid the loss of relevancy of the information to be uncovered.

Principle of completeness: Concern submits the trustworthy information to enable the employees of Concern and the public to have objective and most complete knowledge of activity of nuclear facilities.

Principle of trustworthiness: Concern submits the information consistent with the real situation to its employees and the public; it also takes all measures so that the information disseminated would not be distorted or erroneous.

Principle of consistency: Concern ensures consistency and conformity of information uncovered by Concern.

Principle of objectiveness: Concern does not avoid uncovering negative information about itself and its activity, if it is substantial for the employees of Concern or the public.

Principle of availability: Concern uses such methods of information dissemination that will provide its employees and the public with free, easy and the cheapest access to the information uncovered.

Example of implementation of main principles is a public annual report issued by Rosenergoatom, as well as public annual environmental reports of all NPPs which presentation is carried out and representatives of authorities, business, public and environmental organizations are invited. These reports are available on the site of Concern.

The below forms of work are used by Concern for public relations:

- regular meetings with journalists, press tours, press clubs, briefings, answers to written enquires;
- release of corporate newspapers and magazines to be disseminated among the employees of NPP and citizens of «atomic» towns;
- continuous maintaining of Internet-Web site of Concern and blog of Concern Director General where everyone can ask a question and receive a response;
- tours for target groups to nuclear power plants and public information centers, where the ad hoc exhibitions are available;
- various measures for schoolchildren: open attended lessons and lectures, quizzes, competitions and contests;
- round tables, discussions, meetings for various groups of public;
- ad hoc popular books, brochures, booklets about nuclear power plants activity;
- grant support of socially oriented projects in nuclear related towns;
- etc.

Q.No 96	Country Canada	Article Article 10	Ref. in National Report Page 53, 10.2
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Question/ Comment From the report it appears that much has been implemented to build safety culture awareness. Is there a legal or regulatory instrument (eg a guide) for this implementation?

Answer Requirement of the need to form safety culture of the personnel was established by the Federal rules and regulations in the document NP-001-97 (PNAE G-01-011-97) «General provisions for safety assurance at nuclear power plants (OPB-88/97)»

The below documents that regulate the process of safety culture formation and enhancement were developed in Rosenergoatom:

- Provision on the procedure of safety culture monitoring at nuclear power plants;
- Methodology of safety culture self-assessment at nuclear power plants;
- Methodological recommendations for performance of safety culture self-assessment at nuclear power plants;
- Provision on safety culture group at nuclear power plants;
- Provision on concluding day of safety culture;
- Self-assessment of operation safety of nuclear power plants. Methodological guide.

Q.No 97	Country Korea, Republic of	Article Article 10	Ref. in National Report 3, 55-56
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Question/ Comment According to the National Report, the nuclear operator Rosenergoatom has implemented a number of measures to develop and maintain a strong safety culture. Does Rostechndzor have similar policies and/or plans to develop and maintain its own safety culture, and to assess and supervise the safety culture of the nuclear operator?

Answer 1. Need to support the own safety culture in Rostechndzor was set forth in «Provision on the Quality Management System of the Federal Environmental, Industrial and Nuclear Supervision Service in the Field of the State Regulation of Safety in the Use of Atomic Energy». This document, in particular, states that one of the tasks related to quality management system implementation is to ensure the common understanding of key aspects of safety culture in the system of Rostechndzor.
Besides, the issues related to formation and maintaining of safety culture for the employees of Rostechndzor are considered when their professional training and qualification.

2. Assessment and supervision over safety culture by the nuclear operator are implemented when performance by Rostechndzor of license activity and Federal State supervision in

the area of nuclear energy use (including those performed during inspections (audits) of the nuclear operator and its subsidiaries, during expert assessment of NPP safety analysis reports, quality assurance programs and others).

Q.No 98	Country Lithuania	Article Article 10	Ref. in National Report Page 53
Question/ Comment	It is stated: «Rostechnadzor ensures nuclear and radiation safety in frames of respective responsibility set out in the legislation of the Russian Federation through: [...] building up committed attitudes to the principles of the safety culture of the plant personnel and staff of organizations, which execute works and render services to the Operating Organization.» Could you please provide information regarding methods Rostechnadzor are using to build up a committed attitude to the principles of the safety culture for the personnel of contractors and subcontractors (execute works, render services)?		
Answer	<p>Requirements of Federal Regulations (NP-090-11 «Requirements for quality assurance programs for nuclear facilities») provides for the development of quality assurance programs of private organizations performing activities affecting the safety of nuclear facilities, on a separate stage of life nuclear facilities and/or implementation licensed activity in the field of nuclear energy.</p> <p>In these private programs describing the procedures affecting the human factors , on the selection , acquisition, training, maintaining and improving staff employed at all stages of the life cycle of a nuclear facility , developing and sustaining a culture of safety organizations , to identify and analyze the causes of the nonconformities (taking into account the impact on the safety of nuclear facilities inconsistencies), development, implementation , monitoring implementation of corrective and preventive actions , analyze their performance.</p> <p>Given the importance of the human factor in the activities of the staff of contractors for nuclear facilities safety attaches great importance to a culture of safety among the employees of these organizations.</p> <p>For operating experience (including related to the human factor) when designing or making further modifications to the projects of nuclear installations in the State Corporation «Rosatom» developed and put into action «Regulations on the operating experience to develop and maintain the project and working (design) documentation of nuclear power plants», which determines the order of accumulation and use of operating experience to ensure the timely implementation of corrective measures to ensure the quality of new projects and modifications.</p>		
Q.No 99	Country United Kingdom	Article Article 10	Ref. in National Report 10.1
Question/ Comment	For Rosenergoatom, §10.1 summarises the legal requirements and the principles for ensuring safety. How has Rosenergoatom ensured that these principles have been implemented across all of its sites and at all levels throughout the organisation?		
Answer	<p>These principles are realized through :</p> <ul style="list-style-type: none"> - implementation of unified scientific-technical and economic policies to meet priority security; - continued investment in safety improvement project properties of nuclear safety ; - the dissemination of best practices; - constant analysis of operational processes , studying the changes of material science , hydrodynamic, neutron-physical characteristics and properties of nuclear facilities and nuclear power plants as a whole during the operation; - develop and implement measures to prevent accidents at nuclear power plants ; - improving preparedness management and staff of the operating organization and the 		

power plant staff to emergency response;

- ensuring and maintaining the necessary qualifications and competence of the staff;
commitment to education NPP workers and staff organizations operating and providing services to the operating organization, safety culture principles.

Q.No 100	Country United States of America	Article Article 10	Ref. in National Report 10.2
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Question/ Comment Industry guidance on safety culture was recently issued by WANO in May 2013 (PL 2013-1). Has this guidance been evaluated and considered in your assessment of safety culture?

Answer Measures for safety culture enhancement were developed in Rosenergoatom for 2014-2015, these measures stipulate conduct of review of safety culture documents in force, their updating and issuance, if required, of new documents. Updating will be performed taking into account the documents of IAEA and WANO issued in the recent years, industry guidance on safety culture included (PL 2013-1).

Q.No 101	Country Austria	Article Article 11.1	Ref. in National Report 11.1, p57-58
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Question/ Comment It is stated «the reserve intended for financing of expenditures to decommission the plant ... in an amount of not greater than 3.2 % of revenues gained by Rosenergoatom through sales» and «the reserve intended for financing of expenditures to dispose of radioactive waste ... in an amount of not greater than 1.5 % of revenues gained by Rosenergoatom through sales».

Could you please share with us the present assessment for the decommissioning costs of existing power reactors and for the management of radioactive waste? What is the projected status of nuclear sites after decommissioning? Do you think the mechanism of financial provisions is adequate? Could you please indicate a comparison with data from other countries?

Answer Indices and characteristics of the final state of the power unit of NPP after its decommissioning shall ensure the possibility of its release from the supervision of the supervisory bodies of the State regulation of Russian Federation in the part of radiation safety (transfer of nuclear hazardous power unit shutdown for decommissioning into the state «radiation free facility» and bringing of NPP site to the state, that will enable further unlimited use of buildings, systems, structures, equipment and territory of site for industrial purposes). Selection of a specific variant of use of buildings, systems, structures, equipment and territory of NPP site after release from the supervision of the supervisory bodies of the State regulation is determined at the final stage of the unit decommissioning. Decommissioning expenditures and handling expenditures of the spent fuel available at the unit after its final shutdown and radwastes produced when NPP decommissioning are financed on account of «Reserve for decommissioning» formed in the amount of 3,2 % of the revenues gained by Rosenergoatom after product sale.
Expenditures for radwastes burial are financed on account of «Reserve for ensuring radwastes burial» formed in the amount of 1,5 % of the revenues gained by Rosenergoatom after product sale.
Scope of financial provisions (in accordance with the calculations made) is sufficient and existing financial mechanisms are adequate.

Q.No 102	Country Euratom	Article Article 11.1	Ref. in National Report page 57
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Question/ Comment The reserve intended for financing of expenditures for ensuring nuclear, radiation, industrial and fire safety during operation of NPPs basing on the program of measures, in

an amount of not greater than 10% of revenues gained by Rosenergoatom through sales of products.

The available financial resources for safety upgrades are defined by government decree. Please explain how the nuclear operator can be made responsible for operation if he has not the power to decide for financing necessary safety upgrades / improvements.

Answer Based on the Resolution of the Russian Federation government dated 30.01.2002 № 68, the normative of financial allocations to the reserve intended for financing nuclear, radiation, industrial and fire safety at nuclear power plants (hereinafter – NRI&FS) was set forth by State Corporation «Rosatom» (hereinafter – Corporation) in the amount not greater than 10% of revenues gained by Rosenergoatom (hereinafter – Concern) through sales of electric power.

The normative is approved based on the program of measures prepared by Concern to implement the long-term program of activity of the Concern.

Taking into account that the normatives of financial allocations accepted during 2002-2013 to the reserve of NRI&FS do not exceed 4 %, there is an evident availability of significant reserve against the normative volume.

If it becomes necessary to form NRI&FS reserve in a bigger amount than the set forth limit amount of 10 %, the Concern will prepare the proposals for the normative increase that will be sent to the Corporation to arrange the work on making necessary amendments to the Resolution of the Russian Federation government dated 30.01.2002 № 68.

Earlier the alike modifications of the normatives were initiated by the Concern and sent to the Corporation. Thus, in accordance with Resolution of the Russian Federation government dated 19.11.2012 № 1189 the normatives of financial allocations to the reserves intended for physical protection at nuclear power plants were increased from 1 % to 2 % and for power units decommissioning from 1,3 % to 3,2 %.

Q.No	Country	Article	Ref. in National Report
103	Japan	Article 11.1	p57

Question/ Comment The National Report (page57) says Reserve for ensuring nuclear, radiation, industrial and fire safety was additionally increased by 10 % ----- Fukushima Daiichi NPP.

Also in page 52, it explains civil liability obligation incurring irrespectively of whether the Operating Organization is guilty or not

1. How much Rubles are reserved?
2. Are the reserve secured by any outside organization of the NPP operator or by some type of liability insurance?
3. For what are the reserve used to?

Is there any written document that explains about the range of coverage by the reserve?

4. For example, are 1) liability to the property in the NPP site, and
- 2) the cost for offsite decontamination should catastrophic accident occurred covered by the reserve?

Answer

1. The scope of the «Reserve for ensuring nuclear, radiation, industrial and fire safety» for 2014 amounts to 8,0 bln Rubles.
2. The reserve is secured by the higher organization - State Corporation «Rosatom».
3. Based on the financial means for every calendar year allocated from the reserve for financing the expenditures for ensuring nuclear, radiation, industrial and fire safety, the Operator organizes development of annual detailed «Program of measures to ensure nuclear, radiation, industrial and fire safety during operation of nuclear power plants for the current year» to enhance safety at all 10 Russian NPPs and makes its own decision on

how many and which measures shall be performed within the limits of the financial means allocated.

4. «Program of measures to ensure nuclear, radiation, industrial and fire safety during operation of nuclear power plants for the current year» covers the expenses of the Operator related to safety enhancement.

Using reserve funds for nuclear and fire safety in accordance with annually generated by Rosenergoatom and Rosatom approved program of activities exclusively for the purposes of safety in the operation of nuclear power plants.

Purpose of Reserve - improving nuclear, radiation, industrial and fire safety.

Civil liability for nuclear damage is provided at the expense of safety in the nuclear insurance pool.

Q.No 104	Country Korea, Republic of	Article Article 11.1	Ref. in National Report 57
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Question/ Comment The current discussion of Article 11 of the National Report only deals with the situation at the operating organization. What is the current situation of financial and human resources of the nuclear regulator, Rostekhnadzor?

Answer Financing of Rostekhnadzor for the period from 2010 through 2012 is specified in Appendix 8 of the National report.
Total number of nuclear part of Rostekhnadzor amounts to about 950 people (headquarters and regional bodies).

Q.No 105	Country Austria	Article Article 11.2	Ref. in National Report 11.3, p60
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Question/ Comment It is stated that «Rosenergoatom's employees are certified to determine whether ... the certification is carried out once in five years». Could you please share with us, how the Certification Commissions are established and constituted?
Are some of them independent experts from universities, or Technical Support Organizations? Is there a written examination?
How is the process of certification of reactor operators, shift supervisors and plant managers approved and supervised by Rostekhnadzor and how it grants permits for NPPs personnel?

Answer Government of the Russian Federation dated March 3, 1997 № 240 approved «list of jobs of workers of nuclear facilities that must obtain permits RTN to carry out work in the field of nuclear energy.»
The procedure for obtaining permission is established by RTN administrative regulations for permission to carry out work in the field of nuclear energy workers of nuclear facilities. Certification is conducted in accordance with the «General provision on certification of managers, professionals and employees of» Rosenergoatom «. For the certification of the Director-General or the Director of the branch of «Rosenergoatom» appoints its order certifying commission. Where necessary, allowed the appointment of several certification commissions.
Recommended composition of certifying commission - no more than 7 people.
Not intended to include independent experts to the commission. Exam results are reflected in the protocol.
Prior to the oral examination the commission RTN permit use by persons certified for compliance with Rosenergoatom qualification requirements for the position, the last course on a post or profile work in the field of nuclear energy use in the certified educational institution that passes the test of practical skills (for operational staff) .
These requirements are checked RTN during the procedure of authorization. Functioning of the system of training in the EA and its conformity with the requirements verified RTN

in integrated , targeted inspections , as well as during monitoring activities in the framework of ongoing supervision.

To obtain the permit from Rostekhnadzor an employee of NPP shall undergo knowledge test in Rostekhnadzor.

With poor results of examination of « Rosenergoatom » has the right to appeal to Rostekhnadzor on rechecking knowledge after 1 month. When receiving an unsatisfactory mark on revalidating knowledge of the candidate remains eligible for re-sit the relevant examination after 6 month.

In case of unsatisfactory results of the second retake applicant may be submitted to seek authorization in accordance with established procedure not earlier than one year after the date of the second test .

If the employee fails the test NPP knowledge Rostekhnadzor and NPP management decided to obtain a permit that employee RTN , it must again be trained for the position , which includes , inter alia, knowledge testing and , if necessary , check practical skills. After that is the procedure for obtaining a permit primary RTN.

Q.No	Country	Article	Ref. in National Report
106	Poland	Article 11.2	p. 60-64
Question/ Comment	<p>1) Which particular NPP staff positions are subject to the certification once in five years?</p> <p>2) Are all the at-plant nuclear training centers in Russia equipped with full-scope simulators representing specific design features of respective plants?</p> <p>3) Please provide the outline of the initial training program for the key NPP operating staff (control room operators, shift supervisors, plant operation managers, and safety engineers – if any).</p>		
Answer	<p>1) Certifications (1 time per year or one every three years) subject to workers of NPP of «Rosenergoatom» in accordance with the approved list .</p> <p>2) All the at-plant nuclear training centers in Russia are quipped with full-scope simulators representing specific design features of respective plants.</p> <p>3) Prepare for the position of NPP personnel training programs carried out by the post and includes:</p> <ul style="list-style-type: none"> - theoretical training ; - practical training with technical training facilities , if required for this position ; - training in the workplace, if required for this position ; - primary test of knowledge ; - duplication , if required by this position ; - RTN permission to carry out work in the field of nuclear energy , if required for this position ; - allowed to work independently . <p>Training program for the position developed by the operator or nuclear power station based on the requirements of the standard organization «Requirements for training programs on the position (profession) and maintenance staff of nuclear power plants « (SRT 1.1.1.01.004.0441-2008).</p>		
Q.No	Country	Article	Ref. in National Report
107	Euratom	Article 12	12.1, page 66
Question/ Comment	<p>The report mentions the operating experience feedback system in place at NPPs for the analysis of operational events including those involving human or organisational error (blame free culture).</p> <p>What measures are in place to encourage personnel to report personal errors, in particular those that do not lead to operational events, but which have potentially serious consequences (near misses)?</p>		

Answer «Procedure of organization of work for preventing erroneous actions of personnel» put into force in the operating organization on May 31, 2012 stipulates that the principles addressing the prevention of erroneous actions of personnel are reflected in the safety Policy of the operating organization, particularly:

- principle of blame free culture in respect to the employees who committed erroneous actions;
- principle of personnel encouraging to report their errors;
- principle of timeliness and confidentiality of response to the personnel reporting their personal errors;
- principle of encouragement for the reports on safety problems, incidents and accident precursors as well as the proposals for their elimination.

Q.No 108	Country France	Article Article 12	Ref. in National Report § Art 12-1 - p. 66 and Art 12-3 - p. 68
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Question/ Comment Russian Federation mentions that the «man-machine interface is reviewed as well» and that the supervising of Rostechnadzor includes ergonomic causes of plant personnel errors. How does Russian Federation ensure that human and organizational factors have been correctly taken into account by licensees in the design of a modification or of a new plant?

Answer The activity of the operating organization related to collection, accounting and analysis of events related to «human factor» is described in every detail in section 12.1 of the National report. More detailed information to this issue can be obtained within the frameworks of bilateral or multilateral knowledge exchange among technical experts.

Results of event analysis are submitted to the design and construction engineering organizations to be accounted during design and construction engineering documentation development, as well as to Rostechnadzor to supervise that the safety-related events and events related to human factor occurred are taken into account in the new projects and in the projects of reconstruction when the applications for the license granting are considered or modifications in the conditions of the license in force are made.

With the aim to take the operating experience into account (including that related to human factors) during design or making further modifications in the design of nuclear facilities the State Corporation «Rosatom» developed and the operating organization, through its order of 31.05.12 №9/501-І, put into force the «Provision on the order of operating experience account during development and follow up of design and working (construction engineering) documentation of nuclear power plants», which defines the procedure of accumulating and use of the operating experience to ensure the timely implementation of corrective measures for quality assurance of the new projects and modifications thereof.

Impact of organizational factor on safety is evaluated in accordance with the «Provision on analysis of organizational changes and evaluation of their impact on NPP safety based on recommendations of IAEA» (ТІ 1.2.6.1.0098-2012) and methodological guides «Conduct of analysis of organizational changes impact on NPP safety» (ІД 1.3.3.99.0159-2013).

Fulfillment of the requirements of the above documents by the licensees is checked during inspection activity of operating organization.

Q.No 109	Country Lithuania	Article Article 12	Ref. in National Report Page 66 - 70
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Question/ Comment Could you please provide information how the human factor is considered, related to the personnel activity of contracting organizations, delivering the services for nuclear energy facilities? How the human factor is considered, when designing and of further modifications of nuclear installations?

Answer Consideration of the human factor related to the personnel activity of contracting organizations delivering the services for nuclear energy facilities is directly connected with the quality of work delivered by these organizations.

Requirements of Federal rules and regulations (NP-090-11 «Requirements to the quality assurance programs for the nuclear facilities») stipulate development of individual quality assurance programs of the organizations implementing their activity that impacts safety of nuclear facilities, at a separate stage of nuclear facility life cycle and/or when performance of licensed type of activity in the area of atomic energy use.

These individual programs describe the procedures that impact human factor consideration attributed to selection, staffing, training, qualification, upgrade and maintaining of the personnel involved in all stages of life cycle of the nuclear facilities, formation and maintaining of safety culture in the organizations, determination and analysis of the causes of the non conformities detected (taking into account the impact of non conformities on nuclear facility safety), development, fulfillment, check of corrective and preventing actions fulfillment and assessment of their efficiency.

Importance of human factor in the activity of the personnel of subcontracting organizations for safety of nuclear facilities being taken into account, a great attention is currently paid to formation of safety culture of the employees of these organizations.

For operating experience (including related to the human factor) when designing or making further modifications to the projects of nuclear installations in the State Corporation «Rosatom» developed «Provision on the treatment of operating experience in the development and maintenance of the project and working (design) documentation of nuclear power plants», which determines the order of accumulation and use of operating experience to ensure the timely implementation of corrective measures to ensure the quality of new projects and modifications.

Q.No 110	Country Pakistan	Article Article 12	Ref. in National Report General
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Question/ Russian Federation may like to share information regarding the measures taken by plant management/ training centers to increase the motivation level of operator crew and staff.

Answer At NPP:

- Included in the training and further qualification programs for operating and maintenance personnel training topics on psychological topics ;
- The minimum required amount of mental preparation is defined at least 4 hours of further qualification program on each shift operating personnel training program for the position of operational and management staff at least 8 hours ;
- Included and updated topics of the course of psychological training programs to maintain qualification of operating personnel ;
- Posted educational materials for self- psychological training ;
- Used a video simulator training while maintaining the control room operating personnel qualifications from the following detailed analysis and parsing of action for conscious formation motivational setting goals for safety.

NPP held a 3- day course of psychological training of operating personnel . This course takes the whole shift operating personnel in sanatoriums in the plant. With a staff of practiced skills removing emotional stress, improve self-control, effective communication. During the course of the staff on prescription also runs rehabilitation and fitness activities.

Q.No 111	Country Spain	Article Article 12	Ref. in National Report 68
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Question/ It is mentioned, at the beginning of Section 12.3, that plant managers need a Rostekhnadzor license to perform their functions.

Could you describe which are the requisites of plant management personnel to grant a license from Rostekhnadzor?

Answer Since the type of activity «management when construction and safe operation of nuclear facility», based on the Law dated 21.11.1995 № 170-ÔÇ, refers to the licensed type of activity, the position of director is included into the list of positions, which shall obtain licenses of Rostekhnadzor for the right to perform activity according to the Resolution of the Russian Federation government dated March 3, 1997 № 240, the NPP director, based on procedure specified by the relevant Administrative regulation, as per the earlier submitted application and after having undergone training, shall undergo knowledge test in the commission of the central headquarter of Rostekhnadzor in the form of oral exam consisting of 10 questions. If the answers to 80% of questions are admitted favorable by the commission, the candidate will be granted with the license for the right to perform activity at nuclear facility.

Q.No 112	Country Lithuania	Article Article 13	Ref. in National Report Pages 71 and 115
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Question/ Comment Could you please clarify which of the following regulations are currently in force: NP-011-99 «Requirements for quality assurance programmes for nuclear power plants» or NP-090-11 «Requirements for quality assurance programmes for nuclear power facilities»?

Answer Federal regulations in the area of atomic energy use NP-090-11 «Requirements for quality assurance programmes for nuclear power facilities» approved by the order of Rostekhnadzor dated 07.02.2012 № 85 were put into force on 28.07.2013. Federal regulations in the area of atomic energy use NP-011-99 «Requirements for quality assurance programmes for nuclear power plants» were recognized non applicable via order of Rostekhnadzor dated 01.10.2013 № 441. In pursuance of these orders Rosenergoatom issued the Plan of changeover from NP-011-99 «Requirements for quality assurance programmes for nuclear power plants» to NP-090-11 «Requirements for quality assurance programmes for nuclear power facilities»). The deadline of the changeover period to NP-090-11 was stated in this Plan– August 2014. Thus, NP-090-11 «Requirements for quality assurance programmes for nuclear power facilities» are currently in force on the territory of Russian Federation.

Q.No 113	Country Lithuania	Article Article 13	Ref. in National Report Page 73
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Question/ Comment It is stated that «In 2013 it is planned to inspect fulfilment of POKAS(O), POKAS(E), GOST R ISO 9001-2011 at five operating plants and one plant under construction.» Could you please clarify if it is a mandatory requirement to certify the Quality Assurance Systems of the Russian NPPs for compliance with GOST R ISO 9001-2011? Why does Rosenergoatom extend this certification to all NPPs being under operation and construction?

Answer Rosenergoatom made a decision of voluntary certification of the quality management system (hereinafter – QMS) for consistency with ISO 9001:2008 (GOST ISO 9001-2011) (at the moment of initial certification - GOST Đ ISO 9001-2008). Concern certification was initiated through order dated 29.11.2011 № 9/1236-İ «Organization of certification of Rosenergoatom QMS». Since the moment of this order issuance the activity on preparation and conduct of certification of Concern QMS graded into the rank of mandatory requirements. Rosenergoatom disseminates the certification of QMS to all operating NPPs and NPPs under construction with the aim to form the unified quality management systems. Fulfillment of requirements of ISO 9001:2008 results in quality improvement of the activity of the whole Concern as the operating organization, including all operating NPPs

and NPPs under construction, since the methods of management laid in the requirements of standard appear to be the instrument for improvement of the overall management system and this imposes the obligation on the Concern to continuously upgrade the efficiency of QMS (both for the headquarters and for all NPPs being under operation and construction).

Q.No 114	Country Lithuania	Article Article 13	Ref. in National Report Page 71 - 74
Question/ Comment	Could you please provide information how the requirements and recommendations of the IAEA GS-R-3, GS-G-3.1 and GS-G-3.5 documents have been considered in the quality assurance systems of the Russian NPPs? How the conformity of quality systems with these requirements and recommendations is inspected?		
Answer	<p>1. Requirements and recommendations of IAEA documents GS-R-3, GS-G-3.1 and GS-G-3.5 are taken into account in the quality assurance system of Russian NPPs when development of the policy in the area of safety, quality and environment of the NPP, when distribution of duties, authorities and responsibilities among the NPP officials, when distribution of functions among the structural units of the NPP and development of the procedure of interactions among them, when management of recourses, documentation, formation and maintaining of safety culture, implementation, measuring and assessment of the processes of the main activity and quality assurance system at the NPPs and others.</p> <p>2. Consistency of quality assurance systems of the Russian nuclear power plants with the requirements and recommendations of IAEA documents GS-R-3, GS-G-3.1 and GS-G-3.5 is checked during:</p> <ul style="list-style-type: none"> - inspections (audits) of NPPs and review of their quality assurance programs from the side of Rostekhnadzor, State Corporation «Rosatom», operating organization and self regulatory organizations; - peer reviews of WANO; - inspections within the frameworks of OSART missions; - certified and re-certified inspection audits from the side of the quality management system certification bodies; - internal audits of quality assurance systems and review of NPP quality assurance programs fulfillment. 		
Q.No 115	Country Spain	Article Article 13	Ref. in National Report 73
Question/ Comment	<p>By the end of Article 13, it is said that «quality control (verification of conformance) of the equipment important for safety for NPPs is conducted by authorized organizations of Rosatom and Rostekhnadzor».</p> <p>Could you develop more on the mentioned quality control, i.e.: on which are those organizations, on objectives of the Rosatom and Rostekhnadzor verifications and on their independence?</p>		
Answer	<p>1. State Corporation «Rosatom» and Rostekhnadzor, through a joint decision, appointed FSUE VO «Safety» and JSC «VPO «Zarubezhatomenergostroy» as authorized organizations for conformance verification (quality control) in the form of acceptance of products (including equipment, products, components, semi-products, and materials) supplied to the nuclear facilities.</p> <p>At this, verification of products conformance in the form of acceptance incorporates inspection of the state of the procedures used by manufacturing plant, supervision of technology observance, validation of conformance (including formalization of the relevant documents) of quantitative and qualitative indices of the products at all stages of their</p>		

manufacturing with the requirement of the contract, working design and process documentation.

2. Rostekhnadzor and State Corporation «Rosatom» carry out independent inspections of organizations involved in the nuclear activities with respect to fulfillment of the requirements of rules and regulations, other regulatory documents in the area of atomic energy use, validity conditions of permits (licenses) for the right to perform activity in the area of atomic energy use, due fulfillment of earlier issued prescriptions, ensuring safe operation of nuclear facilities, quality and safety culture assurance, organization of work with personnel, documentation, organization of accounting and control of nuclear materials, radioactive substances and radioactive wastes etc.

Concern supervises the contracts of assessment of products conformance concluded with AOs. Annual work is concurrently performed at more than five hundred manufacturing plants. Analytical data base is maintained for all manufacturing plants and equipment fabricated.

State Corporation «Rosatom» and Rostekhnadzor carry out independent external just-in-time and integrated inspections of fulfillment of quality requirements. Scheduled inspections are carried out on the sites of subsidiaries (of operating NPPs and NPPs under construction) and in the headquarter according to the schedule agreed with Concern (with respect to deadlines of inspections), out-of-schedule inspections are carried out by the decision of the State Corporation «Rosatom» or Rostekhnadzor management. For every inspection the inspection program is submitted to Concern, wherein the scope and subject of inspection are specified. As a rule, the below issues are incorporated into the inspection program:

- checking that RF legislation, Federal regulations in the area of atomic energy use and local regulatory documents of Concern and State Corporation «Rosatom» are observed.
- checking that the issued licenses or validity conditions of licenses for the right to perform activity in the area of atomic energy use are observed;
- functioning and efficiency of quality management systems;
- checking that the needed qualification level of personnel engaged in nuclear activities is ensured;
- others.

Elimination of violations and shortcomings detected during external independent inspections is compulsory for Rosenergoatom.

Q.No	Country	Article	Ref. in National Report
116	Turkey	Article 13	71-72
Question/ Comment	It is understood that Russia Federation is still using Quality Assurance approach in all nuclear facilities and activities. But also including Rosenergoatom Headquarters, many nuclear facility had already established Quality Management System (QMS). Do you have a consideration to transfer from Quality Assurance approach to Integrated Management System (IMS) concept according to IAEA GS-R-3 standard?		
Answer	Based on the norms stated in IAEA GS-R-3, a management system represents the complex of interrelated and interacting elements setting forth the policy and goals and enabling to achieve these goals through a safe, effective and efficient way. Management system incorporates the elements related to the issues of safety, health and environment protection, physical security, quality and economics to ensure an adequate account of safety at all stages of organization activity. All elements of management system under GS-R-3 are implemented and managed in Rosenergoatom at the high level management: safety, health, environment, physical security, quality and economics. At this, the safety assurance issues are of top priority, which was fixed in the respective policies (policy statements) of Concern. Follow up;		

upgrade and certification for conformity with international standards (ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007, ISO 50001:2011) of the above elements of management system under GS-R-3 were assigned to various structural units of Concern. All meaningful decisions for their development are made at the high management level of Concern (director general, first deputies director general) on application of a functional manager. In 2012 the branch of Rosenergoatom – «Smolensk nuclear power plant» created and certified the integrated magnet system incorporating quality management system, environmental management system, management system in the area of occupational safety and health. Currently the experience of Smolensk nuclear power plant is studied in Rosenergoatom with respect to its distribution to all branches (operating NPPs and NPPs under construction).

Q.No	Country	Article	Ref. in National Report
117	Turkey	Article 13	71-74
Question/ Comment	As one of the major nuclear industry country, Russia should have a strong safety culture concept in its all nuclear facilities and activities according to IAEA GS-R-3 standard. Could you give information about how Russia Federation establishing safety culture in its all nuclear facilities and activities?		
Answer	<p>Work on safety culture formation is performed at nuclear power plants of Rosenergoatom in accordance with the rules and regulations of requirements to safe and reliable operation of NPPs developed with due account of requirements stated in IAEA standards. Formation of safety culture is implemented by:</p> <ul style="list-style-type: none"> - necessary selection, training and preparation of personnel in each sphere of activity effecting safety and updating of personnel training procedures; - development of training materials addressed at enhancement of personal awareness of importance of safety aspects; - creation of optimal management structure, definition of goals, tasks, duties and zone of responsibilities of the structural units, implementation and strict observance of the discipline when clear distribution of personal responsibility of managers and executives; - development and strict observance of the requirements of work execution instructions in force and their regular updating taking into account the work experience gained; - organization of good practice and work experience distribution; - use of indices of safe operation of NPP power units; - development of methodological materials and conduct of self-assessment of operation safety; - preparation of NPP reports related to review of the state and assessment of safety culture; - preparation and implementation of measures for safety culture enhancement addressing the removal of «weak elements» detected from results of analysis of direct and root causes of violations in NPP operation; - formation of openness atmosphere in the teams to ensure free reporting by the personnel of safety related information, encouraging of acknowledgment of errors in the work that were committed, including those that did not cause any serious consequences. Thus, total psychological readiness for safety is achieved, which supposes self-criticism and self-inspection and provides the growth of feeling of personal responsibility related to safety issues. <p>A Concluding Day of Safety Culture is carried out annually in Rosenergoatom. In the course of preparation for the Concluding Day of Safety Culture every nuclear power plant develops the report, wherein they specify the results of their activity in the area of safety culture for the previous year: examples of implementation of safety culture principles are given, implementation of new systems and technologies for safety enhancement, work on</p>		

prevention of violations and disturbances in the NPP operation, results of assessment of personnel commitment to safety culture based on results of questionnaires etc. The reports also contain the information about the shortcomings that were observed in the NPP operation, for example: violations in operation classified above zero level under INES, resulting in environment contamination or violations of the safety engineering resulting in casualties. Based on analysis results of the submitted materials, the activity of NPP for the elapsed year is assessed and the nuclear power plants that reached the greater success are identified and encouraged.

The reports are accessible for all NPPs, which enables fast distribution of good practice to other NPPs.

Safety culture is assessed when operating organization and supervisory bodies check whether requirements of safety culture regulatory documents are fulfilled by the NPP.

Should any shortcomings are revealed in the area of safety culture, the measures addressed at their elimination are developed.

Q.No 118	Country United Kingdom	Article Article 13	Ref. in National Report 13
Question/ Comment	The text on Article 13 focuses on checks, including audits, that defined requirements are met. ISO 9001, which is the standard for quality management systems, requires reviews of management systems and continuous improvement. How have the requirements for reviews and continuous improvement by Rosenergoatom been implemented?		
Answer	<p>Quality system of Concern incorporates QMS (quality management system) in accordance with the standards of series ISO:9000 and quality assurance programs in accordance with Federal regulations in the area of atomic energy use NP-090-11 «Requirements to quality assurance programs for the nuclear power facilities». In pursuance of GOST ISO 9001-2011 and NP-090-11 the document RD EO 1.1.2.01.0573-2013 «Procedure of organization and conduct of quality system inspections of Rosenergoatom was put in force in Concern, this document covers the operating NPPs and NPPs under construction and defines the unified procedure of inspections of QAP (G), QAP (O) and requirements of GOST ISO 9001-2011 fulfillment. Inspections are carried out in accordance with the annual schedule approved by director general.</p> <p>Inspections of GOST ISO 9001-2011 requirements fulfillment by headquarter and branches (which are not NPPs) are carried out in accordance with the annual schedule of internal audits.</p> <p>Based on the inspection results of QAP (G), QAP (O) and requirements of GOST ISO 9001-2011 fulfillment and results of internal audits the corrective measures are developed. For assessment of efficiency the corrective measures are agreed with the quality manager before their validation and are checked during next inspections.</p> <p>Annual reports on review of quality system functioning are prepared: Report on QMS review from the side of management, annual report on assessment of efficiency (term of NP-011-99) of quality assurance programs fulfillment. Based on the executed review the activity on quality system improvement in Concern is planned: local regulatory documents and organization and administrative documents are issued or updated, training subjects are planned, schedules and areas of inspections and checks are developed etc.</p> <p>Besides, continuous activity is carried out for improvement of quality system of Concern in accordance with the comments and recommendations of certification bodies, State supervisory bodies of nuclear power facilities and State regulatory bodies of safety when nuclear power use.</p>		
Q.No 119	Country Austria	Article Article 14.1	Ref. in National Report 14.5, p82

Question/ Comment	The 6th National Report of the Russian Federation provides results of the probabilistic safety analyses (PSA) Level 1 for operating NPPs in Russia. Could you please indicate whether the PSA are based on the requirements in IAEA Safety Series? Could you please share with us the analytical scope of the analyses (e.g., internal events, external hazards, shutdown accidents)? Does Russian Federation have plans to implement PSA Level 2 analyses?		
Answer	<p>PSA -1 is carried out in accordance with recommendations stated in Rostekhnadzor Safety Series Guides, which, take into account the requirement of IAEA Safety Series Guides. Currently, PSA -1 has been developed for all PWR power units for internal events when power operation and when reactor shutdown.</p> <p>Performance of work on updating of PSA -1 to full-scale taking into account external impacts of nature and anthropogenic origin as well as internal fires and flooding is planned for 2014-2015.</p> <p>When performance of PSA Level 1 for NPPs with RBMK-1000 the internal fires, internal flooding and missiles and associated equipment failures are taken into account. For some power units the maximum calculated earthquake is considered, which is taken into account in the form of external power loss of the NPP site. As initial operation states the shutdown mode and power operation mode of the power unit are considered.</p> <p>PSA Level 2 was developed for all operating PWR units and submitted for verification to Rostekhnadzor.</p> <p>Preliminary PSA Level 2 was developed for several power units RBMK-1000.</p> <p>Development and updating of PSA Level 2 for power units with pressure-tube reactors were planned in the program of Rosenergoatom for the period from 2015 through 2018.</p>		
Q.No 120	Country Belarus	Article Article 14.1	Ref. in National Report info for Article 14
Question/ Comment	Which main conclusions were drawn from the results of an independent partner review of safe operation issues - IAEA OSART mission, held at the Smolensk nuclear power plant from the 5 to 22 of September 2011?		
Answer	<p>Based on results of IAEA OSART mission (from September 5 through 22, 2011) the following conclusions were made:</p> <ul style="list-style-type: none"> - relatively small areas for improvement were found; - majority of proposals for improvement were worded as «proposals», only two were worded as «recommendations»; - considerable achievements were recognized in the areas of: <ul style="list-style-type: none"> physical condition of equipment; order and cleanliness; operating documentation; - high preparedness of management and personnel of the plant for improvement of work on a long-term basis; - openness and good interaction. <p>On the whole, based on the mission results, 2 (two) recommendations and 10 (ten) proposals were issued and 10 (ten) examples of good practice were discovered, which are recommended by IAEA for implementation at the NPPs worldwide for safety improvement.</p> <p>Based on the mission results, the plan was developed for every of 12 problems, incorporating 128 measures, 120 measures out of which were implemented to the moment of repeated mission of OSART in 2013.</p>		
Q.No 121	Country Canada	Article Article 14.1	Ref. in National Report Page 75, Section 14.1 Line 1, Line 4 fro

Question/ Comment Section 14.1 of the report states that «Safety review in the course of licensing ... According to the Federal Law No. 347-FZ of 30 November 2011, the Operating Organization shall obtain a Rostekhnadzor's license for carrying out a certain activity (siting, construction, operation and decommissioning of the plant, design and manufacture of equipment for nuclear installations, review of justification of safety in the field of the use of atomic energy». Also on page 118, the report says «All repairs are carried out by the plant personnel and by contractors licensed by Rostekhnadzor». Please clarify whether these statements mean that all contractors must be licensed by Rostekhnadzor? Does it also mean that licensee's experts in safety review areas must have licences from Rostekhnadzor? Does it mean that Operation Organization has several licenses (operation, design, manufacturing, safety assessment and etc.)?

Answer Yes, all repair activities are performed by repair personnel of NPP and by subcontracting organizations that have licenses granted by Rostekhnadzor. Experts for safety assessment of the licensee must not have licenses granted by Rostekhnadzor. Operating organization has licenses for different types of activity.

Q.No 122	Country Canada	Article Article 14.1	Ref. in National Report Page 76, Section 14.1 Line 25
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Question/ Comment The report states that «The plant operating license is granted for the period of time, during which the plant operation safety is justified and confirmed by results of the safety justification review.» Please clarify whether first license is issued for a design life of 30 years or periodic renewal of the licence every 10 years is required?

Answer Based on i. 6 of «Provision of licensing in the area of atomic energy use», approved by the Resolution of Russian Federation government of March 29, 2013 № 280, the license is granted for the period defined on the basis of time during which the safety of the activity and facility on which or related to which the licensed activity is supposed to be performed is justified by the licensee and confirmed by the results of safety justification assessment. In other words, there are no requirements to the validity time of the first license for the nuclear facility operation in the Russian regulatory documents. Rostekhnadzor makes a decision on the time for which the license is issued for each nuclear facility individually and this decision is based on the results of the performed safety justification assessment. If, based on the safety justification assessment, the capability of the nuclear facility to fulfill its functions without threat of the personnel, public and environment within the entire design life time is confirmed, a license is issued for the time equal to that stated in the design.

Requirements to periodical safety assessment are stated in Article 26.1 № 170-ÔÇ

«Atomic energy use» of November 21, 1995 (Rev of 30.11 2011). In particular, the above Article states that during operation of nuclear facility or storage facility, based on the license issued for more than 10 years time period, the operating organization shall perform periodical safety assessment of nuclear facility or storage facility. The first periodical safety assessment of the nuclear facility or storage facility shall be performed 10 years after the beginning of their operation with further periodical safety assessment of nuclear facility or storage facility every 10 years up to the decommissioning.

Q.No 123	Country Germany	Article Article 14.1	Ref. in National Report section 14.5, pages 82-84
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Question/ Comment The chapter 14.5 (Tables 14.1 and 14.2) presents findings of the probabilistic safety analyses (PSA Level 1) for all operating NPP units. In the 2011 rapporteurs report it was stated that RF plans to perform Level 2 PSAs for all WWER units. What is the status of PSA Level 2 for your WWER plants?

Answer	PSA Level 2 was developed for all Russian operating VVER nuclear power plants .		
Q.No 124	Country India	Article Article 14.1	Ref. in National Report Page 81
Question/ Comment	In operational safety assessment at NPPs it is mentioned that Rosenergoatom carries out annual operational safety assessments for all operating NPPs. It also provides list of factors that are assessed. Does Rosenergoatom also assess NPP performance based on safety culture at these stations? If yes, then what is the methodology used to assess the same?		
Answer	<p>Annual operational safety assessments of the power units that incorporate feasibility study are implemented on the basis of STO 1.1.1.04.001.0143-2009 «Provision on annual reports on assessment of safe operation of nuclear power plants» developed by the operating organization and agreed with Rostekhnadzor. Methodology of feasibility study set up in STO 1.1.1.04.001.0143-2009 is based on the methods used in IAEA, WANO and Rosenergoatom as well.</p> <p>STO 1.1.1.04.001.0143-2009 stipulates use of the below technical and economic characteristics and indices:</p> <ul style="list-style-type: none"> - design rated heat power of reactor; - design electrical power; - permitted heat power; - generation of electrical power; - release of electrical power; - not generated electrical power; - number of reactor operation hours; - number of power unit operation hours; - operating factor (OF); - load factor (LF); - unit capability factor (UCF); - unplanned capability loss factor (UCL); - grid-related loss factor (GRLF). 		
Q.No 125	Country Korea, Republic of	Article Article 14.1	Ref. in National Report 5, 82
Question/ Comment	In table 14.1 and 14.2, the core damage frequencies are presented. Do these values in the table include internal flooding, internal fire and earthquake? If not, please provide core damage frequencies for these events.		
Answer	<p>Currently PSA-1 has been developed for all PWR power units for internal events both at power operations and reactor shutdown.</p> <p>Performance of work is planned for 2014-2015 on PSA-1 updating to full scale for PWRs taking into account external impacts of nature and anthropogenic origin and internal fires and flooding defining frequency of core damage for such events as well.</p> <p>Data submitted in tables for RBMK, fast breeders and heterogeneous loop reactors include internal flooding and internal fire, for some power units external power loss of NPP site caused by maximum design earthquake is taken into account.</p>		
Q.No 126	Country South Africa	Article Article 14.1	Ref. in National Report 14.1, 75
Question/ Comment	The details of section 14.1 as per CNS reporting are not reflected on the report (e.g. Safety Assessment within the Licensing Process and Safety Analysis Reports for different stages in the lifetime of the nuclear installations).		
Answer	Yes, the contents of section 14.1 does not fully comply with the recommendations of the		

CNS document INFCIRC/572. However, in our opinion, the topic recommended for lighting in this section are reflected in other sections of the report.

Q.No 127	Country South Africa	Article Article 14.1	Ref. in National Report 8.3, 75
Question/ Comment	In your system is regulatory approval needed for changes or modifications to a nuclear facility? If so, how does the operator know which modifications require approval, and on average roughly how many applications for such changes or modifications per annum are submitted for approval?		
Answer	Yes, operating organization must obtain the permit from the regulatory body for any modifications of design important for safety. Approximately 100-150 applications per annum.		
Q.No 128	Country Spain	Article Article 14.1	Ref. in National Report Pages 84-87
Question/ Comment	Are Rostekhnadzor inspections described in Section 14.6 applicable to nuclear installations other than NPPs (i.e.: mining, uranium enrichment, fuel fabrication, waste storage, spent fuel management and others)?		
Answer	Rostekhnadzor inspections are carried out at all assigned facilities, including those plants of fuel cycle listed in the question. The procedure of inspections carrying out, on the whole, is in conformity with the procedure set up for nuclear plants, at the same time when organization of inspections the specific features of the plant and degree of its potential hazard are taken into account.		
Q.No 129	Country Switzerland	Article Article 14.1	Ref. in National Report p. 82
Question/ Comment	«Table 14.1. Findings of the probabilistic safety analyses (PSA Level 1) for power operation of nuclear units with channel-type reactors» The RBMK show relatively low levels of CDF despite having a positive feedback coefficient. Can this be explained by backfitting measures and if so could the detail be given?		
Answer	Low levels of CDF are provided by: 1. Backfitting executed at RBMK power units. 2. Technical modifications: - transfer to new type of nuclear fuel (2,8 % U, 0,6 % Er); - implementation of new types of control rods (cluster control rods) and protection (fast emergency protection); - upgrade of equipment of special systems (implementation of double-set KCKUZ, AZRT, SCK «SKALA-micro»).		
Q.No 130	Country Switzerland	Article Article 14.1	Ref. in National Report p. 87
Question/ Comment	«The additional analysis of protectability of Russian NPPs initiated by Rostekhnadzor and carried out by Rosenergoatom in 2011 allowed identifying of measures, deadlines and necessary volumes of work to improve robustness of operating NPPs in Russia with regard to extreme external impacts of natural and anthropogenic origin. «		

please elaborate

Answer Additional safety assessment of NPP when extreme external impacts, including stress tests, was performed taking into account international requirements to methodology of risks and safety assessment for NPPs, which was developed by West-European association of regulatory bodies and coordinated with the European commission. The «Reports on NPP safety assessment when extreme external impacts» were developed in Concern for each NPP, which underwent assessment in Rostechnadzor. No other cooperation with neighboring countries during stress tests was performed. Every country performed stress tests for its own NPPs independently. To mitigate the revealed weaknesses of safety when extreme external impacts the «Updated measures for mitigation the consequences of beyond design basis accidents at NPP» were developed and are currently implemented for all operating NPPs, wherein fulfillment of the below measures is stipulated:

- performance of additional calculations for NPP safety justification;
- increase of robustness of the Unit and standby control rooms;
- implementation of instrumentation and controls and measuring channels to be serviceable under the conditions of beyond design basis and severe accidents,
- ensuring of serviceability of water and gas sampling systems under the conditions of beyond design basis and severe accidents;
- enhancement of seismic safety of NPP;
- improvement of protection against flooding at Balakovo NPP and NovoVoronezh NPP;
- improvement of protection against tornado impact;
- supply and implementation of emergency equipment at NPP:
 - mobile diesel-generators of large and middle capacity;
 - mobile diesel pump plants of high pressure and diesel engine-driven pumps for emergency feed up of reactor, steam generators, spent fuel pools and isolated spent fuel storage bays; upgrading of systems to ensure hydrogen explosion safety in containments and enclosure structures of NPP reactors;
 - introducing necessary modifications and addenda into NPP systems to prevent design basis accidents evolvement to beyond design basis accidents and using them during design basis and severe accidents management;
 - safety improvement for the isolated spent fuel storage bays;
 - development and verification of emergency documentation (design basis accident mitigation instructions, instructions for beyond design basis and severe accidents management and others);
 - improvement of emergency preparedness of NPP;
 - others.

The activities are performed by the Russian scientific, design, engineering, civil, installation and pre-operational test organizations, which have licenses of Rostechnadzor for the right to perform activity at NPP.

In accordance with the program of robustness improvement against extreme external impacts of natural and anthropogenic origin at Russian NPPs the below can be characteristic for the state of affairs and plans of work at pressure tube -type reactors and fast breeders:

- additional safety assessments of NPPs have been completed, including assessment of accidents, extreme external impacts from results of «stress-tests» and review of materials by Rostechnadzor;
- supply of emergency mobile equipment to NPP site was completed (diesel generators, diesel pumps and diesel engine-driven pumps);
- additional design approaches were developed for mobile equipment engagement;
- procurement of components is going on for implementation of additional design approaches directly at power units (implementation deadline – 2015-2016);
- updating of reports on in-depth safety assessment and deterministic safety assessment is going on (to be completed in 2015);

- preparation for PSA updating is in progress taking into account extreme external impacts and their combinations (to be completed within 2016 through 2018);
- justified final lists of beyond design basis accidents are being developed (to be completed in 2014);
- activities related to additional investigations and analysis of NPP materials of seismic zoning, synthesis of accelerograms and response spectra (to be completed â 2014.);
- equipping of power units with seismic protection systems if they are missed at these power units is going on (to be completed in 2015);
- equipping of power units with «emergency» I&Cs designed for operation under the conditions of beyond design basis accidents is going on;
- ice formation calculation technique is being developed for the emergency cooling pipes (to be completed in 2014);
- the complexes for spent nuclear fuel treatment and storage were put into operation at Kursk NPP and Leningrad NPP. Such a complex is planned for putting into operation at Smolensk NPP for 2015;
- activities aimed at emergency preparedness improvement are going on at NPPs and in the operating organization;
- number of emergency training drills for personnel actions in case of beyond design basis accidents was increased to two drills per a year;
- charts of personnel actions in case of severe beyond design basis accidents and procedure of these charts use were implemented at NPPs;
- updating of plant emergency documentation and beyond design basis accidents management instructions is scheduled for 2015-2016.

Q.No 131	Country Switzerland	Article Article 14.1	Ref. in National Report p. 82
Question/ Comment	Do the probabilistic safety analyses cited in the report include area events (especially internal fire) and external events (e. g. earthquakes, floods)?		
Answer	For the time being PSA Level 1 has been developed for all PWRs for internal events both for power operation and for reactor being shutdown. It is planned to perform work related to PSA Level 1 updating for PWRs to full-scale in 2014-2015 taking into account external impacts of nature and anthropogenic origin as well as internal fires and flooding identifying the frequency of reactor core damage for such events.		
Q.No 132	Country Switzerland	Article Article 14.1	Ref. in National Report p. 83f
Question/ Comment	Why are the severe core damage frequencies for Kursk-3 and Kola-4 so much higher than for the other units on the respective sites?		
Answer	PSA for power unit № 4 of Kola NPP was made in 1999. Not all the modification activities performed in 2000 through 2013 were taken into account in the PSA conclusions. Currently the PSA Level 1 for Kola-4 is being revised within the frames of the activity for safe operation justification during extended lifetime, and also considering implementation of measures on safety improvement when beyond design basis and severe accidents based on the consequences of the Fukushima Daiichi accident. PSA of Kola-3 (performed in 2010) identical to power unit-4 shows that after the planned upgrading the frequency of reactor core damage of power unit № 4 will not exceed the value of 10-5.		
Q.No 133	Country Ukraine	Article Article 14.1	Ref. in National Report pages 82-84

Question/ Comment	<p>National report provides PSA level 1 results for all operating NPPs.</p> <p>Has PSA level 2 been performed or planned to be performed? If so, for which NPPs and what are the results?</p>		
Answer	<p>PSA level 2 was developed for all operating VVER power units. Results of PSA level 2 for operating VVER power units can be submitted after final review in Rostechнадзор and comments removal.</p> <p>No development of PSA Level 3 for PWR power units is planned for today.</p> <p>Preliminary PSA Level 2 was developed for some RBMK-1000 power units.</p> <p>Development and updating of PSA Level 2 for pressure tube power units and fast breeders are planned for the period before 2018.</p> <p>Development of the first stage of PSA Level 3 at Smolensk NPP is planned for 2018.</p>		
Q.No 134	Country United Kingdom	Article Article 14.1	Ref. in National Report 14.1
Question/ Comment	<p>In making decisions on licensing, Rostechнадзор peer reviews safety justifications and inspects activities. Each decision may require a number of activities by Rostechнадзор. Please provide details of how Rostechнадзор takes all the evidence into account in its decision making process.</p>		
Answer	<p>Based on the Provision on licensing the activity in the area of nuclear energy use (Resolution of Russian Federation government dated March 29, 2013 № 280) when review of the documents submitted by the operating organization to Rostechнадзор for license obtaining the below is stated:</p> <p>A) consistency of the design, engineering and technological approaches with the Russian Federation legislation in the area of atomic energy use, requirements of Federal norms and regulations in the area of atomic energy use, as well as availability and consistency of the set up requirements with the conditions of radioactive wastes safe handling when licensed activity performance;</p> <p>b) comprehensiveness of technical and organizational measures to ensure safety when licensed activity performance;</p> <p>c) availability and consistency with the safety assurance requirements of the conditions for storage and organization of accounting and control of nuclear materials, radioactive substances and radioactive wastes, physical security of nuclear facility, radiation source, storage facility of nuclear materials and radioactive substances and storage of radioactive wastes, on-site and off-site emergency plans and readiness for fulfillment of necessary measures, as well as quality assurance systems and required engineering support of the licensed activity;</p> <p>d) ability of a licensee to ensure the conditions of safe execution of the licensed type of activity, safety of nuclear facility and executed work to meet the requirements of Federal norms and regulations in the area of atomic energy use;</p> <p>e) availability and readiness of the respective forces and means for mitigation of the emergencies when nuclear or radiation accident occur at the nuclear facility;</p> <p>f) ability of a licensee to ensure the conditions of safe termination of the licensed activity and the nuclear facility decommissioning and availability of respective design materials as well.</p> <p>Within the assesement of NPP safety justifying documents Rostechнадзор performs checking of trustworthiness of the information contained in the specified documents with the help of safety assessment (safety justification assessments) of NPP as well as inspections (audits) of a licensee (operating organization) and NPP, at which or in relation to which the licensed activity is planned for execution by a licensee.</p> <p>The issues described above are substantiated in the assignment for safety assessment performance (safety justification assessments) of NPP, and in the inspection (audit)</p>		

program, if any, of operating organization and NPP.

The decision on the license granting (change of license validity conditions) is made based on the complex of results of assessment and performed inspections.

Q.No 135	Country United States of America	Article Article 14.1	Ref. in National Report 14.5
Question/ Comment	Estimated core damage frequency at Russian plants was shown to be less than 10 ⁻⁴ , which was stated to be in accordance with 75-INSAG-12. However, INSAG-12 also says with severe accident management this number should be less than 10 ⁻⁵ , and best performing stations are at least less than 10 ⁻⁶ .		
Answer	<p>(1) Please clarify this discrepancy.</p> <p>(2) Please discuss your efforts in addressing core damage frequency</p> <p>1) When description of technical goals of safety, IAEA report INSAG-12, i.27 states the task for existing NPP power units to achieve the index of reactor core severe damage frequency lower than approximately 10E-4 for one reactor per year, which is announced in the report of the Russian Federation. As far as the index 10E-5 is concerned, report INSAG-12 announced it for future nuclear power plants, whereat the measures for safety improvement specified in i.25 will be consistently implemented. Index 10E-6 has never been mentioned in report INSAG-12. This index appears from direction in item 27 of this report for future power units of NPP saying that measures for severe accident management and mitigation of their consequences can reduce at least by one index the probability of large release of radioactive substance to the environment, which will require urgent response measures and not only a severe accident. In other words, this index refers not to the frequency of severe accident but to the frequency of its severe consequences for public and environment. In view of the above, no discrepancy between the sixth National report of Russian Federation on fulfillment of obligations resulting from Convention of nuclear safety with IAEA report INSAG-12 is observed.</p> <p>2) Section 6.3 and Appendix 4 of the Russian National report present the information about the activity of the operating organization Rosenergoatom related to upgrading of the operating power plants with the aim to improve their safety. One of the main instruments for implementation for this activity is a probabilistic safety analysis based on which the contribution of various measures to reactor core severe damage frequency is identified and weak sides of the power units that contribute much to the frequency of severe accidents are determined. Measures on upgrading first of all address removal of these weak sides.</p>		
Q.No 136	Country Bulgaria	Article Article 14.2	Ref. in National Report p. 82
Question/ Comment	Could Russia provide some information on the plans to implement PSA level 2 at Russian NPPs?		
Answer	PSA Level 2 was developed for all operating VVER power units. Development and updating of PSA Level 2 for pressure tube power units were planned in the program of Rosenergoatom for the period since 2015 through 2018.		
Q.No 137	Country Euratom	Article Article 14.2	Ref. in National Report table 14.2, page 84
Question/ Comment	There is a huge difference in the CDF figure between Kola NPP unit 2 and unit 4. Unit 4 licence expire in 2014. Will unit 4 be upgraded to the same level as unit 2 prior extension of the lifetime?		
Answer	Upgrade of power unit № 4 of Kola NPP is being performed within the frames of		

implementation of LTE (lifetime extension) investment project and will be completed before the design lifetime is over (October 2014). As assessed by PSA Level 2, CDF of power unit № 4 of Kola NPP will amount to $2,66 \cdot 10^{-6}$ 1/year, that will be in consistency with CDF of upgraded power units № 1, 2, 3 of Kola NPP with lifetime extended.

Q.No 138	Country Korea, Republic of	Article Article 14.2	Ref. in National Report 87
Question/ Comment	In connection with the Fukushima Daiichi accident, many analyses and inspections were done on Russian NPPs. Are they similar to EU stress test? If there are some differences, would you explain the differences?		
Answer	<p>In the Russian Federation stress tests were conducted for all existing and under construction NPPs based on the methodology developed WENRA and approved ENSREG.</p> <p>In addition to the European stress tests were analyzed anthropogenic and natural external events, according to the nomenclature established by the federal rules and regulations, «Accounting for external impacts of natural and man-made» (NP-064-05).</p>		
Q.No 139	Country Poland	Article Article 14.2	Ref. in National Report 82-84 and art. 18.4 (94-95)
Question/ Comment	A Level 2 PSA is nowadays commonly required for nuclear power plants worldwide (while in Russia Level 1 only). Whether, and if so, when this will be required also in Russia?		
Answer	<p>Recommendations to the composition and volume of PSA, including PSA Level 2, are given in Safety Guides Series of Rostechndzor. Into new RTN Administrative Licensing Regulations the requirement to submit PSA-2 documents as part of documents to obtain a operating license is introduced.</p> <p>PSA Level 2 was developed for all operating PWR power units.</p> <p>Development and updating of PSA Level 2 for pressure tube power units were planned in the program of Rosenergoatom for the period since 2015 through 2018.</p>		
Q.No 140	Country South Africa	Article Article 14.2	Ref. in National Report 14.3, 80
Question/ Comment	Please indicate the intended timeframe to complete classification of components of NPP's by their significance in terms of maintenance?		
Answer	<p>In accordance with the requirements of CTO 1.1.1.01.007.0281-2010 «Management of resource characteristics of NPP elements for all nuclear power units» Rosenergoatom has developed «The management program for resource characteristics », which include lists of specific elements of NPPs, resource characteristics which are subject to control and management at all stages of the life cycle of the nuclear unit . For each such NPP elements the Program defines the requirements to control and managing of resource characteristics depending on the degree of the influence of aging on the performance and complexity of NPP . Development of programs for all NPP units completed in 2013.</p>		
Q.No 141	Country South Africa	Article Article 14.2	Ref. in National Report 14.3, 79
Question/ Comment	Does the regulator review the maintenance programme prior to implementation, or any changes to the programme? Does the regulator review plant performance to verify the effectiveness of the maintenance programme?		
Answer	Maintenance programme undergoes assessment in Rostechndzor as part of the materials		

of NPP design. Requirements to the content of the maintenance and repair program are set forth in OPB -88/97. Item 5.8 of OPB-88/97 states that the reduction of the maintenance volume, decommissioning of separate systems and components and reduction of the number of shift operating personnel shall be performed in accordance with the changes in the validity conditions of license for NPP operation made in a set up order. Effectiveness of maintenance and repair program is inspected by Rostekhnadzor during just-in-time and integrated inspections of NPP.

Q.No 142	Country South Africa	Article Article 14.2	Ref. in National Report 14.3
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Question/
Comment Does the regulator review the maintenance programme prior to implementation, or any changes to the programme? Does the regulator review plant performance to verify the effectiveness of the maintenance programme?

Answer This is a repeated question, see an answer to previous question.

Q.No 143	Country United Kingdom	Article Article 14.2	Ref. in National Report 14.6
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Question/
Comment «If breaches of mandatory requirements are revealed, the authorized officials take measures to terminate such breaches» Please provide details of the range of measures that are available to inspectors.

Answer Officials of the safety State regulatory body, in the order stated by the Russian Federation legislation, are authorized to do the following:

- issue the prescriptions on termination of revealed breaches of mandatory requirements to the legal bodies;
- draw up the protocols on administrative breaches of law related to breaches of mandatory requirements, review the cases of the above administrative breaches of law and take measures for preventing such breaches;
- submit the materials related to breaches of mandatory requirements to the authorized agencies to settle the issues on initiation of criminal cases according to crime symptoms.

In accordance with the Code of Laws of Russian Federation on administrative breaches of Law of December 30, 2001 № 195-ÔÇ the below administrative punishments can be imposed and applied for committing the breaches of Law:

- warning;
- administrative penalty;
- disqualification;
- administrative holdup of the activity.

In particular, while investigating the administrative cases the following punishments can be imposed:

Breaches of norms and regulations in the area of atomic energy use invoke administrative penalty to be imposed on the citizens in the range from two to three thousand Rubles and on officials – from twenty to thirty thousand Rubles or disqualification for the period from six to twelve months, on legal bodies – from two hundred thousand to three hundred thousand Rubles.

Violation of the set up order of nuclear materials or radioactive substances accounting as well as failure to ensure fulfillment of rules of their storage and use invoke administrative penalty to be imposed on citizens within the range from four thousand to five thousand Rubles; on officials- from thirty thousand to forty thousand Rubles or disqualification for the period from one year to a year and a half; on legal bodies – from three hundred thousand to four hundred thousand Rubles.

Gross breach of norms and regulations in the area of atomic energy use invokes administrative penalty to be imposed on officials within the range from forty thousand to

fifty thousand Rubles or disqualification for the period from one year to two years; on legal bodies- from five hundred thousand to one million Rubles.

Q.No 144	Country United Kingdom	Article Article 14.2	Ref. in National Report 14.6
Question/ Comment	<p>In 2010-2012 Rostekhnadzor carried out 9229 inspections of NPPs. How are the results of these inspections used to:</p> <ul style="list-style-type: none"> • assess trends on sites and between sites • identify generic issues • inform future inspections 		
Answer	<p>The regional bodies submit the information about supervisory activity results to the structural units of Rostekhnadzor headquarter, namely:</p> <ul style="list-style-type: none"> - information about the inspections (audits) performed and results thereof; - results of analysis of the violations in the nuclear facility operation and results of control of the investigation progress as well; - information about applied measures of administrative influence. <p>In order to increase the effectiveness and information support of the supervisory activity of the regional bodies of Rostekhnadzor the structural units of Rostekhnadzor headquarter ensure generalization and analysis of the received information about the performed inspections (audits), the scientific technical support organizations being involved, and report these results to the regional bodies of Rostekhnadzor.</p> <p>With the help of the analysis results received from the organizations under inspection Rostekhnadzor and its officials perform:</p> <ul style="list-style-type: none"> - assessment of the safety state of nuclear facilities as well as assessment and predicting of the state of fulfillment of mandatory requirements by the organizations under inspection when performance of their activity in the area of atomic energy use; - planning of inspections (audits) for evaluation of comprehensiveness and trustworthiness of the submitted information and study of reasons and conditions that induced breaches of mandatory requirements or violations of operation of nuclear facilities; - performance (planning of performance) of additional or repeated investigations, tests, expertise and other measures for inspection involving the experts and expert organizations in the order set up by the Russian Federation legislation. <p>Based on the results of analysis of the information received from inspected organizations and should breaches of mandatory requirements are revealed Rostekhnadzor and its officials take all necessary measures set up by the Russian Federation legislation for their constraint.</p>		
Q.No 145	Country Austria	Article Article 15	Ref. in National Report 15.3, p92
Question/ Comment	<p>The 6th National Report of the Russian Federation notes that «... the actual gas/aerosol releases and discharges during normal operation of the NPP units were much below the permissible release and discharge amounts both in the reporting period and in the previous years.»</p> <p>What are the permissible limits for annual radioactive discharges with exhaust air and waste water (noble gases, iodine 131, aerosols and tritium) and what were the actual discharges from operational units during the recent decade?</p>		
Answer	<p>Before year 2014 the annual permissible releases of radioactive gases and aerosols to the atmosphere were stated by SP AÑ-03 depending on the type of reactor plant of nuclear power facilities (see the table given in the appendix to this answer).</p> <p>The actual releases of radioactive substances to the atmosphere were much below the values of permissible releases. History of noble gas releases, starting from 2002, is shown</p>		

in Figure given in the appendix to this answer.

Actual releases of other normalized radionuclides in 2012 are shown in the table given in the appendix to this answer.

In 2013 actual gas aerosol releases did not exceed 25 % PR (permissible release). Permissible discharge of radionuclides to water bodies are calculated and approved for every NPP taking into account hydrological characteristics of water bodies, type and nature of water consumption, as well as other specific features of the region wherein the nuclear power plant is located. Actual activity of liquid discharges of NPPs containing radionuclides of plant origin is significantly lower than the permissible values. Variation of «sliding» (average for the three successive years) values of discharge (in percentage of permissible content) of radionuclides of plant origin (tritium containing) of unbalanced water from NPPs of Rosenergoatom in 1995 through 2012 for the various types of reactor plants is shown in the Figure given in the appendix to this answer.

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Table 1 - The annual permissible releases of radioactive gases and aerosols to the atmosphere

Radionuclide	RBMK	PWR and fast breeder	HLR-6
NRG [TBq]	3700	690	2000
¹³¹ I (gaseous + aerosol forms) [GBq]	93	18	18
⁶⁰ Co [GBq]	2,5	7,4	7,4
¹³⁴ Cs [GBq]	1,4	0,9	0,9
¹³⁷ Cs [GBq]	4,0	2,0	2,0

Figure 1 - The history of noble gas releases, starting from 2002

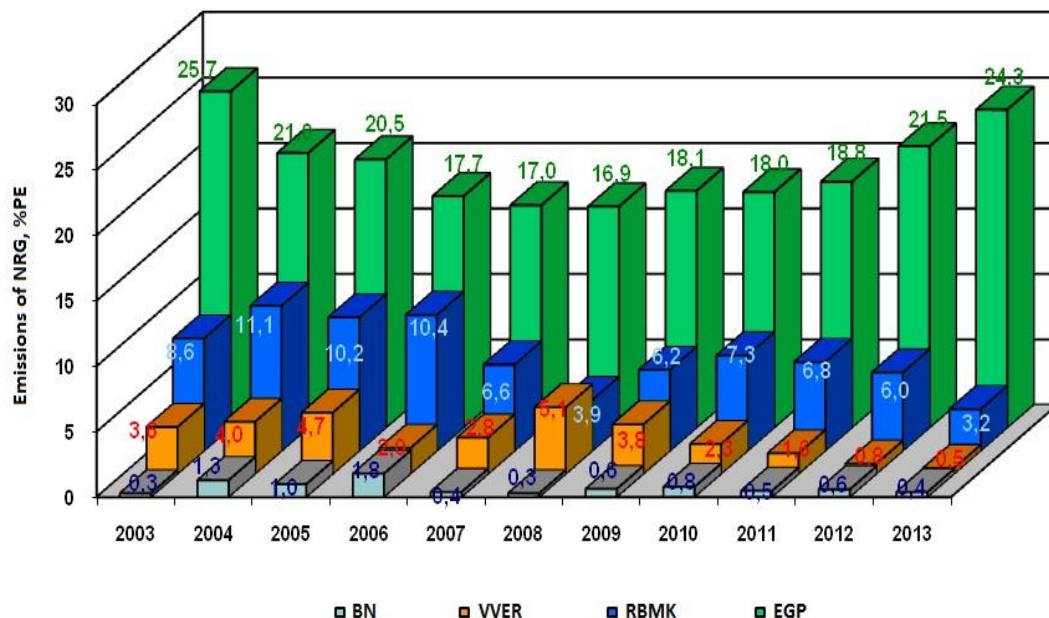


Table 2 - The actual releases of other normalized radionuclides in 2012

NPP	I-131		134-Cs		137-Cs		60-Co	
	GBq/year	% PR	MBq/year	% PR	MBq/year	% PR	MBq/year	% PR

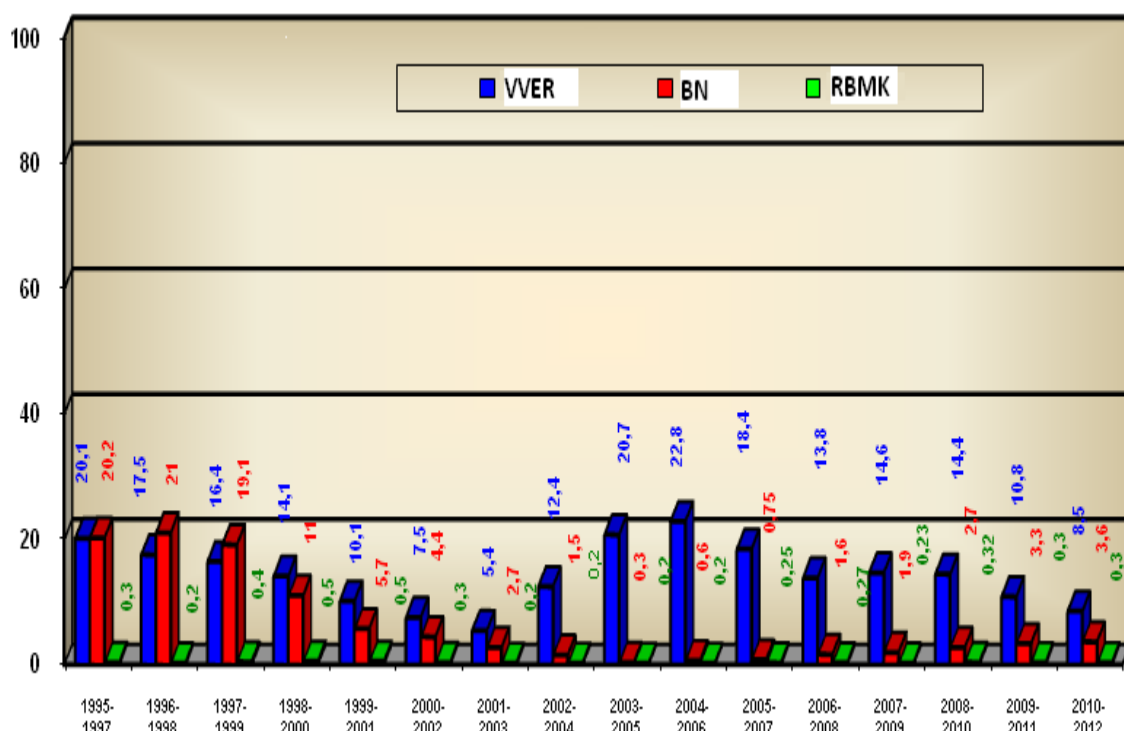
BalNPP	*	-	0,13**	0,014	3,88	0,19	31,5	0,43
BelNPP	*	-	*	-	13,0	0,65	1,3**	0,018
BilNPP	*	-	*	-	*	-	*	-
KlnNPP	0,49**	2,7	5,38**	0,6	9,88	0,49	3,1**	0,04
ColNPP	*	-	*	-	*	-	*	-
KurNPP	5,04	5,4	21,1**	1,5	61,9	1,6	226,2	9,0
LenNPP	0,023**	0,02	0,37**	0,03	32,9**	0,82	101,0	4,0
NvoNPP	0,48	2,7	100,0	11,1	240,0	12,0	460,0	4,7
RstNPP	*	-	*	-	0,98**	0,05	2,02**	0,03
SmoNPP	0,16**	0,18	*	-	1,37**	0,03	63,6**	2,5

*below lower limit of detection of devices (minimum detected activity – MDA).

**for radionuclides the summarized releases for a year are given without values of releases corresponding to MDA being taken into account.

Level of registration set up at Kola NPP: for NRG – 1,9E11 Bq/day; for ¹³¹I – 3,7E06 Bq/day; for ⁶⁰Co, ¹³⁴Cs, ¹³⁷Cs – 3,7E06 Bq/month.

Figure 2 - The variation of “sliding” (average for the three successive years) values of discharge (in percentage of permissible content) of radionuclides of plant origin (tritium containing) of unbalanced water from NPPs of Rosenergoatom in 1995 through 2012 for the various types of reactor plants



Q.No 146	Country Canada	Article Article 15	Ref. in National Report Page 88
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Question/ Comment Do the environmental policies, systems and programs and radiation protection align with international expectations for environmental management systems such as ISO14001 and ICRP? What are the regulatory oversight programs in place?

Answer System of environmental management (SEM) was established and is continuously updated in Rosenergoatom. Starting from 2011 SEMs of Rosenergoatom headquarter and of all operating nuclear power plants have been certified for compliance with the requirements of the international standard ISO 14001:2004.

Key plants of the State Corporation «Rosatom» have undergone certification for the system of environmental management (SEM) compliance with the international standard ISO 14001. Reports containing the environmental policy implemented by these plants, tasks, goals and efficiency are published by these plants on a regular basis. They are available in the official cite of the State Corporation «Rosatom» through address www.rosatom.ru/partnership/environmentalmanagement/. The reports are submitted in the Russian language.

Control over the environment and dose loads on the population by federal authorities - Rosprirodnadzor, Rospotrebnadzorom and FMBA.

Q.No	Country	Article	Ref. in National Report
147	France	Article 15	§ 15-1 - p. 88

Question/ Comment Could Russian Federation explain how it implements ICRP 103 in national regulations, especially concerning the dose limit for lens of the eyes?

Answer Approaches to radiation safety regulation recommended by ICRP № 103 were adopted in document RSR-99/2009 SanPiN 2.6.1.2523-09 (approved by the Resolution of the Chief State environmental health officer of Russian Federation of July 7, 2009 № 47) and by Federal Law dated 09.01.1996 № 3-ÔÇ «Radiation safety of public» (regarding limiting of annual effective doses. In particular, the annular dose limit for lens of the eyes set up in Table 3.1 of RSR-99/2009 for the personnel of group A amounts to 150 mSv/year. The annular dose limit for lens of the eyes specified in the same Table for the public amounts to 15 mSv/year.

Q.No	Country	Article	Ref. in National Report
148	France	Article 15	§ 15-3 - p. 92

Question/ Comment Does or will the Russian administration perform radiological surveillance in the vicinity of the facilities? Is the best available technology (BAT) principle to manage discharges in force in the set of Russian regulations concerning the protection of the environment?

Answer Article 21 of Federal Law of 21.11.1995 № 170-ÔÇ «Atomic energy use» states that for timely detection of radiation environment change, assessment, predicting and prevention of possible negative consequences of radiation impact on the public and environment as well as for the systematic submission of the respective prompt information to the State power authorities, the nuclear energy regulatory bodies, safety State nuclear energy regulatory bodies and organizations intended for taking all necessary measures for preventing or mitigation of radiation effect on the territory of Russian Federation carry out State monitoring of radiation environment.

Principle of the best available technologies use when releases and discharges handling (including those radioactive) is laid in item 2 of Article 23 of Federal Law of 10.01.2002 № 7-ÔÇ «Environmental protection», which states that the normatives of permissible releases and discharges of substances and microorganisms shall be set up for stationary, mobile and other sources using the best available technologies taking into account economic and social factors. When doing so, the term «the best available technology» is interpreted in this Law as the technology based on the recent achievements of science and engineering addressing mitigation of negative effect on the environment and having the set up lifetime for practical use taking into account economic and social factors.

Regular radiation monitoring of environmental facilities is carried out by the forces of the NPPs. Safety regulatory agencies (Rospotrebnadzor) carry out random duplicating

monitoring in the vicinity of the facilities. As one of the basic principles BAT use is laid in the Federal Law of 10.01.2002 № 7-ÔÇ «Environmental protection» (Article 3). Article 14 of the specified Law declares that tax and other remissions are granted for BAT implementation. Complicated multi-component purification systems are used at all Russian NPPs in the system of air purification before its release to the atmosphere. Final purification filters of effluents before their discharge to the open water reservoirs are used at the power units of the old NPPs (PWR-440). Radioactive effluents discharge to the open water reservoirs is eliminated at PWR-1000 power units.

Q.No 149	Country France	Article Article 15	Ref. in National Report § 15-2 and 15-3 - p. 90 to 92
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Question/ Comment Could Russian Federation give some examples of provisions (taken by license holders) which have contributed to the reduction of: occupational exposure and discharges to the environment?

Answer The operating organization started to deal with the issues of the reduction of occupational exposure of the NPP personnel since 1992 by way of preparation for transfer to new dose limits (Publication 60 ICRP 1990) adopted in Russia by Federal Law «Radiation safety of public» (1996) and put into force on 01.01.2000.

Activity on reduction of occupational exposures of the personnel of Russian nuclear power plants is ensured due to implementation of the complex of organizational and technical measures addressing the improvement of radiation environment, reduction of time of the personnel staying in the ionizing radiation fields and improvement of the dose expense management system as well.

The achieved results are stipulated, among others, by implementation of ALARA technology at the NPPs.

The following can serve examples of such measures: more widely use of quick-detachable protective screens, quick-detachable heat insulation, electronic direct reading dosimeters, various computer-aided devices and accessories, reduction of the number of dead-air spaces, optimization of the number of personnel, deadlines of maintenance work performance etc. Improvement of the systems of monitoring, accounting, analysis and planning of the occupational exposures contributes greatly to the improvement of the system of collective doses of the personnel. In particular, planning of collective doses of the NPP personnel is carried out not only for the period of the specific work performance, but for the period of repair cycles as well, for one year and also for the prospective (up to 5 years). Average value of reduction of NPP personnel occupational exposure for the recent 15 years amounts to 3 times.

Considerable reduction (by 1-2 indices) of radioactive substances release from the Russian NPPs to the environment for the last decade is in the first turn stipulated by the improvement of quality of the fuel elements manufacturing (reduction of the number of fuel elements with leaks in the reactor core), implementation of up-to-date purification technologies of gas-aerosol process media and enhancement of safety culture of the personnel.

Q.No 150	Country Korea, Republic of	Article Article 15	Ref. in National Report 1, 90
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Question/ Comment 1. There is an expression in the National Report that j° when the actual nuclear plant release and discharge lead to the public dose of not less than 10 uSv/yr for each impact factor j^\pm . The impact factors have two exposure pathways: Gaseous and Liquid. Which impact factor do you mean in the above quoted sentence?

2. Please explain dose limits(or risk limits) and assessment point to protect the public in case of DBA and severe accidents.

Answer It means that allowable releases of radioactive substances in the atmospheric air and discharge of radioactive substances in water bodies with NPP liquid discharges create exposure dose not more than 10 mSv/yr (i.e. in total 20 mSv/yr) separately for every exposure factor.

The following criteria are established in SP AS -03 to confirm efficiency of localizing NPP safety systems in case of design-basis accidents on them: for old NPP units (designs of which were approved before 2000) on SPZ limit should not require performance of mandatory protective measures (level B of Table 6.3 NRB-99/2009), for NPP units, designs of which were approved after 2000, should not require any protective measures. For the case of severe beyond-design-basis accidents limits for exposure doses are not established. There are only values of anticipated exposure levels, which require urgent intervention and these levels comply with those recommended by ICRP.

Q.No 151	Country Lithuania	Article Article 15	Ref. in National Report Page 90
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Question/ Could you please specify the number of «A» category workers, whose annual external
Comment exposure dose exceeds 20 mSv? What is the procedure for approval and coordination of the planned exposure of a worker, exceeding 20 mSv/year, and how compensation of the excess is organized, provided that the total individual dose for 5 years shall not exceed value of 100 mSv.

Answer In the result of organizational and technical measures on nuclear power plants implemented within the scope of programs of Operating organization and NPP the quantity of workers was minimized, exposure doses of which exceed the reference level, making 20 mSv per year (see the figure given in the appendix to this answer).

The procedure of approval and agreement of rated exposure of the worker more than 20 mSv/year (before January, 2011 – the reference level of individual exposure dose for NPP personnel) is specified in the Provision on the procedure of issuing a permit for the operating organization to exceed the reference level of the individual exposure dose of personnel and persons, delegated to nuclear power plants (RD EO 0280-01).

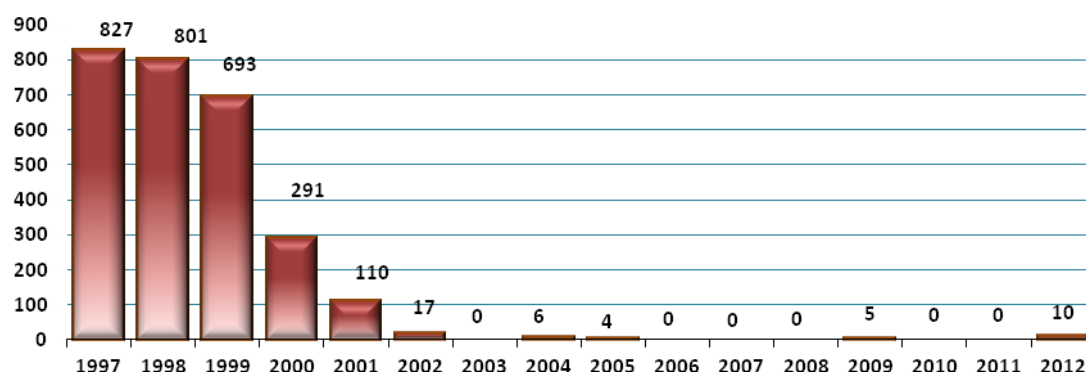
NPP application for issuing a permit to exceed the reference level (not more than 50 mSv per year) of the individual dose is considered and signed by departments of emergency preparedness and radiation protection, for NPP operation (depending on the reactor type), NPP maintenance, repair and installation shall be agreed upon with the General Inspection of JSC «Concern Rosenergoatom» and approved by Deputy Director General – director on NPP production and operation.

Availability of the permit to exceed the reference level of the individual dose does not release NPP from the necessity to guarantee non-exceeding of the basic dose limit, which equals to 50 mSv/year, and also the basic limit, which equals to 20 mSv/year on the average for any consecutive 5 years.

In 2012 the operating organization issued a permit No.1 dated 09.08.2012 to exceed the reference level, which equaled to 18 mSv, during the work performance on NPP units 3-4 for 29 CRW workers of Novovoronezh NPP. Actual individual exposure doses, exceeding the reference level were registered with 16 workers of Novovoronezh NPP. Meanwhile, none of their individual exposure doses exceeded the allowed levels. Doses of more than 20 mSv were registered with 10 workers. The maximum individual dose rate made up 26,58 mSv. Basic dose limits equaling to 50 mSv/year and 100 mSv for the period of 2008-2012 were not exceeded.

Support Figure - The quantity of workers, exposure doses of which exceed the reference level,
Document making 20 mSv per year

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Q.No 152	Country Lithuania	Article Article 15	Ref. in National Report Page 90 - 92
Question/ Comment	Could you please specify the level of the worker exposure at which the restrictions on access of the worker to radiation-hazardous works come into force?		
Answer	<p>According to NRB-99/2009, persons that were exposed to radiation with the effective dose exceeding 100 mSv/year, should not be exposed with the dose of more than 20 mSv/year in subsequent operation.</p> <p>Persons that were exposed to the dose of more than 200 mSv/year, should immediately be withdrawn from the radiation dose and administered for medical examination. Subsequent work with radiation sources for these persons can be allowed only according to the prescribed order considering their consent by the decision of the competent medical board.</p>		
Q.No 153	Country Lithuania	Article Article 15	Ref. in National Report Page 90
Question/ Comment	Could you please specify the maximum and average levels of internal exposure dose for the NPP with RBMK type reactor - Leningrad NPP?		
Answer	<p>Individual doses of internal exposure for Leningrad NPP personnel in 2013:</p> <ul style="list-style-type: none"> - maximum value – 2,2 mSv; - average value– 0,008 mSv. <p>Internal exposure of Leningrad NPP personnel in 2013 was related to the performance of especially radiation hazardous works on restoration of resource characteristics of graphite stacking of the NPP unit No.1.</p> <p>In previous years, for example in 2012, the maximum dose of internal radiation of Leningrad NPP personnel was 1,2 mSv, the average value – 0,007 mSv.</p>		
Q.No 154	Country Lithuania	Article Article 15	Ref. in National Report Page 92
Question/ Comment	Could you please provide information how it will be performed gamma-monitoring in emergency preparedness and surveillance zones of the new NPP in Kaliningrad region?		
Answer	<p>Gamma-monitoring of the NPP located in Kaliningrad region will be performed in the automatic mode using the automated radiation environment monitoring system (ARSMS) in the environment.</p> <p>ARSMS system is an independent subsystem of the NPP radiation monitoring system (RMS), working in the mode of data exchange with on-site RMS subsystems.</p> <p>ARSMS helps solve the following issues:</p> <ul style="list-style-type: none"> - receiving of information on the value and nuclide composition of the gas-aerosol emission into the atmosphere from radiation monitoring systems of NPP units; 		

- incorrect monitoring of radiation and meteorological parameters in the region of NPP location;
- prediction of radiation environment on the terrain and population exposure doses;
- assessment of the scope of accident consequences;
- providing information necessary for making a decision on taking measures related to protection of the population, including evacuation;
- providing information necessary to perform works on accident management;
- individual dosimetric monitoring of personnel engaged in works related to accident management.

To solve the above-mentioned issues ARSMS performs the following monitoring activities:

- continuous remote dose control and gamma-radiation dose rate on standard control stations;
- quasicontinuous control of aerosol volumetric activity in the open air by continuous sampling of aerosols to the filter, performed by the filter-ventilation unit and periodical measuring of filter activity using laboratory radiometers and spectrometers;
- periodical control of radionuclide content in samples of external entities (atmospheric depositions, precipitation, ground, ground water on NPP site, water of water bodies, bottom depositions, land plants and animals). The control is performed by sampling with their subsequent measuring using laboratory radiometers and spectrometers;
- continuous remote control of meteorological parameters in the range of heights from the ground and to some hundreds of meters;
- carrying out of radiation surveillance on the terrain in the post-accident period.

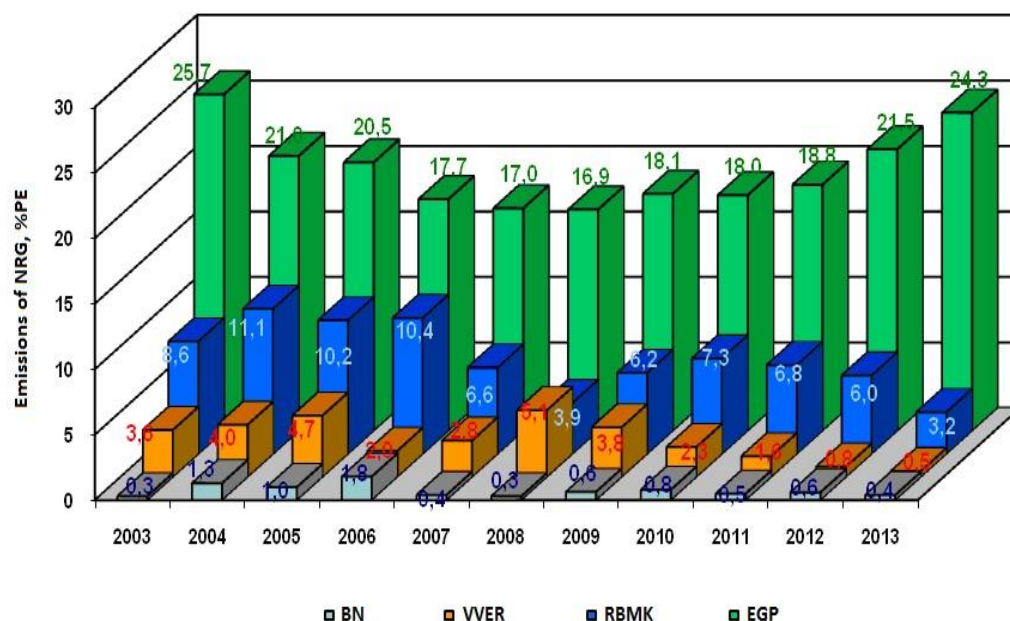
To perform monitoring of the radiation environment on the site and in the area of scheduling of protective measures stationary sites and forming of radiation surveillance teams from NPP personnel, equipped with the mobile radiometric laboratory are provided.

Q.No	Country	Article	Ref. in National Report
155	Lithuania	Article 15	page 92
Question/	Could you please provide the information on basic results of environment monitoring and		
Comment	basic results of control of radioactive substances release into the environment?		
Answer	<p>NPP radiation exposure to the population and environment is revealed in emission of radionuclides in the environment. The quantity of radionuclides released in the environment in the mode of normal operation is regulated in the norms established by safety regulation bodies and during the usage of nuclear energy. Currently the norms of allowable emissions (AE) of radioactive substances in the atmospheric air are established at the level, where exposure dose of persons from the critical population group in the area of NPP location is negligible (less than the minimum significant dose of 10 iSv/year), that is the radiation hazard for the population is acceptable by all means (less than 10E-6 year-1).</p> <p>Actual gas-aerosol emissions for the last decade were significantly lower than the values of allowable emissions (see the figure given in the appendix to this answer).</p> <p>With this rate of radionuclide emission into environment the radiation hazard for the population considering routine radionuclide emissions beyond the NPP limits in the mode of normal operation is acceptable by all means (less than 10E-6 year-1).</p> <p>The analysis of these radiation monitoring results in the area of NPP location indicate the following:</p> <ul style="list-style-type: none"> - the amount of NPP emissions at the level of acceptable 100 % is certainly admissible; - actual NPP emissions are optimized; - there is not a revealed effect of nuclear power plant operation on the condition of external entities, considering seasonal and statistical contamination fluctuations of these facilities 		

with artificial radionuclides from total depositions as a result of nuclear testing and Chernobyl accident;
 - the task of NPP is to retain the attained emission level.

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Figure - The actual gas-aerosol emissions for the last decade



Q.No 156	Country Poland	Article Article 15	Ref. in National Report p. 88-89
Question/ Comment	<p>1. In 2011 new IAEA radiation protection standards have been issued – GSR Part 3 (interim), in which dose limits were modified (see: Schedule III. Dose Limits for Planned Exposure Situations). In this connection, whether, and if so when, the dose limits laid down in the Federal Law FZ-3 will be modified?</p> <p>2. It is a common regulatory practice now (in particular, in WENRA member countries) to limit an environmental radiation impact of NPPs during normal operation by setting an annual effective radiation dose constraint to the members of the public at 0.3 mSv/year, whether this limit be lowered also in Russia (from 1 mSv/year being currently in force)?</p>		
Answer	<p>1. Currently the decision of this issue is being considered. The decision on modifying dose limits laid down in the Federal Law FZ-3 is within the competence of safety regulatory bodies for using nuclear energy and shall be taken, as a rule regarding the opinion of Russian Scientific Committee for Radiation Protection (RSCR).</p> <p>2. This practice of limiting the radiation effect on the population has been implemented in the Russian Federation. Such quotes are established for the total population exposure from radioactive gas-aerosol emissions into the atmosphere and liquid discharges in surface waters in general for NPP irrespective of the number of power units on the site. Thus, according to item 5.6 of SP AS -03, a population exposure quota has been set up at 250 mSv/year (200 mSv/year considering gas-aerosol emissions and 50 mSv/year considering liquid discharges) for currently operating NPPs, and 100 mSv/year (50 mSv/year considering gas-aerosol emissions and 50 mSv/year considering liquid discharges) – for designed and constructed NPPs.</p>		
Q.No 157	Country Poland	Article Article 15	Ref. in National Report Article 15.3

Question/ What about measures implemented to limit and manage of radioactive effluents from

Comment NPPs?

Answer For the last decade a significant (for 1-2 value orders) decrease of Russian NPP radioactive substance release into the environment was achieved as a result of fuel assembly quality improvement (decrease of the quantity of leaky fuel elements in the core), using up-to-date technologies of purifying gas-aerosol process media and improvement of safety culture. Considering the achieved NPP safety level in the mode of normal operation of energy units, norms of allowable emissions of radioactive substances into the environment are set at the level at which the exposure dose of persons from the critical population group residing in the vicinity of the nuclear power plant is negligent, i.e. lower than the minimum significant dose of 10 mSv/year.

Actual NPP gas-aerosol emissions are significantly lower than the allowable values. A yearly effective dose, which equals to 10 mSv/year in compliance with international (Safety Standards Series No. 115) and Russian (NRB-99/2009, OSPORB-99/2010) documents is a criterion of releasing the source from the area of radiation safety control, i.e. in the case under consideration it is the lower limit of possible population exposure from a separate radiation factor during the optimization of radiation protection. Considering the above-mentioned, the effect of Russian NPPs on the environment and population regarding gas-aerosol emissions is optimized.

Q.No 158	Country Slovenia	Article Article 15	Ref. in National Report 15.4/92
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Question/ Comment How are the results of the environmental radiation monitoring and effective dose presented to the members of the public? Are they available to the public?

Answer According to SP AS-03, the information on radiation environment in location areas shall be provided to executive bodies, safety control bodies, including citizens, public associations and mass media in accordance with the established procedure.

For example, to provide the means of public information on the radiation environment in inhabited localities of control areas around NPP in the location of automated radiation environment monitoring system there are information boards, showing the equivalent dose value on a real time basis.

Besides, the information on radiation environment in sanitary protection zones and control areas around NPP is also available at the web-site of «Radiation environment of Rosatom organizations» <http://www.russianatom.ru> both on a real time basis and in archives for previous time periods.

Q.No 159	Country Spain	Article Article 15	Ref. in National Report 93
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Question/ Comment What is the role of Rostekhnadzor regarding the enforcement of the Radiation Protection Standards NRB-99/2009?

Answer Normative documents approved by RTN found that nuclear facilities , which are covered by one or other of the above documents , meet the safety requirements , if its radiation impact on personnel and the public during normal operation , violations of normal operations , including design basis accidents , not that exceeds the established doses to personnel and the public. Restrictions on the allowable radiation dose of the population and personnel during normal operation , as well as intervention levels in radiation accidents , set in NRB-99/2009 .

Verification of compliance of a nuclear facility or activity in the field of nuclear energy requirements NRB-99/2009 RTN provided in the licensing procedure , checking not exceed NRB-99/2009 criteria.

Q.No	Country	Article	Ref. in National Report
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160	Spain	Article 15	89
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Question/Comment What are the values of the dose limits for planned increase of exposure of personnel carrying response activities to prevent the progression of the radiation accident established in NRB-99/2009?

Answer Section 3.2 of NRB-99/2009 specifies the following requirements considering the planned exposure increase:

«3.2.1. Planned increase of exposure for group A personnel (exposure exceeding the design limits for normal exposure doses) in order to prevent development of an accident or mitigation of its consequences can be permitted only in case of necessity to save people and (or) prevent their overexposure. The planned increase of exposure level is allowed for men older than 30 year only if they provide their voluntary written consent, after informing on possible exposure doses and health risks.

3.2.2. The planned increase of exposure in the effective dose up to 100 mSv/year and equivalent doses not exceeding two-fold values of established limits for normal exposure doses can be permitted by organizations (departments) of Federal executive bodies exercising government sanitation and epidemiological surveillance at the level of the Russian Federation subdivision, and exposure in the effective dose up to 200 mSv/year and equivalent doses not exceeding four-fold values of established limits for normal exposure doses can only be permitted by Federal executive bodies authorized to exercise government sanitation and epidemiological surveillance.

Increase of exposure is not allowed:

- for workers, previously exposed throughout the year in the result of some accident or planned increase of exposure with the effective dose of 200 mSv or equivalent dose that four times exceeded corresponding limits for normal exposure doses;
- for persons with medical contradictions to work with radiation sources.

3.2.3. Persons that were exposed to radiation in the effective dose exceeding 100 mSv during a year shall not be exposed to radiation in the dose exceeding over 20 mSv/year in their subsequent work. Exposure with the effective dose exceeding 200 mSv/year shall be considered as potentially hazardous. Persons that were exposed to this radiation level should immediately be withdrawn from the radiation zone and undergo medical examination. Subsequent working of these persons with radiation sources can be allowed only on an individual basis considering their consent by the decision of the competent medical board».

The above-mentioned values of established limits for normal exposure doses are specified in Table 3.1 of NRB-99/2009 and satisfy dose limits recommended in Table 6 of ICRP publication No. 103.

The Table given in the appendix to this answer shows the maximum limiting values of doses for the planned increase of exposure in order to prevent development of an accident or mitigation of its consequences.

Support Documents Table - The maximum limiting values of doses for the planned increase of exposure in order to prevent development of an accident or mitigation of its consequences

Value	Maximum limiting values, mSv
Effective dose	200
effective dose in crystalline	600

lens, skin, hands and feet	2000 2000
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Q.No	Country	Article	Ref. in National Report
161	Spain	Article 15	89

Question/ What are the basis for the dose limits for planned increase of exposure of personnel carrying response activities to prevent the progression of the radiation accident established in NRB-99/2009?

Answer Allowable level of effective dose of increased exposure 100 mSv specified in NRB - 99/2009 corresponds to the limits given in Table 8 of ICRP publication No.103. Planned increase of exposure group A personnel exceeding specified limits for doses (see table 3.1 of NRB-99/2009) in order to prevent development of an accident or mitigation of its consequences can be permitted only in case of necessity to save people and (or) prevent their overexposure. The planned increase of exposure level is allowed for men older than 30 year only with their voluntary written consent, after informing on possible exposure doses and health risks.

The planned increase of exposure in the effective dose up to 100 mSv/year and equivalent doses not exceeding two-fold values specified in Table 3.1 of NRB-99/2009 can be permitted by organizations (departments) of Federal executive bodies exercising government sanitation and epidemiological surveillance at the level of the Russian Federation subdivision, and exposure in the effective dose up to 200 mSv/year and equivalent doses according to Table 3.1 of NRB-99/2009 can only be permitted by Federal executive bodies authorized to exercise government sanitation and epidemiological surveillance.

Increase of exposure is not allowed:

- for workers, previously exposed during the year in the result of some accident or planned increase of exposure with the effective dose of 200 mSv or equivalent dose that four times exceeded corresponding limits for normal exposure doses specified in Table 3.1 NRB-99/2009;
- for persons with medical contradictions to work with radiation sources.

Persons that were exposed to radiation in the effective dose exceeding 100 mSv during a year shall not be exposed to radiation in the dose more than 20 mSv/year in their subsequent work. Exposure with the effective dose more than 200 mSv/year shall be considered as potentially hazardous. Persons that were exposed to this radiation level should immediately be withdrawn from the radiation zone and undergo medical examination. Subsequent working of these persons with radiation sources can be allowed only on an individual basis considering their consent by the decision of the competent medical board.

Q.No	Country	Article	Ref. in National Report
162	Canada	Article 16.1	Page 94

Question/ As with many countries, the responsibility for different aspects of emergency management and response seem to be shared by different levels or organization from national to local. With the lessons learned from Fukushima, have there been specific changes made regarding alignment and cooperation among the responsible bodies? Have there been joint drills organized that involve all parties, including the national body? Is there a specific level organization that has ultimate authority for emergency management in Russia? Is there cooperation with neighbouring states?

Answer Yes, Russia has a specific level organization that bears the responsibility for emergency

management in Russia – this is the Government Committee for prevention and mitigation of emergency situations and ensuring fire safety.

The total number of 19 ministries and agencies are included in the system of rendering assistance to nuclear power plants in case of radiation hazardous situations, and as a result of cooperation with which no significant changes were made after the Fukushima NPP accident.

Q.No 163	Country China	Article Article 16.1	Ref. in National Report section 16
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Question/ Comment Whether the guide for severe accident management (SAMG) have been developed and implemented at all the NPPs except Balakovo NPP? Are there the differences regarding to the guide form of the different reactor types, how to make choice?

Answer

1. Draft SAMG of every separate energy unit depends on the reactor type, peculiar properties of NPP site and ways of NPP water supply in case of severe accidents.
2. Industrial data are used to develop the guide for SAMG.
3. A standard «guide for severe accident management» (SAMG) has been developed for NPP units working with VVER-1000.

Draft SAMG for NPP units working with VVER are developed on the basis of the standard SAMG guide for NPP units working with PWR-1000 considering special characteristics of every power unit and NPP as a whole.

Guide for SAMG of Balakovo NPP Unit No. 4 has been developed and implemented in 2012.

According to the «updated measures for decreasing consequences of beyond-design-basis NPP accidents», development of draft guides for SAMG for the rest NPP units working with PWR-type reactors will be completed in 2014.

Guides for SAMG on power units working with RBMK, BN and EGP-6 reactor types will be developed in separate documents or as a part of guides for severe accident management in 2015-2016.

Q.No 164	Country India	Article Article 16.1	Ref. in National Report Page 105, Section 16.6
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Question/ Comment What are the important functions of ROSTECHNADZOR -IAC in case of emergency situation at NPPs? What enhancement measures were taken up subsequent to the gaps found in the efficiency analysis of ROSTECHNADZOR?

Answer

In emergency situation Rostechnadzor controls the activity of operating organization on accident elimination and minimizing its effect on the personnel, population and environment. Particularly it controls the accuracy of accident severity estimation and in case of risk (accident of A01-A04 type according to the established classification) a special committee is established to investigate accident reasons and consequences by order from Rostechnadzor. Besides Rostechnadzor is invested with functions of consulting the Russian government on issues related to accident reasons and mitigation status, also providing information to mass media.

All above-mentioned functions during the accident are placed on Rostechnadzor Data Analytical Center with the scientific support SEC NRS.

To improve the efficiency of the IAC in 2013 , the following activities were carried out:

- designed new edition of the Rules of the IAC and its work;
- the modernization of facilities, equipment, communication channels;
- IAC held equipment with new software (domestic and foreign);
- carried conduct rapid assessments on the basis of high-speed codes and accidental release of radionuclides on the ground;
- developed and introduced a guidance document for evaluating the effectiveness of

emergency exercises .

During IAEA post-mission in the 2013 IAC activities was identified as an example of good practice.

Q.No 165	Country Lithuania	Article Article 16.1	Ref. in National Report Page 100
Question/ Comment	Could you please clarify when the emergency plans (on-site plan and off-site plan) for the new NPP in Kaliningrad region will be prepared and approved? Is it intended direct notification system in case of nuclear accident for people situated in emergency preparedness zones, including people of Lithuania?		
Answer	<p>According to Federal Norms and Regulations on Using Nuclear Energy «the standard text of the plan on personnel protection measures in case of NPP accident» (NP-015-12) contains the following requirements:</p> <p>Plan on personnel and population protection measures in case of NPP accident should be developed before nuclear fuel delivery to the NPP Unit No.1 before its physical startup, agreed upon and approved in accordance with the established order and supplied with material and financial resources. It should contain specific characteristics of the reactor plant and the area of NPP location.</p> <p>These plans will be determined the order of public notification in accordance with IAEA recommendations.</p>		
Q.No 166	Country South Africa	Article Article 16.1	Ref. in National Report Page 102
Question/ Comment	<p>Technical Support and Emergency Control Centres: Lessons from Fukushima have identified that facilities needed to implement the severe accident management measures as well as the Emergency Plan should be designed to withstand the potential impact of common mode beyond design external events.</p> <p>Have the safety reassessment performed identified any improvement measures to such facilities? What are the Regulatory requirements/expectations on the robustness of facilities needed for the implementation of EP? Have these requirements being revised following Fukushima?</p>		
Answer	<p>According to the results of stress tests for nuclear power plants to improve the preparedness of NPP management of beyond design basis accidents , in accordance with the articulated RTN additional requirements , designed and implemented a plan that includes, in addition to existing projects the following activities:</p> <ul style="list-style-type: none"> - improving the reliability of external power supply nuclear power plants and internal redundancy ; - providing power supply from emergency portable diesel generators ; - providing NPP containments with hydrogen control and recombination systems (where it is absent) - providing water supply from diesel and water pumps to consumers; - the increase of seismic resistance of equipment and pipelines; - development of emergency instrumentation; - improving the protection of control room, including emergency control room. 		
Q.No 167	Country South Africa	Article Article 16.1	Ref. in National Report 16.2, 95
Question/ Comment	Does Russian have a classification of emergencies per power plant (e.g. Alert, Site, etc)?		
Answer	Yes, Russia has a classification of emergency situations for nuclear power plants.		

Federal norms and regulations on usage of nuclear energy «Provision on the order of announcing an emergency situation, on-line transmission of information and rendering urgent assistance to nuclear power plants in case of radiation hazardous situations» NP-005-98 specifies the following types of condition in case of risk or occurrence of radiation hazardous situation or NPP accident:

- «Emergency preparedness»,
- «Emergency situation».

Q.No 168	Country South Africa	Article Article 16.1	Ref. in National Report 16.1, 94
Question/ Comment	When in the emergency does Russia use the National Crises Management center, and how is it different, in terms of function, from SCC and CC of Rosenergoatom?		
Answer	<p>Yes, National Crisis Management Center (NCMC) of Russian Emergency Committee is used in case of NPP emergency situation.</p> <p>Emergency response system of Rosenergoatom (ERS), operating center of which is CC, provides for carrying out of activities of JSC «Concern Rosenergoatom» to prevent and eliminate emergency situations during the operation of nuclear power plants. ERS consists of the system of emergency prevention and mitigation on auxiliary objects of the Concern nuclear power energy (SEPLAO). ERS in its turn is a part of the functional subsystem of emergency prevention and mitigation of industrial system (FSEP&L) of Rosatom.</p> <p>FSEP&L, operating center of which is Rosatom CSS is included in the Russian Emergency Management System (REMS) as a functional subsystem. Within REMS, FSEP&L intercommunicates with territorial and functional subsystems of REMS. All systems and their centers are operated on the basis of corresponding provisions, activities of which are coordinated and correlated. Thus, in case of NPP emergency the operational response system gets activated, which (if necessary) engages all national emergency protection forces and means.</p> <p>In case of severe NPP accident all crisis centers are activated: NCMC - (National Crises Management Center of Russian Emergency Committee), SCC – (Situation Crisis Center of Rosatom), CC – (Crisis Center of operating organization JSC «Concern Rosenergoatom»), NPP internal and external emergency centers.</p> <p>The difference of the National Crises Management Center (considering its functionality) from SCC, CC, NPP internal and external emergency centers is that NCMC of Russian emergency Committee as a structure organizes coordination and cooperation of regional, district forces and means and is mainly related to the protection of population.</p>		
Q.No 169	Country South Africa	Article Article 16.1	Ref. in National Report 16.4, 102
Question/ Comment	Please indicate the third type of emergency drills and exercises?		
Answer	The third type refers to the group of common plant emergency drills and exercises with elements of fire fighting and mastering the actions of non-standard emergency teams, organized at NPP independently without involvement of OPAS and TSC groups.		
Q.No 170	Country South Africa	Article Article 16.1	Ref. in National Report 16.4, 102
Question/ Comment	Explain the role of Rostekhnadzor during the regular emergency drills and exercises?		
Answer	In case of emergency Rostekhnadzor controls the activity of the operating organization on accident elimination and limiting of its effect to the personnel, population and		

environment. A representative of Rostekhnadzor is included in OPAS group, which goes to NPP during the emergency situation (conventional emergency). Rostekhnadzor particularly controls the accuracy of the accident severity estimation performed by the operating organization and in case of risk (accident of type A01-A04 according to the established classification) issues an order for Rostekhnadzor to establish a special committee to investigate accident causes and consequences. Besides Rostekhnadzor is invested with functions of consulting the Russian government on issues related to accident reasons and mitigation status, also providing information for public (issues press releases, information messages etc.).

All these functions in case of accident are invested to Rostekhnadzor Data Analytical Center with the scientific support of the SEC NRS.

Q.No 171	Country United Kingdom	Article Article 16.1	Ref. in National Report 16.4
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Question/ Emergency drills and exercises are performed on a regular basis. Please provide
Comment information on the role of Rostekhnadzor and any other regulatory bodies in formally assessing these.

Answer In case of emergency Rostekhnadzor controls the activity of the operating organization on accident elimination and limiting of its effect to the personnel, population and environment. Rostekhnadzor particularly controls the accuracy of the accident severity estimation performed by the operating organization and in case of risk (accident of A01-A04 type according to the established classification) issues an order for Rostekhnadzor to establish a special committee to investigate accident causes and consequences. Besides Rostekhnadzor is invested with functions of consulting the Russian government on issues related to accident reasons and mitigation status, also providing information for public (issues press releases, information messages etc.).
All these functions in case of accident are invested to Rostekhnadzor Data Analytical Center with the scientific support of SEC NRS.

Q.No 172	Country United Kingdom	Article Article 16.1	Ref. in National Report 16.1
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Question/ §16.1 lists the regulatory documents for emergency preparedness and §16.2 describes how
Comment these are implemented for the operator, but provides very little detail of the off-site response. Please provide further details of the organisation and decision making process for the off site response.

Answer According to guiding documents, Federal norms and regulations effective in Russia:
- The Federal law No. 68-FZ dated 21 December, 1994 «Protection of population and territories from natural and anthropogenic emergencies»;
- Provision on the unified national system of emergency prevention and mitigation, approved by the Russian government regulation No. 794 dated 30 December, 2003;
- The Federal law No. 170-FZ dated 21 November, 1995 «Using of nuclear energy»;
- «Standard text plan on personnel protection measures in case of NPP accident» (NP-015-12) and issues of emergency planning and response are separated. Thus, NPP and SPZ are under the responsibility of the operating organization, and organizational measures on protection of personnel and territories beyond SPZ are in the sphere of regulatory bodies of municipal formations (town near NPP) and constituent entity of the Russian Federation (district), where NPP is located.
«Plan of personnel protection measures at NPP» and «Plan on personnel protection measures in case of NPP accident», which were developed considering recommendations of the Russian Emergency Committee on planning of activities on prevention and mitigation of emergency situations on facilities are coordinated and correlated.

Decision on implementation of «Plan on personnel protection measures in case of NPP accident» specifying all aspects of personnel and territory protection shall be taken by the head of municipal formation (town near NPP) or constituent entity of the Russian Federation (district), where NPP is located, using recommendations of NPP Emergency Work Manager (Director).

Q.No 173	Country China	Article Article 16.2	Ref. in National Report section 16.5
Question/ Comment	How to implement the communication between Russian NPP emergency organization and technical support centre of WANO Moscow centre? What is main content of the support agreement?		
Answer	<p>Considering recommendations provided by the 2nd Post-Fukushima Committee and decisions of WANO Moscow center seminar dated 30 August, 2011 on holding stress tests it was decided to create a Regional Crisis Center of WANO Moscow center (RCC) on the basis of JSC «Concern Rosenergoatom» Crisis Center (CC).</p> <p>Emergency centers of Russian NPPs coordinate the cooperation with them, and in this regard within RCC there appeared an additional possibility to request support from other RCC member countries, if necessary.</p> <p>Agreement to render support provided for the following:</p> <ul style="list-style-type: none"> - organization of expert / consultation and engineering and technical support in case of emergency inside NPP site or general emergency at NPP using PWR reactor plant; - spreading the information on safety-related NPP events among own members; - forming of unified information and expert space. 		
Q.No 174	Country Japan	Article Article 16.2	Ref. in National Report p100
Question/ Comment	Improvement measures to support the emergency preparedness in the light of lessons learned from Fukushima NPP mainly explains increase of drills and communication systems.		
Answer	<p>Could you explain how many staff are increased for a NPP site as improvement measures?-</p> <p>(For example, are the enhancement of OPAS (page 98) and/or the emergency response system shown as Figure 16.2 (page 97) implemented?</p> <p>Considering the increase of drills and improvement of communication system to ensure emergency preparedness of Russian NPPs after the accident at Fukushima-Daiichi NPP in 2012 it was decided to create the 8th (eighth) shift of operating personnel on critically important positions.</p> <p>To provide maintenance of equipment, purchased and commissioned at Russian NPPs in compliance with «Measures on minimizing consequences of beyond-design-basis accidents», the quantity of personnel was increased by 2 positions for each power unit. The structure and quantity of the group for rendering assistance to nuclear power plants (OPAS) was not changed.</p>		
Q.No 175	Country Poland	Article Article 16.2	Ref. in National Report Article 14.2, 16.2 and 16.5
Question/ Comment	As mentioned in sec. 14.2, apart from the «centralized group for assistance to NPPs (OPAS)» aimed at providing «corporate support and give recommendations in case of emergencies» there are Technical Support Centers (TSC) that are meant in the Russian national report as external (off-site) centers set up by 14 organizations to provide support		

to any NPP in case of emergency.

In addition, as it follows from sec. 16.5, there are also regional Emergency Technical Centers (ETC) – currently (after integration) only two: in St. Petersburg and Novovoronezh. However, their role has not been described in the National Report, except of mentioning that «The Novovoronezh ETC is the nuclear industry’s emergency technical centre for assisting NPPs in emergencies.»

But what about on-site Technical Support Centers that are meant as dedicated facilities (a properly equipped room at each power unit) to be utilized by a technical support team to provide support in case of emergency to the operating staff to prevent or manage and control/mitigate accidents (as required in the IAEA safety requirements draft document DS462, Requirement 67) and on-site Emergency Operations Centers (dedicated facilities to be utilized for managing emergency response actions on-site and providing liaison with off-site emergency response organizations)?

Answer Emergency Technical Centers (ETC) located in St. Petersburg and Novovoronezh are designated to perform the whole complex of emergency technical and rescue operations in conditions related to the radiation factor, using robotic tools, remotely controlled machines and mechanisms, emergency tools and equipment, special equipment.

ETCs are mobile facilities going to the emergency NPP by order of manager of the group of rendering assistance to NPPs (OPAS) after receiving agreement from the state corporation «Rosatom».

All Russian NPP sites are quipped with on-site emergency operations centers (OEOC) – emergency centers. OEOC is designated for the operation of NPP emergency and fire safety management committee and rendering support to operating shift personnel during the emergency management. NPP EMS are equipped with all kinds of communication means (telephone, cellular, satellite, radio communication means, Internet, email, fax, video conference etc.) for communication with off-site participants of emergency response groups, also in case of NPP blackouts.

Technical support centers (TSC) (14 organizations) created on the basis of technical support organizations of JSC «Concern Rosenergoatom» are located in cities (Moscow etc.) rendering support to «Rosatom» situation crisis centers and REA CC in estimation of the accident status and taking measures on its mitigation.

Q.No	Country	Article	Ref. in National Report
176	Poland	Article 16.2	p. 98,102

Question/ Comment 1. Is there a defined by the law obligatory frequency for off-site exercises?
2. Does the CED play role of the off-site emergency exercise?

Answer 1. Yes, there is.

According to organizational instructional guidelines on organizing of off-site exercises for regulatory bodies, civil defense forces and unified emergency prevention and mitigation system for 2014-2016, approved on 10.09.2013 by Russian Minister of Civil Defense, Emergency Situation and Mitigation of Natural Disaster Aftermaths (Russian Emergency Committee), levels, terms and frequency of such exercises have been specified in details:

- for Federal authorities;
- for executive authorities of Russian constituent entities;
- for local authorities.

Drills and exercises on performing tasks related to population and territory protection from natural and anthropogenic emergencies, including those caused by acts of terrorism, shall be performed with the frequency and duration specified in a certain order of Russian government No. 577 dated 04.09.2003 «Preparedness of population considering natural and anthropogenic emergency protection».

2. Every year on one of nuclear power plants forces of Russian Emergency Committee of

Federal, regional and local levels, forces and units of the Ministry of Defense are engaged in off-site emergency exercises. Such exercises are scheduled with practicing of information communication, annunciation, coordination and cooperation of forces and facilities of ministries and institutions participating in exercises.

Q.No 177	Country South Africa	Article Article 16.2	Ref. in National Report 16.3, 100
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Question/ Comment What facilities are used to inform the public in the vicinity of nuclear installations about emergency planning and emergency situations in Russia?

Answer According to the order of the Nuclear Energy Federal Agency No.82 dated 19 February «Organization of message preparation and public information in case of events that have an effect on safety of functioning of organizations controlled by Rosatom» in case of risk or events that have an effect to safety, and switching to «Increased preparedness» mode or «Emergency» mode, the overall coordination of informing citizens and organizations on activities of Rosatom, public information and cooperation with mass media shall be performed:

- on a Federal level - Corporate Emergency Prevention and Mitigation Committee of Rosatom (hereinafter referred to as - CEP&LC);

- on a local level (in organizations and their affiliated branches) – Emergency Prevention and Mitigation Committee (hereinafter referred to as - EP&LC).

Rosatom Press Secretary is included in CEP&LC, and managers of public relations services (Press Services) in organizations subordinate to Rosatom are included in EP&LC. Workers responsible for preparation of messages for mass media are included in expert groups of Rosatom CEP&LC and EP&LC formed in accordance with the established order.

In case there occur events having an effect to safety, Rosatom Press Service, Department of Information and Public Relations of the Concern and NPP PIC cooperate within FSEP&L on a Federal and local levels in order to coordinate activity and mutual information support while providing public information.

Rostekhnadzor ensures consulting the Government related to the causes and restriction of accident, as well as informing the public (press releases, newsletters, etc.). All of these features in the accident assigned to RTN IAC with the support of its TSO SEC NRS.

Q.No 178	Country Switzerland	Article Article 16.3	Ref. in National Report 16.6, p. 104
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Question/ Comment The report states that one of the objectives pursued by Rostekhnadzor in its inspection activities is to check the condition of sheltered stations for controlling the accident management operations. Do all NPPs in the Russian Federation dispose of «sheltered station for accident controlling»?

Do all NPPs in the Russian Federation dispose of «sheltered station for accident controlling» and what are the requirements with respect to habitability and dimensioning against external events like earthquakes and extreme flooding?

Answer Requirements to availability of sheltered accident management station at Russian NPP are specified in NP-001-97 (GSP 88/97) «General provisions on ensuring NPP safety». According to item 5.5.5 of the above-mentioned normative document, internal and external emergency centers should be established and maintained in the mode of constant readiness before delivery of nuclear fuel to NPP. These centers should be equipped with required equipment, devices and communication means to monitor the implementation of personnel protection plans in case of emergency. Requirements to the protection level from environmental loads are also specified in NP-001-97.

Item 4.1.5 of the above-mentioned normative document indicates that systems (elements), important to safety (including emergency management centers) should be able to perform their functions in the designed volume considering effects of natural acts (earthquakes, hurricanes, floods potentially possible within NPP site), external industrial events, characteristic of the selected NPP site and/or during potential mechanical, heat, chemical and other effects of design-basis accidents. Requirements to life-support of the mentioned items are specified in item 5.5.5 of NP-001-97: «... equipped with required equipment, devices and communication means...» and in item 11.1.5 of SP AS-03: «...equipped with communication systems, radiation monitoring instruments, watching facilities, personal protection means for personnel and delivery of first aid. Centers should have plans and instructions for personnel actions in case of accident».

According to Federal norms and rules on usage of nuclear energy (GSP-88/97, NP-015-12 etc.), sheltered emergency centers were created at all nuclear power plants of JSC «Concern Rosenergoatom» in order to provide management in case of radiation accident. Sheltered constructions are earthquake-resistant objects, and they can withstand earthquake of any severity. These constructions are quipped with the following backpack life-support systems: power supply, water supply, air supply with the mode of full insulation.

These sheltered constructions are designed to be located in regions (areas) of catastrophic (extreme) flooding.

FYI: nuclear power plants of JSC «Concern Rosenergoatom» are located away from earthquake and catastrophic flooding areas.

Q.No 179	Country Switzerland	Article Article 16.3	Ref. in National Report 16.6, p. 105
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Question/
Comment The report states that the Information and Analysis Centre (IAC) supports, among others, online communication between Rostekhnadzors central staff and NPPs. Within this online communication or in connection with the Crisis Centre of Rosenergoatom, is an automatic data transfer of NPPs operational and safety parameters also intended?

Do the crisis centres (e.g. of the IAC of Rostekhnadzor or of the Rosenergoatom) dispose of a communication link for an automatic data transfer of NPPs operational and safety parameters and/or how are such plant parameters transmitted to the crisis centres during an emergency?

Answer Yes, the Crisis Center (CC) of JSC «Concern Rosenergoatom» and the information and Analysis Center (IAC) of Rostekhnadzor have an operating communication channel, providing both videoconferencing with CC, fourteen technical support centers (TSC), SCC of Rosatom and all nuclear power plants, and transferring of process and radiation parameters of all Russian NPP power units on a real time basis.

In case of NPP accident or emergency all participants of emergency response (CSS of Rosatom, CC of JSC «Concern Rosenergoatom», IAC of Rostekhnadzor, 14 technical support centers) work with nuclear power plants in a unified information space on a real time basis. It means that they cooperate with each other using videoconferencing, receive real (process and radiation) information from NPP unit computer systems and process recommendations on mitigation, localization and mitigation of NPP deviations.

According to these data, SEC NRS experts, members of the working groups of the emergency response in the IAC during the drills conducted rapid calculations using high-speed codes for independent assessment of the accident and assess the appropriateness of actions EO during an emergency.

Q.No 180	Country Belarus	Article Article	Ref. in National Report info for Article 17
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		17.1	
Question/ Comment	Which regulations on siting of nuclear power plants are planned to be amended based on the accidents at the «Fukushima - Daiichi» plant in Japan?		
Answer	Currently a number of Federal norms and regulations on using nuclear energy are being reviewed «General provisions of ensuring NPP safety» NP-001-97, «Location of nuclear power plants. Basic criteria and requirements on ensuring safety» NP-032-1, «Design standards for seismic resistant nuclear power plants» NP-031-01, «Consideration of external natural and anthropogenic effects to nuclear power energy objects» NP-064-5. Reviews should consider lessons learnt from the analysis of the accident at the Fukushima-Daiichi plant.		
Q.No 181	Country Bulgaria	Article Article 17.1	Ref. in National Report p. 108
Question/ Comment	The report mentions that one of the external events according to design of new NPPs is the impact of a light airplane crash (weight of 5 tones). Could Russia provide information on the plans to modify the requirement in respect of a large airplane crash?		
Answer	<p>New projects of NPP (VVER-TOI) provide for the following:</p> <ul style="list-style-type: none"> - impact from aircraft Phantom RF-4E weighing 20 tons at a speed of 215 m/s as a design initial event. For such an event design provides for safety all requirements on a conservative basis; <p>As an initial event beyond the design basis an impact from aircraft Boeing 747-440 weighing 400 tons at a speed of 150 m/s is provided for considering fuel ignition. For such an event the design guarantees that there will not be a release of radioactive substances into environment.</p>		
Q.No 182	Country Bulgaria	Article Article 17.1	Ref. in National Report p. 109
Question/ Comment	In the report is indicated that one of the measures to manage beyond design basis accidents is the availability of an alternating (mobile) DG. Could Russia clarify if there is a requirement that such a DG be placed in a bunkerred structure?		
Answer	<p>Currently Russian normative documents lack requirements for compulsory equipping with NPP emergency portable facilities, and requirements for conditions of their location. Consequently, these issues are managed by NPP operating organization and designers. The issue of locating mobile DG in sheltered or bunker constructions is open for discussions, because it requires meeting of requirements to seismic resistance, which probably exceed design requirements to durability, excluding the possibility of bunker flooding.</p> <p>For example, the following measures related to locating portable emergency diesel generators were performed in Russian nuclear power plants working with PWR reactors:</p> <ul style="list-style-type: none"> - diesel-generators are located at NPP sites near NPP main buildings in safe places considering flooding and falling of adjacent buildings; - diesel-generator should immediately be connected to NPP emergency power supply system using cables, because in case of emergency it should instantly be put into operation in order to prevent the transition of design-basis accident to beyond-design-basis accident and recharging of accumulator battery, the discharge time of which differs at different power units (making approximately 1-3 hours); - in case of emergency there should be a possibility to transport diesel-generators from one NPP unit to another emergency unit, i.e. if the emergency unit diesel-generator fails; - diesel-generator is mounted on a platform in the outdoor shielding container. <p>Currently a new version of GSP-88/97 (NP-001-97) has been developed. According to the new version of the document, all specific facilities designed for mitigation of beyond-</p>		

design-basis accidents refer to safety-related equipment and they should have a safety class 3, which means special conditions of storage, servicing, testing ensuring preparedness for putting into operation.

Q.No	Country	Article	Ref. in National Report
183	Canada	Article 17.1	Page 107
Question/ Comment	The report describes how the site impacts on the design and operation of the NPP such as seismic and flooding. How does the siting assessment consider the impact of the facility on the site, including environmental impact? How is environmental assessment considered in the site evaluation? How are the site evaluation and environmental assessment, and their impacts considered on an ongoing basis during the life cycle of the NPP?		
Answer	<p>Federal normative document SP 11-102-97 (a set of rules on «Engineering and ecological surveys for construction») has been developed on the basis of principles of integrated assessment of construction environmental impact and exposure to the environment to construction, including living conditions of population. Recommendations specified in this document contain requirements to criteria, characteristic values and procedures ensuring environmental safety of construction, environment conservancy and protection. According to requirements of this document a preliminary qualitative forecast of possible environmental changes shall be provided already at pre-investment stage during the implementation of the planned activity, including negative consequences (environmental risk).</p> <p>A set of rules SP 47.13330.2012 «Engineering survey for construction. General provisions» (Federal level document) provides for that engineering and environmental survey for choosing a site for new construction shall be carried out to determine environmental possibilities to locate the designed facilities. Survey should be performed in the volume, which is required to assess the possibility of the designed facility effect on the environment and select a site of higher priority. Principal activities include: collecting, processing and analysis of published and stored materials and data on the environmental condition; searching of similar facilities functioning in analogous natural conditions; environmental interpretation of air and satellite photos using different exposure types. The result of engineering and environmental survey is engineering and environmental map showing territories subject to risk of natural and anthropogenic emergencies, specially protected natural areas and environment risk territories.</p> <p>Considering the planned activity related to construction of nuclear energy source, which can have an direct or indirect effect on the environment, according to requirements of the Federal law «Environment protection» an assessment of environmental effect shall be performed at all NPP design cycles. To meet the requirements to the environment protection specified in the design documentation a state environment impact assessment of materials substantiating the planned activity on using the nuclear energy shall be performed.</p> <p>To exclude negative effect of nuclear facilities on the environment and exposure of nuclear facilities to the environment at all stages of NPP lifecycle a regular integrated monitoring of site and environmental parameters shall be carried out. According to requirements of SP 11-102-97, a monitoring program is being developed, which will specify types of monitoring (subsurface, hydrogeological and hydrological monitoring, monitoring of atmospheric air, ground and geochemical, phyto-monitoring, monitoring of ground and water inhabiting organisms), list of monitored parameters, location of survey points in space, methods for all types of surveys; frequency, time mode and duration of surveys, normative-technical and metrological assurance of surveys.</p> <p>According to the Federal law «Environment protection» for nuclear facilities there should be established a number of normative standards for radiation and chemical influencing</p>		

factors on environment components (discharges, releases, limits for waste disposal), observance of which is controlled within the production and state control performed during the NPP operation.

Q.No 184	Country Euratom	Article Article 17.1	Ref. in National Report page 107
Question/ Comment	<p>It is planned to construct the Kaliningrad NPP in the north-eastern part of the Kaliningrad region, in the area of Neman bordering European Union. The information about site selection and consideration of alternatives for Kaliningrad NPP is not described in the National Report of the Russian Federation.</p> <ul style="list-style-type: none"> - Could you specify the criteria used for selecting this particular part of the Kaliningrad region as the most suitable location for construction of the nuclear power plant, what actions were taken during the site selection procedure and assessment of locational alternatives? - Could you specify what exclusion criteria were used for the sites? - What is the common size (radius) of the region in which the investigations are conducted in order to assess geological and seismic hazards on the sites? - Was the fact that strong earthquake took place in Kaliningrad region in 2004 taken into account while performing the seismic analysis? 		
Answer	<p>Criteria of siting were accepted according to requirements of normative documents NP-032-01 «Location of nuclear power plants. Basic safety criteria and requirements», NP-031-01 «Design rules for seismic resistant nuclear power plants» and NP-064-05 «Consideration of external natural and anthropogenic effects to nuclear power energy objects».</p> <p>The following IAEA instructions were used for site assessment in Kaliningrad region:</p> <ul style="list-style-type: none"> - IAEA safety instruction No.50-C-S, Rev.1 «Set of NPP safety regulations. Selection of NPP sites»; - IAEA safety instruction NS-G-3.1 «External industrial events in NPP site assessment»; - IAEA safety instruction NS-G-3.6 «Geotechnical assessment aspects for NPP foundation sites». <p>Detailed information on site selection and assessment of alternatives is provided in the report «NPP-2006. Justification of investments in the construction of Baltic NPP. Vol. 2. Unit location. Book 1.- State corporation «Rosatom», 2009».</p> <p>According to requirements of NP-032-01, nuclear power plants are not allowed to be located:</p> <ul style="list-style-type: none"> - on sites located immediately on active faults; - on sites, seismic activity of which is characterized with MCE intensity more than 9 points according to ÎSÊ-64 scale; - on the territory, which is not forbidden for NPP location by environmental legislation. <p>According to requirements of item 2.1 of NP-006-98 «Requirements to contents of the report on safety substantiation of NPP working with PWR reactors» it is necessary to observe the following area radii values, taking the reactor compartment as a center of NPP site:</p> <ul style="list-style-type: none"> - region, not less than 300 km; - point, not less than 30 km; - site, not less than 3 km. <p>The earthquake factor in the Kaliningrad region, which occurred in 2004 was taken into consideration.</p>		
Q.No 185	Country Euratom	Article Article 17.1	Ref. in National Report page 107

Question/ Comment	<p>Following the provision of item 2.26 of International Atomic Energy agency Safety Requirements document No. NS-R-3 «Site Evaluation for Nuclear Installations», «The proposed region shall be studied to evaluate the present and foreseeable future characteristics and the distribution of the population of the region. Such a study shall include the evaluation of the present and future uses of land and water in the region and account shall be taken of any special characteristics that may affect the potential consequences of radioactive releases for individuals and the population as a whole.»</p> <p>Have a study or calculations been carried out with regard to the distribution of population in the region of the Kaliningrad NPP under construction and the radiological risk to the population associated with accident conditions, including those that could lead to emergency measures being taken?</p>		
Answer	<p>Required investigations and calculations were performed within engineering and environmental surveys in order to justify investments into the construction of the Baltic NPP. Results of investigations and calculations are specified in materials of the environment impact assessment procedure. For sites located in the vicinity of bordering countries, considering specifically the Baltic NPP, a comprehensive independent partnership review of materials on environment impact assessment procedure is performed regularly. For example, in 2012-2013 commissioned by IAEA GRS (Germany) has reviewed some of the issues of design safety NPP-2006 project, including the EIA for the Baltic nuclear power plant to meet the safety requirements of the IAEA.</p>		
Q.No 186	Country Euratom	Article Article 17.1	Ref. in National Report page 107
Question/ Comment	<p>It is stated, that «Selection of a nuclear plant site and its acceptance as suitable for construction and safe operation of the nuclear plant are regulated by federal laws, federal nuclear rules and regulation».</p> <ul style="list-style-type: none"> - Do these regulations and requirements reflect the IAEA safety requirements for site selection? - Are there any plans to invite IAEA Site and External Events Design Review Mission for selected sites within the Russian Federation? 		
Answer	<p>Yes, Russian normative documents specifying issues on site selection were developed considering requirements of IAEA standards.</p> <p>Russian Federal laws, including Federal norms and rules for nuclear energy usage, as a rule are based on IAEA safety requirements to site selection. Deviations from requirements of IAEA norms occur in cases when national norms contain more stringent requirements or when requirements deal with procedure or organizational issues.</p> <p>For sites located in the vicinity of bordering countries an integrated independent partnership review of materials on environment impact assessment procedure is carried out. Regarding design safety issues, the project of NPP-2006 was considered for compliance with IAEA safety requirements in 2012-2013 (service of IAEA GRSR). Therefore IAEA Site and External Events Design Review Mission (SEED) will hardly add something new to the assessment of the Baltic NPP site.</p> <p>As for other sites, the decision to invite IAEA Site and External Events Design Review Mission to selected Russian sited was not taken considering that this type of missions was proposed by IAEA to member-countries quite recently (in the end of 2012).</p>		
Q.No 187	Country Euratom	Article Article 17.1	Ref. in National Report page 108
Question/ Comment	<p>The federal standards and rules NP-064-05 state that the following should be ensured for each newly designed NPP at low values of the external impact intensity (hazard degree III is the lowest one) adopted in the design basis.</p>		

	Is an Adaptation of the safety requirements for new power plants fore seen for the existing operational one when extending the life time or performing Periodic Safety Reviews?		
Answer	<p>Extending NPP lifetime and carrying out of periodical safety evaluation considers the observation of currently effective norms and rules for nuclear energy usage, including issues on environmental load protection. Observance of those requirements of norms and rules should not be evaluated if they refer to only newly designed (constructed) nuclear power plants.</p> <p>The national report specifies all regulatory requirements that related to consideration of external natural and anthropogenic effects on NPP. According to requirements of Federal norms and rules NP-064-05 «Consideration of external natural and anthropogenic effects to nuclear power energy objects», design external natural effects with periodicity of one time every 10000 years should be reviewed, including external industrial effects with probability of 10E-6 once a year. The specified requirements applied both to constructed and existing nuclear power plants.</p>		
Q.No 188	Country France	Article Article 17.1	Ref. in National Report § 17 - p. 108
Question/ Comment	Russian Federation does not mention climatic hazards (extreme temperature) and hazards related to ultimate heat sink (ice, low flows...) concerning the design basis. As the frequency of beyond design basis accidents (BDBA) based on external hazards is very low (less than 10 ⁻⁶ /year), could Russian Federation present the methodology and the protections designed to protect against these hazards?		
Answer	<p>Article 17 of the National report lists extreme environment loads, the resistance of Russian power units to which is proved. It also specifies additional technical means for BDBA management introduced on constructed and designed nuclear power plants. In particular, for the Kola NPP units as short-term measures to be completed:</p> <ul style="list-style-type: none"> - Analysis of the effect of low temperatures on the regulatory repeatability on chemically demineralized water tanks outside buildings; - justification of strength when exposed to extreme snow loads (4.6 kPa) on buildings and structures that are important for safety and designed for a snow load of 2 kPa with the adoption, if necessary, according to the analysis of measures to strengthen constructions. 		
Q.No 189	Country France	Article Article 17.1	Ref. in National Report § 17 - p. 109
Question/ Comment	Russian Federation presents the lessons of the Fukushima Daiichi NPP accident and announces the assessment of building and structure stability as «important for safety» during an earthquake equal to 1.4 Safe Shutdown Earthquake (SSE). Could Russian Federation specify if SSE is the design value and how the margin of 0.4 was determined? Seismically non-qualified components may also threaten «important for safety» items if these non-qualified items are poorly anchored and close to safety related items. Does Russian Federation request the licensees to assess the vulnerability of safety related components due to their proximity to non-qualified items?		
Answer	<p>SSE is a design value. The project of NPP PWR-TOI apart from other BDBA also includes consideration of 1,4SSE earthquakes. Value of 1,4SSE was accepted for seismotectonic conditions of Russian NPP sites as the expert level earthquake. The similar estimation of the seismic resistance margin complies with EUR recommendations.</p> <p>The license-holder shall perform vulnerability analysis of safety-related elements, considering their closeness to non-seismic resistant equipment units. NPP components shall be designed so that failure of low seismic resistance components would not cause failure or destruction of high seismic resistance components (NP-031-01 «Location of nuclear power plants. Basic criteria and requirements on ensuring safety»).</p>		

The value of so called seismic load beyond design basis specified in the design shall ensure compliance with the criteria of the large emergency emission possibility.

Q.No 190	Country Japan	Article Article 17.1	Ref. in National Report p109
Question/ Comment	Reassessment of robustness of existing plants are explained in section 6.2, In Article 17, it is explained that Additional improvements against external impacts are analyzed for existing NPPs, those under design and construction. Are those two assessments for existing plants and for those under design and construction implemented with the similar basic requirements?		
Answer	Yes, requirements to existing plants and those under design and construction are the same regarding stress tests.		
Q.No 191	Country Korea, Republic of	Article Article 17.1	Ref. in National Report 108-109
Question/ Comment	What are the detailed technical bases, especially the values, of a) the wave pressure of not less than 10 kPa, and the compression phase time of up to 1 sec, b) external fires of less than 90 minutes of a standard fire, and c) the impact load less than that of a light aircraft crash (5 tons of weight)?		
Answer	The mentioned values comply with requirements of still effective Russian norms PiN AE-5.6 «Structural design norms with reactors of different types» and NP-064-05 «Consideration of external natural and anthropogenic effects to nuclear power energy objects». After the accident in Fukushima these and some other norms are to be reviewed.		
Q.No 192	Country Korea, Republic of	Article Article 17.1	Ref. in National Report 108-109
Question/ Comment	Why do you use an earthquake equal to 1.4 time of SSE for the specific site as a beyond basis accident? Is there any detailed technical basis?		
Answer	1,4 SSE was accepted for seismotectonic conditions of Russian NPP sites as the expert level earthquake. The similar estimation of the seismic resistance margin complies with EUR recommendations.		
Q.No 193	Country Korea, Republic of	Article Article 17.1	Ref. in National Report 108-109
Question/ Comment	Are there any NPP monitoring systems operated by either the utility or the regulatory body for site characteristics, such as earthquakes, surface faulting, groundwater elevation, slope failures, foundation subsidances etc., and are these information open to the public, if any?		
Answer	Industry Center of Resource Monitoring carries out a local resource monitoring in enterprises and organizations of State corporation «Rosatom». Local resource monitoring covers all existing nuclear power plants. Other monitoring activities are performed by operating organization of JSC «Concern Rosenergoatom» in regions and on sites of existing nuclear power plants using individual programs developed considering design decisions for a specific NPP, peculiarities of natural and anthropogenic site conditions. Public information is provided in the course of preparation to public discussions of environment impact assessment procedures and during immediate discussions in the format of round table meetings and meetings with ecologists, representatives of regulatory bodies and other target audiences. This information is also open to Press. Regulatory body does not have own monitoring systems at NPP. Programs and results of monitoring are specified in safety analysis reports (SAR) submitted by operating		

organization for the expert review.

Q.No 194	Country Lithuania	Article Article 17.1	Ref. in National Report Page 107 - 110
Question/ Comment	The sitting of the NPP in the Kaliningrad region is not described in the National Report. Could you please provide information on selection criteria used for site of the NPP in Kaliningrad region? What actions were taken by selecting particular site and assessing alternative sites? On what results of surveys and researches was based exclusion of the alternative sites for the NPP in Kaliningrad region? Do you consider in seismic analysis quite strong earthquake happened in Kaliningrad region in 2004? What is the current implementation status of this project and schedule of further activities regarding project?		
Answer	<p>1. Criteria for NPP site selection were accepted according to requirements of normative documents NP-032-01 «Location of nuclear power plants. Basic safety criteria and requirements», NP-031-01 «Design rules for seismic resistant nuclear power plants» and NP-064-05 «Consideration of external natural and anthropogenic effects to nuclear power energy objects».</p> <p>The following IAEA instructions were during the assessment of the site in Kaliningrad region:</p> <ol style="list-style-type: none"> 1. Safety standards series №. NS-G-1.5. External events excluding earthquakes in the design of nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003. 2. Safety standards series №. NS-G-3.1 External human induced events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2002. 3. Safety standards series №. NS-R-3 Site Evaluation for Nuclear Installations. Safety requirements. International atomic energy agency. Vienna, 2003. 4. IAEA safety standards series №. NS-G-1.13 Radiation protection aspects of design for nuclear power plants International atomic energy agency Vienna, 2005. 5. Safety standards series №. NS-G-3.4 Meteorological events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003. 6. IAEA safety standards series №. SSG-9. Seismic hazards in site valuation for nuclear installations. Specific safety guide. International atomic energy agency. Vienna, 2010. 7. IAEA safety standards series №. NS-G-3.6 Geotechnical aspects of site evaluation and foundations for nuclear power plants . Safety guide. International atomic energy agency. Vienna, 2004. <p>The fact of the earthquake in the Kaliningrad region, which took place in 2004, was taken into account in the design.</p> <p>2. According to the scheme of territorial planning of the Russian Federation in the field of energy (approved by RF Government Decree of 11.11.2013 № 2084-p), the construction of nuclear power plant in Kaliningrad Region is not planned till 2030.</p>		
Q.No 195	Country Lithuania	Article Article 17.1	Ref. in National Report Page 107 - 110

Question/
Comment Could you please describe consistency of site selection process with IAEA safety standards? What IAEA safety standards relevant to sitting were used during site evaluation of new NPP in the Kaliningrad Region?

Answer Rostekhnadzor carries out oversight of observance of safety standards in accordance with Federal standards and rules (FSR) which together with Russian experience are accounted in the international operating experience reflected in IAEA standards. Specifically, the following IAEA standards are taken into account at site selection process:

1. Safety standards series №. NS-G-1.5. External events excluding earthquakes in the design of nuclear power plants. Safety guide. International atomic energy agency. Vienna,

2003.

2. Safety standards series №. NS-G-3.1 External human induced events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2002.
3. Safety standards series №. NS-R-3 Site Evaluation for Nuclear Installations. Safety requirements. International atomic energy agency. Vienna, 2003.
4. IAEA safety standards series №. NS-G-1.13 Radiation protection aspects of design for nuclear power plants International atomic energy agency Vienna, 2005.
5. Safety standards series №. NS-G-3.4 Meteorological events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003.
6. IAEA safety standards series №. SSG-9. Seismic hazards in site valuation for nuclear installations. Specific safety guide. International atomic energy agency. Vienna, 2010.
7. IAEA safety standards series №. NS-G-3.6 Geotechnical aspects of site evaluation and foundations for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2004.

When receiving license for placement of Baltic NPP, Rostekhnadzor was verifying compliance of the chosen site with FSR requirements, including listed IAEA standards in part of atomic power plants placement.

Q.No	Country	Article	Ref. in National Report
196	Lithuania	Article 17.1	Page 107
Question/ Comment	<p>It is stated, that «Selection of a nuclear plant site and its acceptance as suitable for construction and safe operation of the nuclear plant are regulated by federal laws, federal nuclear rules and regulation.»</p> <p>Could you please clarify if these documents reflect IAEA safety standards for site selection? Have you foreseen to host IAEA Site and External Events Design Review Mission for selected site in the Kaliningrad Region?</p>		
Answer	<p>Rostekhnadzor carries out oversight of observance of safety standards in accordance with Federal standards and rules (FSR) which together with Russian experience are accounted in the international operating experience reflected in IAEA standards. Specifically, the following IAEA standards are taken into account at siting process:</p> <ol style="list-style-type: none"> 1 Safety standards series №. NS-G-1.5. External events excluding earthquakes in the design of nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003. 2 Safety standards series №. NS-G-3.1 External human induced events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2002. 3 Safety standards series №. NS-R-3 Site Evaluation for Nuclear Installations. Safety requirements. International atomic energy agency. Vienna, 2003. 4 IAEA safety standards series №. NS-G-1.13 Radiation protection aspects of design for nuclear power plants International atomic energy agency Vienna, 2005. 5 Safety standards series №. NS-G-3.4 Meteorological events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003. 6 IAEA safety standards series №. SSG-9. Seismic hazards in site valuation for nuclear installations. Specific safety guide. International atomic energy agency. Vienna, 2010. 7 IAEA safety standards series №. NS-G-3.6 Geotechnical aspects of site evaluation and foundations for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2004. <p>When receiving license for siting of Baltic NPP, Rostekhnadzor was verifying compliance of the chosen site with FSR requirements, including listed IAEA standards in part of NPP siting.</p> <p>For the sites located in the vicinity of neighboring countries full independent peer review of EIA (environmental impact assessment) is carried out. Regarding design safety issues,</p>		

review of AES-2006 project for compliance with IAEA safety requirements was carried out in 2012-2013 (GRSR service of IAEA). When it comes to the other Sites, decision on inviting IAEA mission to selected sites in Russia to review Site and External Events Design (Site and External Events Design Review Mission) hasn't yet been made in view of the fact that such type of missions was offered to countries-participants by IAEA relatively recently (in the end of 2012).

Q.No 197	Country Luxembourg	Article Article 17.1	Ref. in National Report section 17
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Question/ Comment Please explain what IAEA safety requirements and appropriate safety guides were used during the site evaluation process in the Kaliningrad Region?

Answer Rostekhnadzor carries out supervision of observance of safety standards in accordance with Federal standards and rules (FSR) which together with Russian experience are accounted in the international operating experience reflected in IAEA standards. When placing Baltic NPP apart from Russian standards the following IAEA standards were taken into account:

- 1 Safety standards series №. NS-G-1.5. External events excluding earthquakes in the design of nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003.
- 2 Safety standards series №. NS-G-3.1 External human induced events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2002.
- 3 Safety standards series №. NS-R-3 Site Evaluation for Nuclear Installations. Safety requirements. International atomic energy agency. Vienna, 2003.
- 4 IAEA safety standards series №. NS-G-1.13 Radiation protection aspects of design for nuclear power plants International atomic energy agency Vienna, 2005.
- 5 Safety standards series №. NS-G-3.4 Meteorological events in site evaluation for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2003.
- 6 IAEA safety standards series №. SSG-9. Seismic hazards in site valuation for nuclear installations. Specific safety guide. International atomic energy agency. Vienna, 2010.
- 7 IAEA safety standards series №. NS-G-3.6 Geotechnical aspects of site evaluation and foundations for nuclear power plants. Safety guide. International atomic energy agency. Vienna, 2004.

Q.No 198	Country South Africa	Article Article 17.1	Ref. in National Report Page 107
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Question/ Comment Please indicate how the sizes of the emergency planning zones are determined?

Answer In NP-032-01 «Location of nuclear power plants. Main criteria and requirements to safety assurance» the following definition of area of protective measures planning is given: territory around nuclear power plant, within which radiation impact is possible during beyond design basis accidents, and measures of public protection stipulated by effective radiation safety standards are planned. Beyond this area execution of public protection measures are not required for the above-mentioned accidents. In i. 3.3.2 of HPI -032-01 requirements to the boundary of area of determination of protective measures are established, according to which it (boundary) shall be such that at beyond-design-basis accidents with maximum permissible emergency release of radioactive substances into environment predicted irradiation doses of public at the boundary of protective measures planning area and beyond do not exceed the values, requiring decision making on measures of public protection in case of radiation accident with radiation contamination of the territory, established in effective standards of radiation safety. In accordance with requirements of i. 3.1 of HPI -015-12 «Standard content of Personnel Protection Activity

Plan in Case of Accident at NPP», calculation of sizes of areas of radioactive contamination, doses of external and internal irradiation at beyond-design-basis accident is performed in accordance with appendix № 5 to NP-015-12 and is given in appendix № 5 to Protection activity plan.

Q.No 199	Country Switzerland	Article Article 17.1	Ref. in National Report p. 108
Question/ Comment	How is the concept of «waiver to take measures from external impacts» to be understood? Are all plants required to take measures until they fulfill the criteria for a waiver, or until they are safe against some design impacts defined by hazard degree I?		
Answer	Refusal to carry out activities to eliminate damage caused by external influences may be at low frequency external impacts or accidents, according to the russian regulatory document NP-064-05.		
Q.No 200	Country Switzerland	Article Article 17.1	Ref. in National Report p. 108
Question/ Comment	Do hazard degrees I and II account for site-specific factors?		
Answer	<p>Exhaustive lists of dangerous processes, occurrences and factors, effective at the territory of Russia, and which shall be analyzed for specific NPP sites are given in appendices 1 and 2 of regulatory document NP-064-05. In case of detection of specific processes, occurrences and factors not included in the said lists during the study of possible site of NPP location, they shall be analyzed and classified by levels of danger in accordance with requirements of items 2.2 and 2.4 of the above-mentioned regulatory document. If they constitute hazards of I or II degrees, special protection measures shall be compulsorily stipulated in the design.</p> <p>When standards and rules of engineering protection from these specific impacts are unavailable, general rules, according to which specific technical decisions are suggested, justified and established by developer upon agreement with state safety regulatory authorities in the established order, are effective.</p>		
Q.No 201	Country Switzerland	Article Article 17.1	Ref. in National Report p. 109
Question/ Comment	In the aftermath of Fukushima-Daiichi accident, it was decided to reassess the safety of Russian NPPs against extreme external impacts. What was the basis for choosing a wind speed of 56 m/s and a shock wave pressure of 30 kPa? Do these values represent an upper bound of the expected hazards valid for all Russian NPPs? To what return frequency do these values correspond?		
Answer	<p>Value of wind speed at storms and whirlwinds was adopted based on analysis and generalization of results of engineering-hydrometeorological research and monitoring of engineering-hydrometeorological conditions at NPP sites – operating, under construction and being designed. This wind speed value corresponds to return frequency of not more than 10E-4 1/year.</p> <p>Value of pressure in pressure-shock front was adopted in accordance with requirements of R&S NPP-5.6 «Standards of construction design with reactors of different types» and NP-064-05 «Accounting of external impact of natural and industrial origin on nuclear power utilization facilities». This value of pressure in pressure-shock front corresponds to return frequency of not more than 10E-6 1/year.</p>		
Q.No 202	Country Turkey	Article Article	Ref. in National Report 108

		17.1	
Question/ Comment	<p>The national report declares that «the rules NP-064-05 states that the following should be ensured for each newly designed NPP at low values of the external impact intensity adopted in the design basis:</p> <p>-The stability of protective structures of localizing systems to local impact loads to aircraft crash and other missiles that is equal in the contact area to impact load not less than of a light aircraft crash (5 tons of weight).</p> <p>Could you please provide additional clarification? What kind of aircraft crash properties (conditions) will be considered for the case of design basis and beyond design basis accidents (except the weight and crash speed of the aircraft)</p>		
Answer	<p>Stresses occurring at the crash of 5 ton aircraft shall be taken into account in any case. Consideration of the crash of heavier aircrafts can be included in the design basis. Consideration of the crash of heavier aircraft is mandatory in accordance with the requirement of Federal standards and rules (NP-064-05), if the possibility of its crash to NPP exceeds $10E-6$ per year. In PWR-TOI design the crash of 20 ton aircraft is considered as design accident, and 400 ton aircraft – as beyond-design basis accident.</p>		
Q.No 203	Country Ukraine	Article Article 17.1	Ref. in National Report page 107
Question/ Comment	<p>Were additional seismic hazard assessments conducted at Russian NPP sites taking into account advanced experience and practices, as well as IAEA recommendations (in particular SSG-9), etc.? If so, has the seismicity of sites changed compared to the original design and whether engineering safety margins were used to determine the site seismicity? Is it planned to revise requirements for seismic resistance in NPP siting (establish stricter requirements)?</p>		
Answer	<p>Seismic resistance of sites for seismically resistant NPP design in accordance with requirements of effective regulatory documents (NP-031-01, NP-032-01 and NP-064-05) and recommendations RB-006-98 and RB-019-01 is established with the use of deterministic and probabilistic approach for two levels of seismic resistance:</p> <ul style="list-style-type: none"> • intensity of design earthquake (DE) – for recurrence of 1 per 1000 years; • intensity of safe shutdown earthquake (SSE) - for recurrence of 1 per 10000 years; <p>with accounting for specific seismotectonic and soil conditions and their possible changes at construction and operation of NPP.</p> <p>Dynamic stability of soils during earthquakes of up to SSE included is also substantiated at the sites.</p> <p>Main provisions of determination of seismic stability of NPP Site do not contradict IAEA recommendations (SSG-9 in particular).</p> <p>Presently assessment of parameters of beyond-design-earthquake exceeding the level established in the design and requirement to their accounting at development of organizational and technical measures aimed at mitigating of negative impact of accident are included into regulatory requirements. The least annual frequency of excess of emergency release depends on ultimate use of probabilistic approach of seismic danger and with account for input into probabilistic assessment of seismic danger impact shall not exceed $10E-7$ (it is stated in i. 6.2 SSG-9 that this value can be extremely low (for example, $10E-8$)).</p> <p>Currently seismicity of NPP sites is under precising. Changing of seismic assessment of NPP sites is possible upon completion.</p>		
Q.No 204	Country United States of America	Article Article 17.1	Ref. in National Report Page 109
Question/	The report states that as a result of the safety analyses conducted, extra engineered features		

Comment were developed for the management of beyond design basis accidents to be implemented at the existing NPPs.

(1) Please clarify if these engineering features have been implemented.

(2) If not, please specify what are the plans for implementation.

Answer Additional evaluation of NPP safety under extreme external impacts with performance of «stress-tests» was carried out with account for international requirements on methodology of assessments of risks and safety of atomic power plants, which was prepared by Western-European association of regulatory authorities and approved by European Committee. «Reports on performance of analysis of NPP safety at extreme environmental impact» were developed for each NPP in operating organization.

In order to eliminate revealed deficiencies in safety at extreme external impact, «Updated measures on mitigation of beyond design basis accidents at NPP» for all operating NPPs have been developed and are currently implemented. The measures stipulate execution of the following key activities:

- performance of additional calculations regarding substantiation of NPP safety;
- improving of protection of main and emergency control rooms;
- implementation of measuring instruments and measuring channels which are operable under beyond-design and severe accidents;
- ensuring operability of system of water and gas sampling under beyond-design and severe accidents;
- improvement of seismic safety of NPPs;
- improvement of protection from flooding at Balakovo and Novovoronezh NPPs;
- improvement of protection from whirlwind impact;
- supply and installation of emergency mitigation equipment to NPPs – mobile diesel-generators of high and medium power, mobile diesel pump units of high pressure and diesel motor pumps for emergency makeup of reactor, steam generators, spent nuclear fuel pools and detached spent nuclear fuel pools;
- improvement of systems of ensuring hydrogen explosion safety in containment and protective shields of reactors of NPPs;
- making required changes and additions to NPP systems for ensuring prevention of design accidents development into beyond-design, and their implementation during management of beyond-design and severe accidents;
- improvement of safety of free standing spent nuclear fuel pool;
- development and correction of emergency mitigation documentation (instructions on elimination of design accidents, procedures of management of beyond-design and severe accidents, etc.);
- enhancing of emergency preparedness of NPPs;
- additional equipping of NPPs with specialized equipment (truck-mounted cranes, haul trucks, fuel servicing trucks, bulldozers, etc.) was carried out;
- in 2013 seismic protection at Unit № 2 of Smolensk NPP was put into experimental-industrial operation (without affecting reactivity elements);
- plants of dismantling and storage of spent nuclear fuel were put into operation at Kursk NPP and Leningrad NPP;
- etc.

In accordance with «Updated measures on mitigation of beyond design basis accidents at NPP» the following terms of implementation of planned activities at NPPs are established:

- development of management procedures for severe accidents at NPPs with PWR - 2014;
- implementation of measures at NPPs - 2014-2015;

- correction of instructions on elimination of accidents, procedures of management of beyond-design accidents, procedures of management of severe accidents - 2015-2016.

Q.No 205	Country Luxembourg	Article Article 17.3	Ref. in National Report section 17
Question/ Comment	Could you consider to invite an IAEA Site and External Events Design Review Mission for the selected site in the Kaliningrad Region?		
Answer	For the present we do not consider this possibility. For the sites located in the vicinity of neighboring countries full independent peer review of EIA (environmental impact assessment) is carried out. Regarding design safety issues, review of AES-2006 project for compliance with IAEA safety requirements GRS (Germany) was carried out in 2012-2013 (GRSR service of IAEA).		
Q.No 206	Country Austria	Article Article 18.1	Ref. in National Report 18.3, p115
Question/ Comment	Could you please share with us how the Russian Federation is going to assure the safety of the first floating nuclear co-generation plant during operation and during transport for refueling and maintenance against natural and man-induced external events (combination of events)?		
Answer	<p>In accordance with RF legislation the list of engineering civil defense measures and measures on prevention of natural and man-induced emergencies (ECDM of ES CD) is given in design documentation of floating nuclear co-generation plant (FNCP) in Pevek town of Chukotskiy autonomous region. Technical decisions approved in the section of ECDM of ES CD ensure protection of production personnel, public and territories from hazards occurring during military or sabotage operations, prevention of man-induced and natural ES, mitigation of their consequences.</p> <p>Activities and procedures aimed at ensuring safety of moving (transportation) floating power unit (FPU) were developed within the frameworks of project of FPU transportation on route St. Petersburg – the town of Pevek. The structure of transportation project is determined by requirements of Russian Maritime Registry of Shipping.</p> <p>Measures of ensuring nuclear and radiation safety of FPU within FNCP during operation, including transportation for execution of planned repair at the factory, during natural and man-induced external events (combination of events) were developed and justified in report of justification of safety of FPU.</p>		
Q.No 207	Country Canada	Article Article 18.1	Ref. in National Report Page 115
Question/ Comment	Were there any legislative or regulatory changes needed to allow for floating/transportable NPPs?		
Answer	<p>The object of utilization of nuclear power within floating nuclear co-generation plant (FNCP) is the floating power unit (FPU) – transportable nuclear plant. FPU – nuclear floating facility as per classification of Russian Maritime Registry of Shipping.</p> <p>To take into account the specifics of construction, transportation, operation and decommissioning of the PEB was necessary to amend the existing federal rules and regulations in the field of nuclear energy, as well as industry regulations.</p>		
Q.No 208	Country Canada	Article Article 18.1	Ref. in National Report Page 111

Question/ Comment The Design and Construction section of the report addresses principle features and characteristics of new NPP designs. Does the section description have as its basis, that the key descriptions for the implementation of defence in depth, incorporation of proven technologies (except for new designs), and design for reliable, stable and manageable operation are described in the fifth review meeting report? That includes also the licensee implementation and regulatory review and control activities. How was the specific consideration of human factors and human-machine interface overview addressed?

Answer 1. Description of implementation of individual components of defense in depth is available in different sections of almost every National report. Article 18 of the third National report contains one of the fullest descriptions of improved elements of this description.
2. The licensee implementation and regulatory review and control activities have always been and are the element of defence in depth.
3. Consideration of human factors and human-machine interface during designing is carried out based on national regulatory documents, as well as regulatory documents of IAEA, EUR, IEC, ISO, some of which are given the status of national standards.

Q.No 209	Country Euratom	Article Article 18.1	Ref. in National Report page 111
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Question/ Comment It is important to introduce safety features in order to ensure protection against malevolent crash of large civil airplane.

- Does selected AES-2006 design of the new NPP in the Kaliningrad Region ensure protection against malevolent crash of large civil airplane?
- What kind of design safety features, allowing to bring and maintain the plant in safe stable state after malevolent (postulated) crash of large civil airplane, are foreseen in AES-2006 design that is planned to be used while constructing the NPP in the Kaliningrad Region?

Answer In accordance with requirement of Technical assignment for NPP in the Kaliningrad Region, impacts related to aircraft crash are classified as the most significant. Engineering structures of buildings and constructions, as well as process pipelines, other communications and constructions were designed with account for impact of an aircraft crash with the following specifications: 5.7 t aircraft crash with the speed of 100 m/s. Additionally works on evaluation of impact of crash of large civil aircraft (Boeing 747-400) were carried out with the use of SOLVIA, LS-DYNA programs.
The consequences of crash of large civil aircraft onto reactor compartment building are viewed as beyond-design basis accident, whereby safe reactor shutdown without necessity to provide further NPP operation shall be ensured.
Calculation for crash of Boeing 747-400 was carried out for obstacle collision speed of 150 m/s. This speed significantly exceeds value of 100 m/s, most commonly used in such calculations, as well as the speed of performance of maneuvers of take-off and landing (less than 100 m/s).
Internal containment of 1,2 m thickness will not be pierced upon impact by motor with the approach speed of 150 m/s, even without accounting for the decrease of speed at breaking through protective structures. The internal surface of containment will crack. Scattering of concrete pieces will be prevented by internal metal cladding of the containment.
The main means are: double protective cladding, the system of concrete pre-stressing system, internal steel containment.

Q.No 210	Country Finland	Article Article 18.1	Ref. in National Report 155
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Question/ Comment Floating NPP is under construction at St.P. What are the requirements for licensing and against which requirements the facility will be licensed. Does the transportation to

Chukotka go via the Baltic Sea and what announcements will be done to other countries concerning the transportation?

Answer 1. Floating power unit (FPU) for floating nuclear co-generation plant (FNCP) is under construction in St. Petersburg.
Requirements to licensing of nuclear energy utilization facility – FPU – are similar to requirements for licensing of nuclear-power vessels at the stages of designing, construction, operation and decommissioning.
All organizations responsible for designing, construction and erecting of nuclear plant (NP) FPU, as well as organizations responsible for storage and handling of nuclear materials (NM) have licenses for corresponding types of activities.
At the stage of transfer (transportation) of FPU to operation location NM transporting organization shall have the license for handling NM during transportation.
At the stage of FPU operation as part of FNCP, operating organization shall have the license for NP operation (with account for specific features of operation within FNCP).
2. FPU will be transported en route St. Petersburg – Pevek town via Baltic Sea. Plan and transportation route of FPU through international or domestic waters haven been developed and take into account all requirements, stipulated by international and national regulatory legal acts in the field of nuclear energy utilization and commercial navigation.
FPU transportation route (developed in the framework of FPU transportation project) is laid, whenever possible, along traditional navigable waterways and outside of home waters of countries. During transportation FPU will definitely cross home waters of Denmark when crossing Denmark Strait (Great Belt, Kattegat and Skagerrack), will pass near territorial sea or cross areas of exclusive economic interests of Estonia, Finland, Poland, Germany, Sweden, Norway.
All procedures of notification of the above-mentioned coastal states and receiving information about availability of restrictions in transport route through their home waters will be carried out by legal departments of organizations responsible for FPU transportation, and will be performed together with Department of Industry and Trade of Russia and Ministry of Foreign Affairs of Russia (Russian MFA).
Transportation project does not stipulate calling of caravan with FPU at foreign ports throughout the whole transportation route. However, in a number of cases calling of caravan at foreign port (port of refuge) can be required. Therefore, simultaneously with notification about passing of the caravan with nuclear vessel in tow, organization responsible for transportation together with Russian MFA will develop procedure of notification (if necessary, request for permission) of foreign states about the possibility of caravan calling at ports or closed waterways.

Q.No 211	Country Finland	Article Article 18.1	Ref. in National Report 114
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Question/ Comment Concerning the Baltic NPP, there has been information that this project is changed from AES-2006 for a smaller power unit. What is the current status of the project?

Answer State enterprise «Rosatom» hasn't made any decisions about allocation of other power units at the site of Baltic NPP, except for AES-2006 for which construction license was received.
In the end of 2013 correction of project documentation was performed due to application of turbine unit manufactured by JSC «Alstom Atomenergomash» in the project of Baltic NPP (in accordance with the decision of State enterprise «Rosatom»).

Q.No 212	Country Germany	Article Article 18.1	Ref. in National Report pages 111-114
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Question/ Chapter 18.2 «Principal features and characteristics of new NPP designs» describes

Comment approaches for designing new WWER reactors (AES-2006, WWER-TOI).
What are the corresponding principal features and characteristics for small and medium sized reactors (SMRs), which are planned for future use?

Answer Floating power unit (KLT-40Ñ (35 MW)) with water coolant for floating nuclear co-generation plant (FNCP) is under construction and planned construction of experimental-industrial unit with SVBR-100 reactor with liquid metal coolant.

Q.No 213	Country Lithuania	Article Article 18.1	Ref. in National Report Page 111 - 116
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Question/ Comment Could you please clarify if protection against malevolent crash of large civil airplane would be addressed into the design of new NPP in the Kaliningrad Region and what technical measures are foreseen to mitigate consequences of such crash?

Answer Constructions of buildings and structures of nuclear power plants in the Kaliningrad region , as well as technological pipelines , communication and other structures designed to meet the impact of the aircraft with the following characteristics : a plane crash weighing 5.7 tons at a speed of 100 m /s . As a design basis event in the analysis of accidents a plane crash type Phantom RF-4E weighing 20 tons at a speed of 215 m /s is considered. For this event the design meets all the safety requirements on a conservative basis.
As a beyond design basis event a plane crash Boeing 747-440 weighing 400 tons at a speed of 150 m/s is considered taking into account fuel fire. For this event the design is provided by the absence of a release of radioactive substances into the environment.
The main technical measures: double containment system prestressing concrete, steel internal sealing containment system of concrete pre-stressing system, internal steel hermetic containment.

Q.No 214	Country Pakistan	Article Article 18.1	Ref. in National Report Table 18.1, Page 113
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Question/ Comment Reference Table 18.1, it is stated that in WWER-TOI plant, the amount of solid radioactive waste formed during unit operation will not be more than 44.5 m3. Russia may share the design measures taken to reduce the solid radioactive waste.

Answer SRW treatment system
Low- and medium active waste in order to decrease the volume arriving for storage are subject to treatment at the following plants, at that
90 % of total volume of medium active waste have radiation level of up to 1 mSv/h at the distance of 0,1 m, that is, they can be treated at:
- reception, control sorting and fragmenting plant;
- prepressing (filter-press) plant;
- incineration plant;
- high pressure compaction plant;
- plant of pyrolysis of spent ion-exchange resins.
SRW reception, control sorting and fragmenting plant
Reception, control sorting and fragmenting plant is intended for reception, control sorting of solid wastes coming in circulating containers for SRW from locations of formation and fragmenting with further sending to SRW treatment plants.
Prepressing (filter-press) plant
Prepressing plant is intended for fragmenting and pressing of spent filters of special ventilation systems and NPP gas cleaning systems, and is included into equipment of SRW sorting section.
Average coefficient of reduction of the volume of pressed SRW at the plant is 3.

Incineration system

Incineration system is intended for reduction of volume of solid low and medium active combustible radioactive waste and further packing of ash to compacted barrels with the aim of their further conditioning and sending for long-term storage.

High pressure compaction plant

High pressure compaction plant is intended for SRW volume reduction. The plant ensures treatment of:

- non-flammable pressed SRW;
- spent filters of special ventilation system and gas treatment systems after prepressing;
- ash formed after treatment of flammable SRW at incineration plant;
- metal wastes;
- carbon residue forming after treatment of spent ion exchange resins.

Average coefficient of reduction of the volume of pressed SRW at the plant is from 5 to 7.

Plant of pyrolysis of spent ion-exchange resins

Plant of pyrolysis of spent ion-exchange resins (SIER) is intended for thermal treatment of spent ion-exchange resins, formed at NPP.

By way of pyrolysis treatment the following results are achieved:

- waste volume reduction;
- changing SIER into chemically stable, non-active form, and together with cementing in the barrel to final product, resistant to desalination.

Carbon residue is put into barrels, which are sent to superpressing plant, wherein high pressure compaction unit presses it into bricks. Bricks are put in barrels of large-capacity and sent to cementing plant.

Resin volume reduction after its conditioning:

- reduction coefficient resin/ash: 7
- reduction coefficient with account for cementing: 2,5.

Also solidified liquid radioactive waste obtained in the course of liquid radioactive waste (LRW) treatment is related to SRW.

LRW volume reduction occurs by way of their evaporation, which ensures required treatment coefficient of 10E5 in combination with minimally possible volume of radioactive salts concentrates (vat residue).

Additional evaporation to the maximum salt of vat residue changes LRW into SRW and reduces the amount of solidified (cemented) radioactive waste.

Q.No	Country	Article	Ref. in National Report
215	Ukraine	Article 18.1	page 115
Question/ Comment	National report describes the current situation and prospects for construction of floating nuclear co-generation plants. The Basic Safety Rules for Nuclear Plants establish probabilistic safety criteria for all types of NPPs. Do these probabilistic safety criteria apply to floating NPPs or separate criteria should be developed?		
Answer	Floating power unit (FPU) for floating nuclear co-generation plant (FNCP) - rack-mount non-propelled vessel with nuclear power facility (NPF). Probabilistic safety criteria are applied for FPU the same way as for nuclear vessel. Construction of atomic vessels and floating facilities is performed under technical supervision by Russian Maritime Registry of Shipping (RMRS). Technical supervision by RMRS stipulates stage-wise evaluation of conformance to requirements from the stage of material preparation before completion of all tests with further operation of atomic vessel or atomic floating facility. Thus, regarding atomic vessels and atomic floating facilities not only probabilistic assessment, but objective safety assessment was implemented. Objective assessment is based on review of technical processes and documentation, control, tests, acceptance, making decision on permission for further production and certification.		

Q.No 216	Country United Kingdom	Article Article 18.1	Ref. in National Report 18.2
Question/ Comment	<p>Please provide details of how the concepts of:</p> <ul style="list-style-type: none"> • Proven design • Defence in depth <p>have been incorporated into the overall design of new NPPs</p>		
Answer	<p>All used technical and circuit designs are justified by experience of designing, operation of NPP with PWR-1000, as well as estimation-experimental justification of AES-2006 design. Resistance of AES-2006 project to external impacts is schematically shown on picture 18.1 of National Report.</p> <p>The principle of defense in depth is one of the main criteria and safety guidelines formulated for new projects.</p>		
Q.No 217	Country Austria	Article Article 18.2	Ref. in National Report 18.2, p112-113
Question/ Comment	<p>It is stated, that the impact of military aircraft (weight 20 t, speed 200 m/s) on the AES-2006 and WWER-TOI containment is a design basis initiating event and poses no threat to the structural stability of the containment. What is the assumed mass of the fuel in the aircraft? Has the aircraft crash impact been evaluated for other safety related buildings on site? What are results of the studies for the aircraft crash with a weight of 400 t, which is - as mentioned in the report – a beyond design basis initiating event?</p>		
Answer	<p>The mass of fuel was assumed in accordance with technical specifications of the aircraft and accounted for in total aircraft weight.</p> <p>Position of buildings at NPP site excludes damage of several buildings by crashing aircraft. The most conservative version of aircraft crash into reactor compartment building was considered in the project.</p> <p>Performed strength evaluation of internal protective shield showed compliance with strength criteria at the fall of commercial aircraft of 400 t weight, that is, tightness of internal protective containment.</p>		
Q.No 218	Country Belarus	Article Article 18.2	Ref. in National Report info for Article 18
Question/ Comment	<p>What are the procedures for monitoring (influencing) the designing organizations, licensed in RF to design nuclear power plants in RF(also for other countries)?</p>		
Answer	<p>In accordance with the Federal Law «On the Use of Atomic Energy» and the Regulation on licensing activities in the field of nuclear energy (endorsed by the Government of the Russian Federation of 29.03.2013 № 280) Design and construction of nuclear plants (NPPs) is an activity , for which the license is required by the Federal service for Ecological, technological and Nuclear Supervision (hereinafter - Rostehnadzor). One of the documents on which Rostehnadzor gives license to design a quality assurance program for the design and construction of nuclear plants (NPPs) (hereinafter - POKAS (R)) . Requirements for the structure , contents and procedure development POKAS (L) established by federal rules and regulations «Requirements for quality assurance programs for nuclear facilities (NP-090-11). Requirements of NP-090-11 provides for the development of quality assurance programs of private organizations performing activities affecting the safety of nuclear facilities (hereinafter - the nuclear facilities) (including NPP) , on a separate stage of life nuclear facilities and / or implementation licensed activity in the field of nuclear energy. In these private programs POKAS (L) describes the order of monitoring compliance with the requirements in the draft NPP federal rules and</p>		

regulations in the field of nuclear energy , technical specifications , maintenance and quality control of the NPP , as well as descriptions about audits (inspections) implementation developed POKAS (P) and quality assurance programs contractors (subcontractors) organizations. In accordance with the requirements of NP -090- 11 operating organization provides coordination , follow-up and evaluation of the impact of program quality assurance organizations operating and providing services for the operator.

Q.No 219	Country China	Article Article 18.2	Ref. in National Report section 18
Question/ Comment	Upgrade and improvement of the AES-2006 design in WWR-TOI project were completed. Is there any comparison between AES-2006 and AP1000 regarding to the economic, technology, environment area? What is the result of the comparison?		
Answer	<p>Our specialists with the participation of independent international experts carried out comparison between PWR-TOI designs and not only improved AES-2006, but also AP1000.</p> <p>Based on comparison it was revealed that the main competitor of PWR-TOI design for the coming years is indeed the AP1000 project.</p> <p>Based on results of technical comparison it was shown that, on the whole, technical parameters of PWR-TOI design are not inferior to parameters of competitors, and they also comply with modern regulatory requirements. At that, in spite of the fact that PWR-TOI is worse than AP1000 in terms of dimensions, the cost of equipment for PWR-TOI design is lower than for AP1000.</p> <p>Based on results of comparison of economic parameters it was shown that PWR-TOI design has advantages over AP1000 both in the cost of capital development, and in incremental cost of power, which amounts to 10 % due to difference in power.</p> <p>Advantage of PWR-TOI over AP1000 regarding integral safety indices was indicated. Particularly, such parameter as frequency of reactor core melt in PWR-TOI comprises $2,4 \cdot 10^{-8}$ 1/reactor*year, while for AP1000 this parameter comprises $5 \cdot 10^{-7}$.</p>		
Q.No 220	Country France	Article Article 18.2	Ref. in National Report § 18.2 - p. 112 and 113
Question/ Comment	Russian Federation does not explicitly describe the climatic hazards which have to be assessed during siting assessment, and Russian Federation does not give details regarding the climatic loads admissible for the AES 2006 new design. Could Russian Federation present the climatic load retained for new NPP design?		
Answer	<p>Requirements to climatic loads of buildings and facilities of AES-2006 design are defined in the following regulatory documents:</p> <ul style="list-style-type: none"> – PiN AÝ-5.6 Norms of construction designing with reactors of different types; NP-064-05 Accounting of natural and man-made external impacts on nuclear power utilization facilities; – SP 131.13330.2012 Code of rules. Construction climatology. Updated revision of SNiP 23-01-99*. <p>NPP-2006 project satisfies the demands of climatic loads, as defined in these regulations.</p>		
Q.No 221	Country India	Article Article 18.2	Ref. in National Report Page 113
Question/ Comment	The major tasks defined for AES-2006 development have been listed. One of the task listed was of introduction of additional systems and devices that prevent and limit the consequences of SA. Please provide examples of such additional systems and are they further re-examined based on Post-Fukushima lessons.		

Answer For AES-2006 power units the following main (additional) design decisions were stipulated:

1. Stipulated:
 - mobile air-cooled diesel generator (MDGP);
 - mobile pump unit (with backup) (Mobile pump unit) for makeup of cooling ponds, PHRS (passive heat removal system) tanks, primary circuit from external source.
2. Design of alternative component cooling system with air-cooling tower of closed type with fans.

These decisions were made based on safety analysis of AES-2006 design at extreme external impacts due to the lessons received from the accidents at NPP «Fukushima-Daiichi».

Q.No 222	Country India	Article Article 18.2	Ref. in National Report Page 113
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Question/ Comment The table provides technical and economic characteristics of VVER-TOI project. For the purpose of aircraft impact, an aircraft of 20 tonnes is considered. While current guidelines in some countries require Aircraft Impact Assessment for a large commercial aircraft. Any particular reason for choosing light aircraft for the analysis may please be provided.

Answer In the technical assignment for VVER-TOI design the following requirements were established: «...

- consideration of crash of Phantom RF-4E type aircraft of 20 ton weight with the speed of 215 m/s as design basis event. For this event the design provides all requirements of safety on the conservative basis;
- crash of aircraft of Boeing 747-440 type of 400 ton with the speed of 150 m/s with account for fuel combustion is considered as beyond-design basis event. For this event design provides absence of release of radioactive substances into environment.

Confirmation of «absence of release of radioactive substances into environment» is performed specifically by assessment of impact of the aircraft of the said weight to NPP.

Q.No 223	Country Japan	Article Article 18.2	Ref. in National Report p112
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Question/ Comment The design implementation to Aircraft crash for new plants is explained in the section.

How was the evaluation of aircraft crash to the operating plants implemented?

Answer Engineering constructions of buildings and facilities, as well as pipelines, other communications and structures were designed with account for external impact from aircraft crash. The Table given in the appendix to this answer shows the parameters of external impacts caused by human activity.

As per calculation results the wall will keep its integrity and prevent ingress of large amount of aviation fuel contained in aircraft wings into RC. The fuel will be disseminated outside RC building with its possible combustion in the open atmosphere.

In the technical assignment for VVER-TOI design the following requirements were established:

- consideration of crash of Phantom RF-4E type aircraft of 20 ton weight with the speed of 215 m/s as design basis event. For this event the design provides all requirements of safety on the conservative basis;
- crash of aircraft of Boeing 747-440 type of 400 ton with the speed of 150 m/s with account for fuel combustion is considered as beyond-design basis event. For this event design provides absence of release of radioactive substances into environment.

Calculation carried out by forth integration motion equations with the use of software package SOLVIA 99 and for external wall dynamic load of from aircraft wings jV with

the use of LS-DYNA program. Based on calculations, internal gain per unit length in the elements of internal protective cladding were determined. Internal containment of 1,2 m thickness will not be pierced upon impact by motor with the approach speed of 150 m/s, even without accounting for the decrease of speed at breaking through protective structures. The internal surface of containment will crack. Scattering of concrete pieces will be prevented by internal metal cladding of the containment.

Support Document s Table - The parameters of external impacts caused by human activity

1.13 External impacts caused by human activity		
Aircraft crash:		Load is assumed as per NP-064-05, i.6.8
- aircraft:		
- weight, kg	5700	
- speed, m/s	100	
- motor:		Motor is considered a perfectly rigid body
- weight, kg	200	
- diameter, m	0,45	
- speed, m/s	45	
- explosion and/or combustion of aviation fuel:		Explosion is deflagration type
- weight, kg	200	

Q.No 224	Country Korea, Republic of	Article Article 18.2	Ref. in National Report 112
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Question/ Comment In 112 page of the chapter 'Principal features and characteristics of new NPP design', it is stated that stability of the AES-2006 design to external impacts is ensured. Please explain why impact of external fire on AES-2006 design has not been considered and what the regulatory requirements for the external impacts are.

Answer Impact of external fire is by all means taken into account in AES-2006 design. Impact factors are shown schematically in Fig. 18.1, for display of external fire graphic representation paradigm was not found. Requirements to external impacts were stated in NP-064-05 «Accounting of natural and man-made external impacts to nuclear power utilization facilities».

In accordance with the concept of defence in depth reflected in IAEA requirements № NS-R-1 and «General provisions of nuclear power plants safety assurance PNAE G-01-011-97 (ОПБ-88/97) in order to exclude impacts of external fires to NPP safety the system of physical and organizational barriers of NPP protection from possible external fires was adopted in AES-2006 design.

Defence in depth of NPP of AES-2006 design stipulates the following protective measures from possible external fires:

- when selecting the site within the radius of no less than 2 kilometers, possible external man-made events at operating fire hazardous industrial facilities are analyzed and considered, for each specific site all possible scenarios of development of such industrial events are considered (for example: burning of tank truck with diesel fuel at the road near NPP, fires of diesel fuel spill at accidents with tanks at industrial facilities situated near NPP, etc.);
- fire lines along NPP perimeter of 100 m width are stipulated;
- for each NPP allocation of fire station at the distance of not more than 2 km from the furthest fire dangerous object at NPP Site is stipulated, forces and means for equipping the fire station are established as sufficient for provision of extinguishing of all types of possible fires;

- monitoring and extinguishing of forest fires at the territory near NPP is entrusted to and provided by the forces of MChS, Russian Federation Ministry of emergencies, equipped and staffed in proper way.
- to protect from smoke screening at external fires at MCR and ECR, possibility of ventilation systems operation in the mode of full recirculation in these rooms during the time of extinguishing of the corresponding fire is stipulated;
- buildings and facilities of AES-2006 design of I category of responsibility for radiation and nuclear safety are assumed as I degree of fire resistance with corresponding specified limits of fire resistance of engineering structures.

Efficiency of the above-mentioned protective measures is inspected for each individual NPP at the stage of designing by way of analysis of calculations of parameters of possible external fires.

Q.No	Country	Article	Ref. in National Report
225	Korea, Republic of	Article 18.2	113
Question/ Comment	In 113 page of the chapter 'Principal features and characteristics of new NPP designs', it is stated that additional systems and devices are introduced to prevent and limit consequences of severe accidents. Please provide more detailed information about these introduced systems and devices and their functions in the case of severe accidents.		
Answer	<p>The most representative from the point of view of safety increase including prevention and mitigation of consequences of beyond-design accidents are the following systems and devices:</p> <ol style="list-style-type: none"> 1. Internal and external containment of reactor plant: <ul style="list-style-type: none"> - internal containment is manufactured from prestressed reinforced concrete with steel cladding for maintaining of up to 0,5 MPa pressure with 1,5 reliability coefficient inside; - external containment from reinforced concrete designed for protection from external natural and man-made impacts. By creation of negative pressure in the reactor building annulus additional protection from radioactivity release into environment is performed (passive filtering system of reactor building annulus). 2. Device of localizing and cooling of melt («Trap»). <p>The «Trap» allows to preserve integrity of protective cladding and exclude the release of radioactive products into environment even at severe accidents.</p> <ol style="list-style-type: none"> 3. Hydraulic reservoir of the third stage, increasing the stock of boron solution. 4. System of passive heat removal (PHRS) from steam generators, ensuring removal of residual heat from reactor core (at loss of all sources of alternating current (blackout) or loss of ultimate heat sink) and cooling of the space under protective cladding within air heat-exchangers cooled by atmospheric air. 5. Passive hydrogen recombiners, excluding rise of hydrogen concentration at BDBA. 6. Mounting of pump units supplied from self-contained mobile air-cooled diesel generator for makeup of reactor and spent fuel pool at failure of all sources of alternating current (blackout) with leak in primary circuit at rupture of pipeline of maximum diameter. 7. Alternative closed cooling circuit of RP cooling and containment with air-cooling tower of closed type with fans. <p>Cooling tower is used as ultimate heat sink of cooling pool and heat-exchanger of emergency and stepless cooling down of reactor.</p> <p>Fans of cooling tower and pumping equipment are powered from self-contained mobile diesel-generator.</p>		
Q.No	Country	Article	Ref. in National Report
226	Korea, Republic of	Article 18.3	115

Question/ Comment	In 115 page of the chapter 'Current situation and prospects of construction of floating nuclear co-generation plants', it is stated that Rosenergoatom is implementing a small power project which considers construction of floating nuclear co-generation plant (FNPP). Please provide more information whether regulatory requirements for FNPP are same as those of commercial nuclear power plants. If there is any regulatory difference, please explain the difference.		
Answer	<p>Nuclear power utilization facility at floating nuclear co-generation plant (FNCP) is floating power unit (FPU) - rack-mount non-propelled vessel with nuclear power plant. Consequently, normative-legal base for FPU was established upon normative-legal documents, defining regulatory requirements to atomic vessels.</p> <p>The main differences of FPU from ground nuclear energy utilization facility - nuclear power plants are: design features; FPU construction at shipbuilding factory; application of marine propulsion reactors; operation in water medium; integration in the floating nuclear plant, as a separate self-contained component; possibility to change operation location of FPU; execution of scheduled maintenance of FPU at shipbuilding factory; specifics of personnel training.</p> <p>In addition to requirements establishing general requirements for nuclear power plants, for floating power unit safety requirements are established as for transport infrastructure object, its application area, which cover not only design and organizational issues.</p>		
Q.No 227	Country Korea, Republic of	Article Article 18.3	Ref. in National Report 115
Question/ Comment	In 115 page of the chapter 'Licensing associated with design and construction of nuclear plants', it is stated that the set of the nuclear and radiation safety supporting documents should include a PSA Level 1. Concerning the PSA, do you have a plan to utilize results of PSA Level 2 and 3 in the regulatory requirements in the near future?		
Answer	<p>For reporting period RTN Policy Statement «Application of probabilistic safety analysis and risk - informative methods for nuclear power plants» was adopted. In it, in particular , it is noted that the accident at the NPP</p> <p>«Fukushima- Daiichi « showed that the protection of nuclear power plants against external impacts of natural and anthropogenic origin is an important aspect of the safety of nuclear power plants. Requirement that PSA levels 1 and 2 included in the draft revised by «General Provisions safety of nuclear power stations». PSA Level 2 for all russian VVER-type NPP were developed. Development of PSA level 3 is not required by regulations and not planned by the operator.</p>		
Q.No 228	Country Canada	Article Article 19.1	Ref. in National Report Page 123
Question/ Comment	Actions of personnel during accidents and emergencies are described in the report. Are there specific standards or other documentation adopted to guide the organization and personnel? To what extent are the new severe accident management guidelines referenced in the report consistent with international practices?		
Answer	<p>1. Activities of personnel protection are regulated by «Personnel Protection Activity Plan in Case of Radiation Accident at NPP». This plan is developed based on corresponding Typical plan. In 2013 new revision of «Typical content of personnel protection activity plan» NP-015-12 was implemented, the said document reflects up-to-date normative base of Russia, takes into account latest IAEA recommendations and experience of elimination of accident at «Fukushima» NPP. Completion of revision of activity plans of all NPPs in accordance with the new content is planned for April of 2014.</p> <p>In part of accidents prevention, management of design basis and beyond-design basis accidents, as well as in part of elimination of consequences of accidents at NPP,</p>		

documentation system is effective in Rosenergoatom which contains specific instructions for shift operating personnel and management about activities in these situations, including instructions about cooperation with departmental formations, municipal and state bodies. Besides regulatory documents of Federal level, as well as those cited in the report on accident mitigation instructions, manuals and personnel and public protection plans, other regulatory documentation, which is included into job descriptions of shift operating and management personnel, also exists, for example:

- cards of personnel actions at severe beyond-design basis accidents and procedure of cards application;
- methodology of diagnosis/prediction of process and radiation environment at NPPs of Concern «Rosenergoatom» for crisis expert groups of different response levels (power units with RP RBMK-1000);
- provision of procedure of submitting process parameters of power units of nuclear power plants to Crisis center and technical support centers;
- other documentation in part of functioning of Crisis center, NPP and OPAS group.

2. Regarding conformance of new manuals of management of severe accidents to international practices. For example: In the course of development of «Typical procedure of severe accidents management for NPPs with VVER-1000» (SAMP - severe accidents management procedure) specifically the following international documents were used:

1. IAEA Safety Reports Series. Implementation of Accident Management Programmes in Nuclear Power Plants, No 32, 2004.
2. G.Vayssier. SAMIME – An EC Concerted Action on Severe Accident Management in Europe, 2001.
3. OECD Workshop on the Implementation of Severe Accident Management Measures. Villigen-PSI, Switzerland, September 10-13, 2001.
4. S.Guieu. Prevention of Delayed Containment Failure – The Sand-Bed Filter – Characteristics and Role in Severe Accident Management. OECD Workshop on the Implementation of Severe Accident Management Measures. Villigen-PSI, Switzerland, September 10-13, 2001.
5. S.Guieu. Addressing Hydrogen Risks During Severe Accidents. EDF Approach. OECD Workshop on the Implementation of Severe Accident Management Measures. Villigen-PSI, Switzerland, September 10-13, 2001.
6. SAMA Analysis Guidance Document, NEI-05-01,2005.

RTN develops special safety guide containing requirements for SAMG.

Q.No 229	Country Belarus	Article Article 19.2	Ref. in National Report info for Article 19
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Question/ Comment In which cases is it allowed to make changes to the documentation relating to the limits and conditions of safe operation and how often does it happen?

Answer Changing the limits and conditions of safe operation is carried out on the procedure for license amending. Limits and conditions of safe operation vary rarely based on the appropriate justification.

Q.No 230	Country France	Article Article 19.3	Ref. in National Report § 19.4 - p. 120 to 122
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Question/ Comment Could Russian Federation mention if the programs for periodic maintenance, testing, inspection and verification of the structure, systems and components are approved by the regulatory body? Is this also the case for the modifications or updating of these programs? Are the Russian maintenance and testing periodic programs regularly updated? How does Russian Federation take into account experience feedback in their periodic maintenance programs?

Answer	<p>1. Requirements to approval of schedules of maintenance and repair of equipment by regulatory authority are absent in effective rules and regulations of nuclear power engineering.</p> <p>2. Equipment maintenance programs are regularly updated.</p> <p>Operating experience is taken into account in the programs of periodical maintenance by introduction of changes into them as per results of analysis of reports investigation of deviations (violations) in NPP operation.</p>		
Q.No 231	Country United Kingdom	Article Article 19.3	Ref. in National Report 19.3
Question/ Comment	Documents specifying these activities are «approved by the NPP management». What role does the regulator have in approving scheduling maintenance and repairs, inspections and tests?		
Answer	<p>Technical inspection of equipment and pipelines, which are registered in Rostekhnadzor is established by RTN inspections taking into account the timing of the survey.</p> <p>Schedules of maintenance schedules and repair, inspection and testing are developed by NPP staff considering the timing of the technical inspection of equipment and pipelines, but not approved by Rostekhnadzor.</p> <p>The regulatory body shall check:</p> <ul style="list-style-type: none"> - Compliance with the scheduled frequency of maintenance intervals specified in the design (design) documentation, which , in turn, developed on the basis of existing rules and regulations in nuclear energy; - Compliance completeness performed maintenance and repair specified in the design documentation. <p>Tests at NPP not stipulated by technical specifications and operating instructions shall be carried out as per the programs and procedures containing measures on ensuring safety of these tests.</p> <p>Programs and procedures of tests shall be agreed with developers of NPP project and approved by NPP operating organization. Tests are permitted by Rostekhnadzor in accordance with conditions of change from one stage of works to another established in the License, and carried out upon permission of NPP operating organization.</p> <p>Postponement of repair terms and reduction of volume of works shall be substantiated by nuclear facility administration, approved by operating organization and shall undergo expertise by Rostekhnadzor with introduction of changes into license conditions.</p> <p>These requirements of regulatory documents are checked during inspections execution.</p>		
Q.No 232	Country France	Article Article 19.4	Ref. in National Report § 19.5 - p. 123
Question/ Comment	Could Russian Federation mention the main evolutions and changes in its accidental response procedures and in accidental response management further to the Fukushima Daiichi NPP accident?		
Answer	<p>After the Fukushima Daiichi NPP accident, inspections and analyses of safety assurance at extreme external impacts were carried out at all Russian NPPs. Analysis of emergency procedures and manuals in part of sufficiency of personnel actions at accidents related to extreme external impact was carried out.</p> <p>Number of emergency response trainings of personnel regarding actions during beyond-design basis accidents was increased.</p> <p>Works on development and verification of «Procedure of severe accidents management» (SAMP) are carried out.</p>		
Q.No 233	Country Japan	Article Article	Ref. in National Report p121

		19.4	
Question/ Comment	<p>It is mentioned in page 121, All on-site events are reported by NPP management to the Operating Organization and Regulatory Body in the early notification. During the next 15 days, full report are sent to R/B and Operating Organization-h</p> <p>1. Are these early notifications and full report published and are they available to the public from R/B?(page 121)</p> <p>2. Are the quarterly and annual report of NPP operational events by Rosenergoatom publicly available?(page 122)</p>		
Answer	<p>Operational, preliminary messages and reports on investigation of events that occurred at Russian NPPs are not subject for publishing, taking into account specific technical nature of information. In specific cases operating organization and Rostekhnadzor provide brief information about events at NPP to public.</p> <p>Annual reports on NPP safety and consolidated annual report of Rosenergoatom, including information about deviations in NPP operation are submitted to regulatory body, State corporation of nuclear power «Rosatom» and organizations included into management circle of Rosenergoatom or analysis and application in work.</p> <p>In Rosenergoatom «Provision of consolidated safety characteristics of nuclear power plants of Rosenergoatom was implemented for submission to Federal authorities and publishing in mass media». In accordance with this provision information on the state of safety of NPP power units for submission to State corporation of nuclear energy «Rosatom», to Federal executive authorities and mass media is prepared every month. Information on NPP safety for public is placed at official Rosenergoatom internet site http://www.rosenergoatom.ru.</p> <p>The main conclusions of the analysis of operational nuclear power plants , deficiencies organization operating nuclear power plants are given in the Annual Reports of RTN . These reports are publicly available online at RTN : http://www.gosnadzor.ru/public/annual_reports/.</p>		
Q.No 234	Country Japan	Article Article 19.5	Ref. in National Report p124
Question/ Comment	<p>In the last paragraph of 19.5, it is mentioned that based on OPB-88/97, SBEP are prepared for the emergency instruction.</p>		
Answer	<p>1. How does Rostekhnadzor (Regulatory Body) confirm the appropriateness?</p> <p>2. And how does the training for the operator of the instruction implemented by the NPP operator.</p> <p>3. Is the implementation of the training confirmed by the Regulatory Body?</p> <p>1. In symptom-oriented type the following were developed:</p> <ul style="list-style-type: none"> - «Procedure of accident elimination» (AEP); - «Beyond-design accident management procedure» (BDAMP). <p>These documents are included into the set of license documentation, which is required for obtaining of license for operation of NPP power unit and undergoes expert analysis in Rostekhnadzor.</p> <p>2. The operating organization has its own system of selection, training, inspection and maintenance of the knowledge and skills of workers is fully responsible for their safety. Knowledge of operational documentation, including SOAI, included in job descriptions requirements specified operating personnel and checked periodically EO examination boards.</p> <p>3. When performing checks by operating organization Rostekhnadzor controls conformance of personnel training system to established requirements. In accordance with administrative regulation of performance of the state function of licensing of activities in</p>		

the area of nuclear power utilization by Federal agency for environment, process and nuclear supervision Rostekhnadzor issues permits to NPP personnel, including the right to maintain technological process by shift operating personnel of main control unit.

Examination of theoretical knowledge of applicant and practical skills of applicant - for the shift operating personnel at obtaining of permits for the right to perform works in the field of nuclear power utilization for workers of nuclear power utilization facilities is performed by examination committee in the central office of Rostekhnadzor or MTU of Rostekhnadzor with account for specific features of NPP, job descriptions of applicant and type of activity.

Lists of questions for checking of theoretical knowledge are developed with account for qualification requirements to specific positions (basic education, work experience and volume of knowledge) qualification manual.

Checking of knowledge is performed with the cards, including 10 questions in accordance with the held position (working as substitute) of the employee.

Q.No 235	Country Lithuania	Article Article 19.5	Ref. in National Report Page 123
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Question/
Comment The section 19.5 is titled as «Actions of personnel during accidents and emergencies». Hereinafter in the chapter the term pre-emergency is used, while emergency does not occur at all.

Could you please clarify the relation between the terms pre-emergency and emergency?

Answer The said terms are defined by Russian Federal regulations «General provisions of nuclear power plants safety assurance» OPB-88/97, namely:
PRE-EMERGENCY SITUATION - NPP state characterized by violation of limits or conditions of safe operation which did not develop into an accident.
EMERGENCY - disturbance in NPP operation, at which release of radioactive substances and/or ionizing radiation beyond limits stipulated by design for normal operation in the amounts exceeding established limits of safe operation occurred. Emergency is characterized by initial event, course of development and requirements.
The term «emergency» in the title of section 19.5 is used incorrectly.

Q.No 236	Country Lithuania	Article Article 19.5	Ref. in National Report Page 123 - 124
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Question/
Comment On page 123 it is stated that «In case of accidents or pre-accident conditions at NPP units, the operating personnel should follow the requirements of emergency response documents, such as procedures on eliminating pre-accident conditions and design basis accidents, guidelines for the management of beyond design basis accidents, and personnel protection plans.»

Further on page 124 It is stated that «Operating Organization has developed the Symptom-Based Emergency Procedure (SBEP) for all nuclear units with WWER and RBMK reactors».

Could you please clarify whether SBEP and guidelines for the management of beyond design basis accidents is a double-name document or they are two different documents? Also no information is provided for the mode of training of the operating personnel, or other members of the organization in emergency response actions from SBEP/guidelines for management of beyond design basis accidents.

Answer Developed for power units with RBMK SOAI and «Beyond-design accident management procedure» (BDAMP) are two separate documents.
VVER «Procedure of accident elimination» (AEP, ILA in Russian) and «Beyond-design accident management procedure» (BDAMP, RUZA in Russian) were developed in the form of symptom-oriented instructions (SOAI).

Operational personnel are training to act in accordance with the mentioned instructions and guidelines.

Steps made by the members of emergency response organizations according «Action Plan for the protection of plant personnel» are processed in the command post and integrated emergency response drills.

Q.No 237	Country Poland	Article Article 19.5	Ref. in National Report p. 123-125
Question/ Comment	Who is to provide technical support to plant control room operators at the first onset of an abnormal event or accident – whether a plant shift supervisor and (on-shift / on duty) safety engineer (if such a position exists at Russian NPPs), or off-site organizations as: OPAS of Rosatom assisted by relevant Technical Support Centers (as described in sec. 16.5), or Emergency Technical Centers (mentioned in sec. 16.5)?		
Answer	<p>At the beginning of the development of the emergency situation or accident at the power unit , prompt technical support to control room operators , in accordance with applicable industry guidelines , provides NPP unit shift supervisor or NPP shift supervisor. NPP shift supervisor is responsible for the initial assessment of radiation- dangerous situation or accident and forecast the radiation environment outside NPP as well as the identification of an abnormality in the safe operation of nuclear power plants in accordance with the criteria of decision-making on the ad states «Emergency Preparedness» and / or «Emergency Situation» with followed by a message in the Emergency Centre (EC) of «Rosenergoatom». Shift supervisor of EC transmits the information to the head group of NPP emergency assistance (OPAS) .</p> <p>In case OPAS group manager makes decision to pick up members of OPAS group and put all systems of EC and TSC into fully active state in order to render emergency assistance to NPP, EC shift supervisor executes direction on assembly of OPAS group members in the time specified by regulation, actuation of communication systems, SHC of Crisis center and technical support centers (TSC). Recommendations prepared by OPAS group are communicated to experts of EMC, who in turn, if accepted, send it to PSS, MCR operators.</p> <p>Emergency Technical Centers (ETC) – St. Petersburg and Novovoronezh are intended for execution of emergency technical and rescue works with the use of robotic tools, remotely controlled machines and mechanisms, special equipment directly at the site of NPP under emergency.</p>		
Q.No 238	Country Lithuania	Article Article 19.7	Ref. in National Report Page 127
Question/ Comment	<p>You indicated that in order to improve the NPP operational quality, the Operating organization uses a standard «Nuclear experience review and utilization. General provisions» (SRT 1.1.1.01.002.0646-2012).</p> <p>Hereinafter it is stated that, in order to detail the main provisions of this standard, both at the branch and at the plant levels in 2009, JSC «Concern Rosenergoatom» introduced a typical Administrative instruction on the analysis and use of NF at NPPs (AI 1.3.2.06.014.0017 -2008).</p> <p>Could you please clarify if the document dated 2008 had not to be reviewed in accordance with the requirements of the document issued (updated) in 2012?</p>		
Answer	Work in revision of AI 1.3.2.06.014.0017-2008 was organized by Operating organization in 2013. Completion of revision works of AI 1.3.2.06.014.0017-2008 will be in 2014.		
Q.No 239	Country Estonia	Article Article 19.8	Ref. in National Report page 129

Question/ Comment How will the spent nuclear fuel and radioactive waste from the Kaliningrad NPP be managed? In case of transportation of spent nuclear fuel and radioactive waste by sea, how will the safety of transport be ensured?

Answer For Baltic NPP power units the following is stipulated in accordance with design decisions:

- storage of SFA in SFP is carried out for 10 years to decrease radioactivity and heat emission of spent nuclear fuel (SNF), which simplifies and makes it safer to further handle SNF;
- since SNF is valuable material (95 % of initial energy potential is retained), in order to procure fresh NF (nuclear fuel) after storage of SNF is lapsed, it is sent to Krasnoyarsk mining and chemical plant for further treatment;
- removal of SNF, by using special TSP for SNF can be performed by any kind of transport: ground or air.

All activities with SNF, both process and transport exclude contact with environment and are only carried out in accordance with Federal standards and rules, particularly «Safety rules at storage and transportation of nuclear fuel at nuclear power utilization facilities» NP-061-05 and «Safety rules at transportation of radioactive materials» NP-053-04. These rules determine main technical and organizational requirements to the systems to NF storage and transportation systems aimed at ensuring safety at storage and transportation at nuclear power utilization facility.

SNF transportation route from Kaliningrad region by seaway through St. Petersburg is suggested.

After holding in spent fuel pool, spent nuclear fuel is removed from reactor compartment of NPP power unit by container car train intended for transportation of SNF from NPP territory with further reloading of containers into special marine vessel for shipping to the port of St. Petersburg and further to nuclear fuel regeneration plant by railroad train.

Only conditioned solid radioactive wastes (SRW) will be temporary stored at the territory of Baltic NPP Site. Liquid radioactive wastes are continuously treated in the process of units operation. Duration of storage of conditioned radioactive wastes (RAW) at the site, generally, is determined by the volume of transportation.

Presently transportation of radioactive wastes is determined in accordance with regulatory documents effective in RF ensuring safe transportation of RAW to burial site.

Specific RAW transportation routes from the territory of Baltic NPP to location of RAW burial site will be determined in working documentation.

Q.No 240	Country Lithuania	Article Article 19.8	Ref. in National Report Page 129 - 131
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Question/ Comment The I unit of the new NPP in Kaliningrad region will be constructed in the next 10 years according the report of Russian Federation (Article 18 Page 114). The overview on handling of spent fuel and radioactive waste on sites of operated nuclear facilities is presented in the Report, but there is no information about handling of spent fuel and radioactive waste on sites of planned to construct nuclear facilities.

Could you please provide specific information how radioactive waste and spend nuclear fuel from the NPP in Kaliningrad region will be managed and where it will be disposed to storage or disposal facility? If it will be some centralized storage or disposal facility (as it is written in the report), how spent nuclear fuel will be transported to it?

Could you specify the site and location planned for nuclear waste storage facilities and repositories?

When will these facilities be commissioned? Are the spent nuclear fuel and/or other radioactive waste from the new NPP in Kaliningrad region planned to be transported out of Kaliningrad region to other parts of the Russian Federation at any point of time?

Answer For power units under construction in accordance with design approaches the following is stipulated:

- storage of SFA in SFP is carried out for 10 years to decrease radioactivity and heat emission of spent nuclear fuel (SNF), which simplifies and makes it safer to further handle SNF;
- since SNF is valuable material (95 % of initial energy potential is retained), in order to procure fresh NF (nuclear fuel) after storage of SNF is lapsed, it is sent to Krasnoyarsk mining and chemical plant for further treatment;
- removal of SNF, by using special TSP for SNF it can be performed by any kind of transport: ground, water or air.

All transactions with SNF, both technological and transport, eliminate contact with the environment and are carried out only in accordance with federal rules and regulations, in particular with the «Rules of safety during storage and transportation of nuclear fuel at nuclear facilities» NP-061-05 and «safety Regulations for transportation of radioactive materials» NP-053-04. These rules establish the main technical and organizational requirements for storage and transport of nuclear fuel to ensure safety during storage and transportation of nuclear fuel for nuclear facilities.

RAW will be garbage in special containers to regional enterprise storage of radioactive waste. Designing such storage is carried out by the State Corporation «Rosatom» at a special government program on radioactive waste management.

Planned commissioning dates regional RAW disposal facility - in 2016.

For Baltic NPP SNF and RAW as described above.

It is proposed route of transportation of spent nuclear fuel from Kaliningrad sea through St. Petersburg.

Spent nuclear fuel (SNF) after exposure to the fuel pool exported from the reactor compartment NPP car - echelon container for shipment of spent nuclear fuel from NPP site, and transshipment of containers to a specialized marine vessel for delivery to the port of St. Petersburg and further railway echelon on the nuclear fuel reprocessing plant.

Specific route transporting radioactive waste from the territory of the Baltic NPP to the burial site RAO defined in documentation.