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Resolution № 450
of the Georgian Government
August 27, 2015, Tbilisi
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On the approval of Technical Regulations - “Radiation safety norms and basic requirements related to handling of ionizing radiation sources"

In accordance with Article 53, Clause 6, Sub-clause “f” of the Georgian Law on "Nuclear and Radiation Safety" and Article 25 of the Georgian Law on “Regulations and Standards”:

Article 1

To approve the enclosed Technical Regulation – “Radiation safety norms and basic requirements related to handling of ionizing radiation sources“.

Article 2

To be declared invalid:

a) Resolution # 28 of January 3, 2014 of the Georgian Government on approval of "Technical Regulations - radiation safety standards in the territory of Georgia”;

b) Resolution # 34 of January 3, 2014 of the Georgian Government on approval of "Technical Regulations - basic sanitary rules of working with the radioactive substances and other sources of ionizing radiation”.

Article 3

The resolution shall become effective upon promulgation.

Prime Minister of Georgia *Irakli Gharibashvili*

Technical Regulations

Radiation safety norms and basic requirements related to handling of ionizing radiation sources

Chapter I. General Provisions

Article 1. Goals and Objectives

1. The present Technical Regulations have been developed in accordance with laws of Georgia on "Nuclear and Radiation Safety", ”Licenses and Permits", "Environmental Protection "," Public Health" and in compliance with the international standards on nuclear and radiation safety.
2. Technical Regulations shall determine:

a) Requirements related to control and security of the sources of ionizing radiation;

b) Basic safety standards for the protection of workers, public, patients and other individuals exposed by the medical irradiation and from threat imposed by ionizing radiation;

c) Requirements related to control, security and general awareness with regard to sources of ionizing radiation in emergency exposure situation;

d) Requirements to avoid harmful effects caused by ionizing radiation and to protect workers and public from the exposure of uncontrolled and inappropriately controlled highly active sealed sources;

e) Permissible levels of radionuclides concentration in potable and mineral water, raw material and soil;

f) Radionuclides concentration levels in products designed for building materials and construction.

Article 2. Scope of Regulation and Objectives

1. Standards and requirements under the Technical Regulation are mandatory for all those physical and / or legal entities irrespective of their organizational and legal status, whose activities are regulated by the Law of Georgia on Nuclear and Radiation Safety.
2. Standards and requirements under the Technical Regulation apply to the planned, emergency and existing exposure situations.
3. For the purpose to avoid and limit risks from exposure of ionizing radiation sources, Technical Regulations establish requirements for radiation safety system, which are based on the fundamental principles of radiation safety.
4. Technical Regulations determine requirements for the protection of workers and public from the radiation, namely:

a) Exposure dose limits, limited doses, reference levels for individuals involved in nuclear and radiological activities;

b) Exposure dose limits and intervention levels for individuals (nuclear and radiation activity license holders, emergency medical personnel, emergency response and other entities), which are involved in the interventions of nuclear and radiation accidents or incidents;

c) Exposure dose limits in existing exposure situations for which the regulatory body has made a decision (natural background radiation, and / or past exposure from previous activities and / or other emergency situation) on the implementation of the control measures.

5. Technical regulations shall not apply to the sources of ionizing radiation, which are withdrawn, cleared and / or exempt from regulatory control in accordance with the current legislation.

Article 3. Definitions of terms used in Technical Regulations

1. **Emergency exposure situation**– An emergency exposure situation is a situation of exposure that arises as a result of nuclear and radiation accident, a malicious act, or any other unexpected event, and requires prompt action in order to avoid or reduce adverse consequences.
2. **Emergency worker**– A person who participates in the process of radiation accident response activities, and may be exposed to radiation dosage exceeding the permissible limit determined for workers or for the public.
3. **Existing exposure situation**– An existing exposure situation is a situation of exposure that already exists when a decision by the regulatory body on the need for control needs to be taken.
4. **Activity** – The quantity A for an amount of radionuclide in a given energy state at a given time, defined as:

$$A(t)=dN/dt,$$

where dN is the expectation value of the number of spontaneous nuclear transformations from the given energy state in the time interval dt. The SI unit of activity is the reciprocal second (s-1), termed the Becquerel (Bq).Non-system unit is Curie: 1Ci =3.7.1010 Bq.
5. **Minimum value of activity** – activity of unsealed source of ionizing radiation in the workplace, which will be determined by the occupational class, if a minimal specific activity is exceeded.
6. **Natural exposure** – irradiation imposed by a natural exposure.

7. **Exempt waste –** radioactive waste that is released from regulatory control in accordance with exemption principles.

8. **Investigation level:** The value of a quantity such as effective dose, intake, or contamination per unit area or volume at or above which an investigation should be conducted.

9. **Relocation** – The non-urgent removal or extended exclusion of people from a contaminated area to avoid chronic exposure. Relocation can be temporary or permanent. Relocation is considered to be permanent relocation if it continues for more than a year or two and return is not foreseeable; otherwise it is temporary relocation.

10. **Low level waste:** Radioactive waste with radiological characteristics exceeding those of exempt waste and include limited number of long lived radionuclides or short lived radionuclides with high concentrations.
11. **Planned exposure situation**– planned exposure situation is a situation of exposure that arises from the planned operation of a source or from a planned activity that results in an exposure from a source.
12. **Exposure** – impact of ionizing radiation on human.
13. **Protective zone** – a special area territory with particular application regime, which is set around the facilities with high radiation risks.
14. **Sealed radioactive source**– Radioactive material that is permanently sealed in a capsule, or closely bonded and in a solid form.
15. **Decontamination** – The complete or partial removal of contamination by a deliberate physical, chemical or biological process.
16. **Deterministic effect**– A health effect of radiation for which generally a threshold level of dose exists above which the severity of the effect is greater for a higher dose.
17. **Diagnostic reference level** – A level used in medical imaging to indicate whether, in routine conditions, the dose to the patient or the amount of radiopharmaceuticals administered in a specified radiological procedure is unusually high or unusually low for that procedure.
18. **Dose** – measure of the energy deposited by ionizing radiation in a target, including absorbed dose, committed equivalent dose, committed effective dose, effective dose, equivalent dose or organ dose, as indicated by the context.
19. **Organ or tissue dose** (DT) – The average dose absorbed by specific organ or tissue of the human body:

$$D_T = (1/m_T)\int_{m_T} D\,dm\,,$$

Where mT is the organ or tissue mass, and D - the absorbed dose in the mass element dm .
20. **Evacuation** –rapid, temporary removal of people from an area to avoid or reduce short term radiation exposure in an emergency.
21. **Equivalent dose** (HT,R) – dose absorbed by human tissue or organ multiplied by weighting factor of the relevant radiation quality, WR:

$$H_{T,R} = W_R \times D_{T,R},$$

where $D_{T,R}$ is the absorbed dose delivered by radiation type R averaged over a tissue or organ T and wR is the radiation weighting factor for radiation type R. Equivalent dose is a measure of the dose to a tissue or organ designed to reflect the amount of harm caused.

When the radiation field is composed of different radiation types with different values of wR the equivalent dose is:

$$H_T = \sum_R H_{T,R}.$$

The unit of equivalent dose is the sievert (Sv), equal to 1 J/kg.

22. **Equilibrium equivalent concentration** (Specific activity) (EEC) –^{222}Rn or ^{220}Rn Radon isotopes progeny - weighted sum of the volumetric activity of short lived radon isotopes progeny – 218Po (RaA), ^{214}Pb (RaB), ^{214}BI (RaC), ^{212}Pb (ThB), ^{212}Bi (ThC), respectively:

$$(EEC)_{Rn} = 0{,}10\ A_{RaA} + 0{,}52\ A_{RaB} + 0{,}38\ A^{RaC},$$

$$(EEC)_{Th} = 0{,}91\ A_{ThB} + 0{,}09\ A^{ThC},$$

Where A_{Ra}, A_{Th} are volumetric activities of radon isotopes progeny.

23. **Effective (equivalent) annual dose**–the dose due to external exposure in a year plus the committed dose from intakes of radionuclides in that year. Internal exposure is caused by access of radionuclides into the body at the same years. Annual effective dose unit of measure is sievert (Zv).

24. **Non-fixed contamination** – Contamination caused by radioactive substances, which can be transferred to other objects in case of contact and can be removed during contamination.

25. **Fixed contamination** – Contamination caused by radioactive substances, which cannot be transferred to other objects in case of contact and cannot be removed during contamination.

26. **Personal protective equipment** – clothing, garments or other equipment designed to protect worker from external irradiation, access of radioactive substances into the body and skin surface from contamination.

27. **Collective effective dose**– total radiation dose incurred by a population. This is the sum of all of the individual doses to members of the population. Unit of measure of collective effective dose is man sievert (man Sv).

28. **License** – license for nuclear and radiation activities.

29. **Licensee**–a person authorized on the basis of the administrative and legal act to carry out nuclear and radiation activities.

30. **Heat generating waste (HGW)**: Radioactive waste which is sufficiently radioactive that the decay heat significantly increases its temperature and the temperature of its surroundings.

31. **Committed dose**– The lifetime dose expected to result from exposure.

32. **Action level** – The level of dose rate or activity concentration above which remedial actions or protective actions should be carried out in existing or emergency exposure situations.
33. **Emergency action level, EAL**– A specific, predetermined, observable criterion used to determine emergency class for I, II and III threat category installations.
34. **Potential exposure**– Prospective exposure that is not expected to be delivered with certainty but that may result from an anticipated operational occurrence, accident at a source or owing to an event or sequence of events of a probabilistic nature, including equipment failures and operating errors.
35. **Projected dose**– The dose that would be expected to be received if planned protective actions were not taken.
36. **Radioactive waste management**– Unity of radioactive waste handling and organizational measures.
37. **Representative person**– An individual receiving a dose that is representative of the doses to the more highly exposed individuals in the population.
38. **Spent source**– A source that is no longer suitable for its intended purpose as a result of radioactive decay.
39. **Reference level**– level of dose, risk or activity concentration above which it is not appropriate to plan to allow exposures to occur and below which optimization of protection and safety would continue to be implemented. The chosen value for a reference level will depend upon the prevailing circumstances for the exposure under consideration. In an emergency exposure situation or an existing exposure situation optimization shall be applied even if the initial doses/ exposures are less than the reference level.
40. **Operation category** – Description of operation with unsealed sources of ionizing radiation according to the degree of potential danger, which determines requirements of the radiation safety.
41. **Intermediate level waste** –radioactive waste which contains significant levels of long lived radionuclides, that's why it is necessary to bury and isolate these wastes in more reliable conditions than it is provided for a surface burial.
42. **Stochastic effect** – radiation induced health effect, the probability of occurrence of which is greater for a higher radiation dose and the severity of which (if it occurs) is independent of dose.
43. **Relative biological effectiveness (RBE)** –Low linear energy transfer radiation dose ratio to the exposure dose, which creates identical biological effect. RBE value substantially depends on the dose, dose-capacity and the biological effect.
RBE-weighted absorbed dose – product of dose absorbed by organ or tissue and RBE of exposure:

$$AD_T = \sum_R D_{R,T} \times RBE_{R,T},$$

where $D_{T,R}$ is the absorbed dose delivered by radiation of type R averaged over a tissue or organ T and $RBE_{R,T}$ – relative biological effectiveness (RBE) in specific tissue or organ T. The unit of RBE weighted absorbed dose is the gray (Gy), equal to 1 J/kg.

Expected RBE-weighted absorbed dose, $AD_T(t)$ - is used as an internal absorption characteristic and is expressed by the formula:

$$AD_T(\tau) = \int_{t_0}^{t_0+\tau} \dot{AD}_t(t)dt,$$

where t_0 – time of transfer, $AD_T(t)$ – RBE-weighted absorbed dose capacity in t time period in T organ or tissue, and t – time passed after transfer of radioactive material.

44. **Unsealed source** – A source that does not meet the definition of a sealed source.

45. **Dose constraint** – source related value of individual dose that is used in planned exposure situations as a parameter for the optimization of protection and safety for the source.

46. **Absorbed dose (D)** – value of energy imparted by ionizing radiation to matter:

$$D = \frac{d\bar{E}}{dm},$$

where $d\bar{\varepsilon}$ is the mean energy imparted by ionizing radiation to matter in a volume element and dm is the mass of matter in the volume element. The energy can be averaged over any defined volume, the average dose being equal to the total energy imparted in the volume divided by the mass in the volume. In SI-system the unit for absorbed dose is joule per kilogram (J/kg), given the name gray (Gy).

47. **Intervention level**– The level of avertable dose at which a specific protective action or remedial action is taken in an emergency exposure situation or existing exposure situation.

48. **Operational intervention level (OIL)**– A calculated level, that corresponds to one of the general criteria and is used to determine relevant protection and response measures.

49. **Very low level waste (VLLW):** Radioactive waste that can be buried along with ordinary radioactive waste and do not require special conditions for burial.

50. **Annual limit on intake (ALI)** – The intake of a given radionuclide in a year by a human which, under monofactorial actions, would cause exposure of a representative person to a committed dose equal to the annual relevant dose limit.

51. **Short lived waste** - Radioactive waste that does not contain significant levels of radionuclides with half-life greater than 30 years. Typical characteristics are restricted long lived radionuclide concentrations (limitation of long lived radionuclides to 4000 Bq/g in individual waste packages and to an overall average of 400 Bq/g per waste package).

52. Other terms used in these Technical Regulations have the same meaning as those in the Law of Georgia on "Nuclear and Radiation Safety".

Chapter II. GENERAL REQUIREMENTS FOR RADIATION PROTECTION

Article 4. Core principles and approaches for radiation protection and safety

1. Implementation of the requirements under the Technical Regulations provides protection of humans and the environment from exposure to ionizing radiation. This goal shall be achieved without unreasonable restrictions to nuclear and radiation activities.
2. Radiation protection and safety system aims to evaluate impact of exposure, management and control, to ensure that the radiation risks are reduced down to reasonably achievable lowest level.
3. Radiation protection and safety system is based upon the fundamental principles of nuclear and radiation safety stipulated by the Georgian law on,, Nuclear and Radiation Safety":

a) Justification principle – it is inadmissible to implement any type of activities without their justification. Justified is any activity related to sources of ionizing radiation, during which the derived benefit for individual and the community outweighs the possible caused harm. Justification principle should be considered at the stage of designing new radiation facilities and radioactive sources, granting a license, during agreement of documentation for application of ionizing radiation sources and during modification of the operating conditions under the license. In case of nuclear and radiation accident, justification principle is used with regard to the protection measures;

b) Optimization principle - individual radiation doses and the number of exposed persons must be minimized to the possible lowest level, considering the economic and social factors. Technical and organizational requirements and reference values must be determined for the purpose of optimization (dose constraints, reference levels), which will restrict the exposure doses and the related risks. In case of nuclear and radiation accident, optimization principle relates to protection measures to avert the exposure dose and potential damage. Averted dose and damage are associated with intervention, when general response criteria act instead of the dose limits;

c) Normalization principle (limiting risk for certain individuals) - It is prohibited to exceed the permissible dose limits of individual exposure. Ensuring avoidance of any impermissible risk or injury/damage to certain individuals by implementing radiation risk controls, which imply that dose limits for the determined total dose for workers, students/apprentices and public shall not be exceeded. This principle does not apply to persons who are exposed to medical procedures (medical radiation) and during interventions;

d) Safeguards for reducing the current and non-regulated radiation risks – the justification and optimization of safeguards to be implemented to reduce the current and non-regulated radiation risks;

e) Physical security (defense) principle – safeguards of the State against any unauthorized use or misuse, misappropriation, and sabotage of nuclear and radiation materials, other sources of ionizing exposure, and know how, furthermore, the avoidance of terrorist acts, unauthorized transportation of nuclear and radiation materials, any possible harm during the retention and transportation thereof. The basis for physical security (defense) on the part of the State is the piecemeal national requirements arising from assessments of potential hazards.

4. The following practices are deemed to be not justified:

a) Practices, (except for justified practices involving medical exposure) that result in an increase in activity, by the deliberate addition of radioactive substances or by activation, in food, feed, beverages, cosmetics, toys, jewelry or any other commodity or product intended for ingestion, inhalation or percutaneous intake by, or application to, a person;

b) Human imaging using radiation applied as a form of art or for publicity purposes, for health insurance, prevention of crime of for the purpose of investigation.

5. Human imaging using ionizing radiation for the purpose to prevent crime or for investigation is deemed to be justified provided the following requirements are met:

a) In case of a single inspection, dose constraint for imaging exposure should not exceed 1 mSv;

b) Persons who are to undergo inspection shall be informed of the alternative inspection technique, doses of exposure and the related risk;

c) Re-inspected cases shall be under mandatory registration and dose-related data being provided to the regulatory body;

d) If the accumulated exposure dose exceeds 10 mSv in a year, it is necessary to record the data and provide them to the regulatory body.

Article 5. Main exposure situations

For the purpose to introduce requirements based on the fundamental principles of radiation safety and protection into practice, three types of exposure situations have been identified: planned exposure situation, emergency exposure situation and existing exposure situation. For these situations in the radiation protection system dose limits, dose constraints and reference levels are established.

Article 6. Main criteria for exemption and clearance

1. Exposure is exempted from the regulatory control, if in terms of principles of justification, it is deemed to be unamenable to control:

a) Exposure from cosmic radiation;

b) ^{40}K exposure to human body that it is not feasible to control;

c) Exposure from radionuclides of natural origin, if their concentration does not exceed the values given in Table 1;

d) Exposure from ionizing radiation generating sources (including e-beam tubes), if its maximum energy does not exceed 5 keV;

e) Ionizing radiation from generating devices, from the surface of which at a distance of 0.1 meter at any point, under normal operation, the dose capacity does not exceed 1 mSv per hour.

Table 1. Levels for clearance of radionuclides of natural origin

N	Radionuclide	Activity concentration (Bq/g)
1	^{40}K	10
2	All radionuclides of natural origin except ^{40}K	1

2. Exempted is a source of ionizing radiation and / or the radionuclide-containing subject prior to its use and / or activity (or its part) prior to its implementation. Exemption criteria for the radionuclide-containing subject represent annual effective dose of 10 mSv. Ionizing radiation source is exempted, if there is a possibility that annual effective dose from the moment of source application does not exceed 1 mSv. One of the limits of exemption for source of ionizing radiation and / or radionuclide-containing subject is an equivalent annual dose of the order of 50 mSv on human skin. Collective dose of 1 man*sievert may also be used to a determine level of exemption.

3. Exempted are radioactive substances the activity of which does not exceed the values given in Appendix 1 of the Technical Regulations.

4. Source of ionizing radiation may exempted, if it had already been under regulatory control. Exemption of radioactive sources is done, if the received annual effective dose does not exceed 10 mSv. Exemption levels for radionuclides-containing volumetric subjects are shown in Table 3 of Appendix 1.

5. The site for nuclear and radiation installations, including the building/facilities, may be exempted if its effective annual dose proportion for public (dose constraint) does not exceed 300 mSv, provided that the total annual effective dose does not exceed 1 mSv. Site for nuclear and radiation facilities may be subject to conditional exemption; in this case the regulatory authority must determine conditions (restrictions), the use of which will provide the appropriate dose limits.

6. In some specific cases of exemption and clearance of site for nuclear and radiation installations, the licensee shall develop a justified scenario, which may serve as a basis for calculation of the radionuclide activities (specific activities) considering the above-mentioned criteria.

7. Scenario defined in Clause 6 of this Article should be agreed with the regulatory body. In such case, the values resulted from calculation in the decision-making process will supersede the values given in Appendix 1.

8. The regulatory body has the right to determine exemption and clearance levels and to decide on clearance for the site of nuclear and radiation installations in each individual case. To determine exemption and clearance of subjects with non-fixed contamination, tenfold meaning of values given in Table 3 of Appendix 1 (dimensions Bq / cm ^{2}) may be applied.

Article 7. The main dose limits. Dose constraints and reference levels

1. The present Article defines:

a) Main dose limits of exposure;

b) Dose constraints and reference levels;

c) Permissible levels of monofactorial exposure (for external exposure of one type or radionuclide, and ways of intake by human body), which represent values generated from main dose limits of exposure: annual limit on intake, permissible annual average volumetric activity, average annual specific activity, etc.

2. Requirements of Technical Regulations are applicable to all exposed persons in the following categories:

a) Workers;

b) Public and those employees who do not carry out their professional activities during exposure.

3. Ensure protection of dose limits for avoiding deterministic effects and reducing the likelihood of stochastic effects due to public exposure.

4. For occupational exposure of workers, public and apprentices of 16 to 18 years of age who are being trained for employment involving radiation and exposure, the main dose limits are provided (Table 2). These doses do not include medical and natural radiation doses, as well as doses resulting from nuclear and radiation accident.

5. In case of simultaneous external and internal exposure to human, annual effective dose should not exceed the dose limits given in Table 2.

6. Main dose limits for workers and public imply exposure from both, man-made and natural sources, which are not exempted from regulation.

7. Persons exposed in planned situation with increased radiation level exceeding 50 mSv effective dose per year, should not intake effective dose exposure more than 100 mSv in the five consequent years.

8. Annual effective or equivalent dose caused by man-made sources shall not to be exceeded under normal conditions of operations.

9. In special circumstances a higher value of effective dose in a single year can be applied for public (Table 2), provided that the average effective dose for the next five years does not exceed 1 mSv per year.

Table 2. The main dose limits

Standard values	Dose limits		
	Workers	Persons from 16 to 18 years of age	Public
Effective dose	20 mSv per year On average in the next 5 year (100 mSv.- 5 years), but not more than 50 mSv for any single year	6 mSv per year	1 mSv per year In special circumstances, a higher value of effective dose in a single year could apply, provided that the average effective dose over five consecutive years does not exceed 1 mSv per year;
The equivalent dose in lens per year	20 mSv On average in the next 5 year (100 mSv.- 5 years), but not more than 50 mSv for any single year	20 mSv	15 mSv
On skin*	500 mSv	150 mSv	50 mSv
On hands and feet	500 mSv	150 mSv	50 mSv

* For skin -equivalent dose limits for the skin apply to the average dose over 1 cm^2 of the most highly irradiated area of the skin.

**Special circumstances – transitory increases in exposures in planned operational circumstances.

10. For persons who has accumulated dose of one type of exposure that exceeds 0.5 Sv, dose recovery (reconstruction) shall be provided from other types of exposure.

11. Public annual exposure dose should not exceed the main dose limits (Table 2), which is defined as an average annual effective dose of a representative person and represents a sum of the relevant doses from external exposure in 70-year period and the relevant committed doses in the same period.

12. Annual exposure of workers represents sum of the relevant doses from external exposure in 50-year period and the relevant committed doses from intakes in the same period and it shall not exceed main dose limits (Table 2).

13. Doses per unit intake (dose coefficients) for the estimation of the committed effective dose for ingestion and inhalation of radionuclides for workers and public are given in Appendix 2.

14. For all workers, effective dose caused by natural exposure during production activities shall not exceed 5 mSv per year. If this value is exceeded, the optimization of protection should be provided for each worker on an individual basis.
15. In situation of discharge of radioactive substances into the atmosphere and water basins, dose constraints are set so that their limit value does not exceed 0.1 mSv per year. In this case, the annual dose limit will be maintained for public, which makes 1 mSv per year (Table 2).
16. Exposure of embryo or fetus of a pregnant woman, who works with sources of ionizing radiation, and after she notifies the employer of her pregnancy, should be limited by changing the labor conditions the way that during the remaining period of gestation, sum of effective dose of external exposure and committed effective dose of internal exposure to the fetus does not exceed 1 mSv per year.
17. Employers shall provide female workers who are liable to enter controlled areas or supervised areas or who may undertake emergency duties, with appropriate information on the risk to the embryo or fetus due to external exposure of a woman, as well as through ingestion of radionuclides.
18. An employer who is informed of woman's pregnancy or breastfeeding shall ensure appropriate labor conditions for such woman in relation with occupational exposure, to protect fetus and newborn at a protection level determined for the members of the public.
19. Additional restrictions are introduced for women below 45 years of age which are working with sources of ionizing radiation: equivalent dose exposure to the lower part of abdomen/pelvis surface should not exceed 1 mSv a month, while annual radionuclides body exposure shall not exceed 1/20 of annual limit established for workers. Equivalent dose of exposure to fetus in unidentified two-month pregnancy conditions shall not exceed the equivalent dose - 1 mSv. For this purpose in case of simultaneous internal and external exposure main dose limits must be ensured (Table 2).
20. Main dose limits values shall not be considered during the decision-making on potential radiation control, as well as in case of implementation and procedure of the intervention.
21. Dose limit of external exposure is specified for the same case of exposure as the main dose limits for workers, but is expressed in units available for measurement:

a) For weakly penetrating individual exposure equivalent dose at a depth of 0,07 mm of 500 mSv per calendar year;

b) For individual equivalent dose at a depth of 10 mm of 20 mSv in a calendar year.

22. Internal exposure dose limit for workers, apart from radon and uranium-radium radionuclides exposure cases, is expressed by the following value:

a) Ingestion of radionuclides - dose limit – ratio of 20 mSv to conversion coefficient of radionuclides ingestion by a worker’s body (According to Appendix 2);

b) Inhalation of radionuclides - dose limit – ratio of 20 mSv to conversion coefficient of radio-nuclides penetration into a worker’s body through inhalation (According to Appendix 2).

23. In case of simultaneous internal and external exposure in a calendar year, main dose limits for a worker will not be exceeded, in case of the following conditions:

And if:

$$Hp\ (10) + \Sigma hj,inhIj,inh + \Sigma hj,ingIj,ing \leq 20mSv$$

where, HP(0,07) or HP(10) – is annual individual equivalent dose at depth of 0,07 mm or 10 mm. IJ,inh or Ij,ing is j inhalation or ingestion of radionuclides per year; hj,inh or hj,ing is j radionuclide conversion coefficient in a worker's body through inhalation or ingestion(Appendix 2).

24. In case of whole body, skin and lens exposure by homoenergetic electrons, photons and neutrons, as well as by beta-particles, annual average allowable values of equivalent doses and particle flow density are given in Annex 3.

25. Dose constraints and reference levels are used for the optimization of radiation protection and safety. Dose limit is focused on restriction of risk or individual dose from single source in planned exposure conditions (except for medical exposure). Dose constraints are not dose limits. They, as a rule, are less and applied for planning of protective measures. During optimization of protection, dose constraint from each source makes 0.1 mSv per year.

26. Dose constraints and reference levels applied in radiation protection system are determined in Table 3:

Table 3. Dose constraints and reference levels applied in radiation protection system

Exposure situation	Occupational exposure	Public exposure	Medical exposure
Planned exposure	Dose limit Dose constraint	Dose limit Dose constraint	Diagnostic reference level *** (Dose constraint)****
Emergency exposure	Reference level*	Reference level	N/A
Existing exposure	N/A **	Reference level	N/A

*Long-term post-accident elimination works are considered as a part of planned occupational exposure.

** Long-term elimination works after the accident, as well as a long recovery period, or operations in contaminated areas are considered as part of a planned occupational exposure, even if the radiation source is considered available/existing.

*** Patients

**** Patients' carers and comforters and volunteers participating in research activities.

27. For occupational exposure, the dose constraint is a value of an individual dose. During occupational exposure, they should use such option of the protection, which will generate a dose less than the dose constraint and which will be taken into account (considered) in the optimization process.
28. For public exposure, the relevant dose constraint is an annual upper limit, which can impact the public from planned operations of the specific source under control.
Risk constraint is consistent with dose constraint and applies to potential exposure. Dose constraint shall be determined for any source, which could lead to discharge of radioactive material into the environment, so that the expected annual dose for the population (including future generations) shall not exceed the dose limits (Table 2). For dose determination, exposure doses received from any routes are summed up.
29. During the medical exposure dose constraints are values of exposure dose related to a certain source and are used in optimization of protection and safety for 'carers and comforters' and for volunteers subject to exposure as part of a program of biomedical research.
30. Reference levels are used for optimization of protection and safety in emergency exposure situations and in existing exposure situations. The reference level represents the level of dose or the level of risk above which it is judged to be inappropriate to plan to allow exposures to occur, and below which the optimization of protection and safety is implemented.
31. In X ray medical imaging, image guided interventional procedures and diagnostic nuclear medicine, a diagnostic reference level is used to indicate the need for an investigation. Periodic assessments are performed of typical doses or activity of the radiopharmaceuticals administered in a medical facility. If comparison with established diagnostic reference levels shows that the typical doses or activity of the radiopharmaceuticals administered are either too high or unusually low, a local review is to be initiated to ascertain whether protection and safety has been optimized and whether any corrective action is required.
32. During preventive medical x-ray exposure and examination of healthy individuals, annual effective dose should not exceed 1 mSv. Decision on probable temporary excess of preventive radiation doses is made by the Ministry of Labor, Health and Social Affairs, based on epidemiological conditions.

Chapter III. PLANNED EXPOSURE SITUATIONS

Article 8. General requirements

1. In planned exposure situations, associated exposures and their probabilities of occurrence can be restricted from the outset. The primary means of controlling exposure in planned exposure situations is by good design of installations, equipment, operating procedures and proper selection of personnel.

2. Long-term elimination works after the accident, as well as a long recovery period, or operations in contaminated areas are considered as part of a planned occupational exposure, even if the radiation source is considered available/existing.
3. In planned exposure situation, requirements are set in compliance with the law of Georgia on “Nuclear and Radiation Safety" for the following practices:

a) Production, possession, storage, use and consumption, import, export, transit and transportation of radioactive materials, as well as import and export of nuclear technologies and know-hows;

b) Selection of land/site for nuclear and radiation facilities, design, evaluation of radiation safety, modification of practice or project activities, decommissioning of nuclear and radiation facilities;

c) Processing, storage - warehousing and disposal of radioactive waste;

d) Application of ionizing radiation sources for medical, industrial and scientific research purposes;

e) Any other practices related to sources of ionizing radiation (including commissioning of nuclear and radiation facilities, maintenance, mining-related activities).
4. Requirements to the planned exposure situation apply to:

a) Exposure from a specific source within practices listed in Clause 3 of this Article;

b) Exposure due to any radionuclides, such as uranium or thorium with specific activity greater than 1 Bq/g or the activity concentration of ^{40}K is greater than 10 Bq/g;

c) Public exposure delivered by discharges or in the management of radioactive waste arising from a practice involving material;

d) Exposure due to ^{222}Rn and its progeny and ^{220}Rn and its progeny in workplaces in which occupational exposure due to other radionuclides in the uranium or thorium decay chains is controlled as a planned exposure situation;

e) Exposure due to ^{222}Rn and ^{222}Rn progeny where the annual average activity concentration of radon in air in the workplace remains above the reference level established in accordance with Chapter 6 as an existing exposure situation.

Article 9. Responsibilities of licensees in planned exposure situations

1. In planned exposure situation, regulation and control under the law of Georgia on “Nuclear and Radiation Safety" is carried out through authorization and inspection.
2. In planned exposure situation, the licensee shall:

a) Ensure nuclear safety and radiation protection and exercise control over the radioactive waste arising from the relevant activities and to protect public and environment from harmful exposure to radioactive waste in compliance with requirements of the Georgian legislation;

b) Ensure consideration of all the factors for radiation protection and safety for optimization;

c) Determine the radiation protection and safety measures, which will be optimized in the relevant settings, determine their likelihood, nature and magnitude of exposure;

d) Establish criteria, on the basis of the optimization results, for the restriction of likelihood and magnitudes of exposures by means of measures for preventing accidents and for mitigating the consequences of those that do occur;

e) Determine performance conditions for dose limits and reference levels for specific activity and in agreement with the regulatory authority to implement them in practice;

f) Present justified guarantees that impact from any permitted activities will be limited in such a way that neither effective nor an equivalent dose exposure to human tissue and / or the organ will exceed the established dose limits (Table 2);

g) Ensure nuclear and radiation safety of the sources of ionizing radiation at all stages of their handling through engineering and organizational requirements: from the moment of purchase, through siting , design, construction, commissioning, maintenance and decommissioning;

h) Provide compliance of the purchased equipment containing a source of ionizing radiation with the requirements of applicable law and the accepted international standards.

3. In the event of violation detected during implementation of activities, the licensee shall:

a) Notify the regulatory authority of the violation and / or emergency or expected occurrence of the event;

b) Investigate causes and consequences of the violation;

c) Take measures to eliminate the consequences of nuclear and radiation accident and for their subsequent prevention. The licensee shall submit a written report to the regulatory authority on causes of the violation and measures taken to eliminate consequences of the accident.

Article 10. Occupational exposure in planned exposure situations

1. In the process of implementation of nuclear and radiation activities, workers shall be protected from the harmful effects of ionizing radiation. Licensee shall establish and enforce all optimization measures required to protect workers from exposure in the planned exposure situations.

2. In case of implementation of any activity (production, transportation, services), except use of exempted (Appendix 1) sources, occupational exposure shall be under appropriate control.

3. The following conditions shall be provided for the nuclear and radiation safety:

a) Justification and optimization of the activities presented for authorization (justification must imply evaluation of exposure doses for workers and the public);

b) Development of appropriate measures to implement optimization principle;

c) Monitoring over radiation control to follow permissible dose limits for workers and public.

4. According to the requirements of the Georgian legislation, persons over the age of 16 years with no medical contraindications are allowed to be involved in operations with occupational exposure. For the purpose to comply with the dose limit, constant radiation control should be provided (Table 2).

5. If exposure of a worker exceeds 50 mSv (annual dose limit), such exposure shall be considered as a special circumstance and activity can be extended provided that the licensee and the regulatory authority, with the consent of the worker, jointly determine temporary restrictions of the permissible dose and duration of this limitation.
6. A person with effective dose of planned exposure over 200 mSv per year should be removed from the exposure zone and subject to medical examination. Further return of this person back to his work shall be decided on an individual basis, results of the medical examination and the person's consent.
7. A person exposed to radon in the workplace with annual average activity concentration exceeding 1000 Bq / m3 in atmospheric air, is subject to the limitation of occupational exposure dose limits.
8. Exposure dose limits apply to all workers. Special permissible dose limits for pregnant women are set for the protection of fetus and are stipulated in Article 7, Clauses 16 and 18, of these Regulations. Licensee is responsible for compliance with the permissible dose limits.
9. The licensee is responsible for part-time and temporary workers in terms of radiation protection and safety. Prior to recruitment, these persons shall submit registration cards indicating doses received by them in the past.
10. Workers referred to in paragraph 9 of this Article, shall receive instructions and training, if necessary, prior to recruitment, which must be executed in writing. The licensee is obliged to inform the employee of his obligations and protection methods, activity-specific safety measures (monitoring methods, methods to use special protection equipment, as well as with his obligation - to immediately inform the authorities of all the violations). The licensee may engage other person into the activities, if they have the proper license.
11. The licensee (employer) is required to, in order to achieve reasonably minimum levels of radiation, use all optimization measures of radiation protection aimed at reducing the exposure of workers.
12. Compliance of personal protection equipment with type of operation, category of source and class of hazard, is determined on the basis of documentation of the source manufacturer. The licensee is obliged to ensure regular monitoring of protection equipment at least once every two years, in order to determine the exposure attenuation coefficient.
13. Based on the specific scope of work, the licensee shall provide workers with personal protective equipment and appropriate monitoring tools.
14. The licensee is obliged to ensure periodic verification and calibration of the monitoring equipment in the prescribed manner.
15. Providing additional compensation to the worker, considering harmful impact of the operations, does not exempt the licensee from obligation to carry out optimization in compliance with nuclear and radiation safety requirements, against the exposure caused by these operations.

Article 11. Public exposure in planned exposure situation

1. In planned exposure situation, in order to limit public exposure, the licensee shall ensure the following:

a) Compliance with the statutory requirements under the Technical Regulations and other acts;

b) Implementation of optimization measures for protection and safety;

c) Limitation of exposure of the public in order to avoid exceeding the dosage rates;

d) Measures for ensuring the safety of such sources;

e) Provision for suitable and adequate resources for the protection and safety of the public;

f) Programs for appropriate training of personnel having functions relevant to protection and safety of the public and their practical application;

g) Provision for appropriate monitoring and surveillance equipment and methods for assessing public exposure;

h) Development of emergency plans, emergency response procedures;

i) Adequate records of surveillance and monitoring.

2. For limitation of exposure from man-made sources, the following actions shall be implemented: control over safety of operating procedures, physical protection of ionizing radiation sources, limitation of release and emission of radionuclides into environment, nuclear and radiation safety principles in the process of source design, construction, operation and decommissioning process.

3. In order to obtain authorization, a license applicant's documentation shall include protection measures for the determined dose limits for the population, risk-based evaluation of exposure.

4. In case when the source of ionizing radiation may cause external radiation exposure of the population, the licensee shall ensure:

a) Submit schemes of location of new facilities, equipment and layout of floors to the regulatory authority prior to the commissioning;

b) Determine dose limits for specific source and their agreement with the regulatory authority;

c) If necessary, implement additional shielding and other protective measures.

5. For the purpose to evaluate public exposure from external sources of radiation, the licensee shall monitor and record the results: release / discharge of radioactive waste into the environment, unforeseen growth of exposure level due to radioactive contamination or radiation accident. Evaluation of population exposure and if needed, implementation of appropriate measures shall take place based on the monitoring results.

Article 12. Requirements to controlled and supervised areas

1. For the purpose to reduce and optimize occupational exposure at a workplace, controlled and supervised areas must be established and delineated.

2. Licensee shall provide implementation of the following requirements with regard to the controlled and supervised zones:

a) Restricted access to the controlled area;

b) Delineation of areas, using warning symbols recommended by ISO 361 standards;

c) Written description of specific procedures within the area.

3. Type of restriction shall be based on the likelihood and magnitude of exposures.

In case the source is used in unsteady settings (field conditions, transportation, use of mobile devices or their activation in discontinuous mode) establishment and delineation of the controlled area shall be determined by the duration of exposure.

4. Licensee shall regulate access of worker to the controlled area through appropriate administrative measures, including special access system.

5. Allocation of the appropriate areas for smoking and eating. The licensee is obliged to ensure special decontamination facilities, which are specified in the license documentation.

6. In terms of work specificity, controlled area must be provided with the following:

a) At entrance – Personal protective equipment, equipment for individual monitoring and workplace monitoring, Suitable storage for personal clothing;

b) At exit– Equipment for monitoring for contamination of skin and clothing, Washing or showering facilities and other personal decontamination facilities, Suitable storage for contaminated personal protective equipment.

7. Periodical review and /or in case of change of working conditions and process, boundaries of controlled area as well as requirements to nuclear and radiation safety shall be reviewed and updated if necessary.

8. Persons working in controlled area shall have appropriate information, instruction and training.

9. Supervised area is designated to control occupational radiation exposure, even though specific measures for protection and safety are not normally needed.

10. Supervised area shall meet the following requirements:

a) Delineation of boundaries;

b) Display approved signs, at access points;

c) Periodic monitoring and if necessary, taking appropriate measures.

11. Periodical review and /or in case of change of working conditions and process, boundaries of supervised area shall be reviewed.

12. Dose limits identified beyond the supervised area are identical to those for public (1 mSv per year).

13. In case of visitors' (callers, attendees) access into the controlled and supervised areas, the licensee shall:

a) Ensure that visitors are accompanied in any controlled area by a person who knows the measures for protection and safety;

b) Provide adequate information and instructions to visitors before they enter a controlled area or a supervised area;

c) Ensure that adequate control is maintained over the movement of visitors within a controlled area or a supervised area, including relevant control over vehicles;

d) Provide protection measures in case of implementation of nuclear and radioactive actions at open sites, including control over access zones;

e) Establish specific provisions of confinement for the design and operation of a source that could cause spread of radioactive contamination;

f) Take appropriate protection measures in the areas that are accessible for public, providing radiation signs.

Article 13. General safety requirements to ionizing radiation sealed sources and generators

1. The radiation safety requirements are determined according to the categorization of ionizing radiation sources, which include harmful effects of ionizing radiation on human health and the likelihood of occurrence of deterministic effect. Categories of sealed and unsealed radioactive sources are defined according to the Regulation # 689 of December 19, 2014 of the Government of Georgia on approval of the ,, Technical Regulations - "development of departmental authorization registry and maintenance rules for sources of ionizing radiation, radioactive waste, and categorization of sources of ionizing radiation".
2. Handling procedures for the ionizing radiation sealed sources and generators are determined by the present Technical Regulations, state standards and the manufacturer's technical documentation.
3. For the commissioning - equipment, containing ionizing radiation generators and sources must comply with the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) standards.
4. In case of source purchase, the agreement shall include a term to guarantee return of the spent sealed source to the source manufacturer.
5. Requirements for quality control testing of radiation generators and radioactive sources (acceptance, long-term stability, performance tests) are determined by the relevant act.
6. All measures must be taken, including calibration and quality control to eliminate equipment-related technical malfunctions and gaps.
7. Quality control of ionizing radiation sources and generators (acceptance testing, maintenance and long-term stability test) includes the following:

a) Commissioning should take place after the acceptance test, in particular, determination of compliance of the source's technical parameters with the technical documentation and the established standards;

b) During the commissioning period of ionizing radiation sources, within the quality program, long-term stability test and performance test in systematic operation regime shall be conducted as per the Georgian legislation.
8. After modification or repair of the equipment, re-testing of the technical parameters should be carried out.
9. Containment control for the sealed sources shall comply with the relevant standards and rules and terms of the technical documentation. It is prohibited to apply a sealed source with a seal failure.

10. In case the test results fail to meet the requirements, commissioning of the generator shall not take place until the appropriate actions are taken.
11. Conspicuous area of the equipment shall be marked by the radiation hazard sign according to ISO 361 standard. All instructions related to the equipment operation, service, protection and security shall be developed in the state language.
12. After completion of work, it shall be checked if power to a generator is off, if it does not happen automatically.
13. Radiation dosage rate from the surface of mobile, portable and fixed equipment (flaw detectors, teletherapy gamma-apparatus, etc.), operation of which is based on the use of sealed sources, shall not exceed 20 mSv / hr within 1 m distance.
14. For the industrial radioisotope devices (sealed source), intensity of radiation dose from the surface of source containing unit, shall not exceed 100 mSv / hr, while for the distance of 1 m - 3 mSv / hr.
15. For the devices characterized by radiation from unused r-unit (electron beam tubes, except high-energy accelerators) – capacity of radiation dose shall not exceed 1 mSv / hr from their surfaces at a distance of 0.1 m.
16. Off mode sealed source should be placed in a protective device - a protective case or a container.
17. In case of storage of sealed radiation sources, dosage rate from the external surface of a warehouse/container should not exceed 1 mSv / hr.
18. Removal procedure of a sealed source from the container shall be conducted with a help of special remote instruments. During the operation, protective screens, manipulators shall be applied. In case the dosage rate is 2 mSv / hr at a distance of 1 m, special protective remote control devices (boxes, cabinets, etc.) should be used. Requirements under this paragraph shall not apply to emergency response operations.
19. I-II category sealed sources and high-energy generators (accelerators) shall be equipped with blocking systems and the source placement alarm system, as well as with coercive remote device to return the source back to the storage conditions.
20. I-II category sealed sources stored in underwater settings - protective tank must be equipped with automatic water level indicator and the level-change indicating alarm device.
21. The licensee shall ensure that application of portable and mobile x-ray and radiology equipment on premises that are not specifically designed for the radiological procedures shall be carried out only in cases where transportation of a patient is medically unjustified or unacceptable. In such cases it is necessary to provide protection measures.
22. During x-ray and radiology procedures, it is necessary to carry out shielding of gonads, lens, breast and other organs, and apply protective equipment as much as possible. In pediatric cases shielding should be applied all over the body, except for the examined area.
23. When working with sealed sources, for radiation protection, if needed, it is recommended to use both personal protective equipment (lead-containing aprons, gowns, gloves, masks, glasses), and special equipment (remote tools - tweezers, forceps, containers, etc.).

24. Transportation of radioactive sources within the agency should take place in containers and / or packaging, while transportation of highly-active sources – by special vehicles (trolley, crane and other) based on safety requirements.
25. I-II category sealed source - and high power generators- containing equipment must be placed in separate rooms of the building in an isolated area in compliance with the following requirements:

a) In case of any position of a source or propagation of radiation flow in any direction - walls, floor, ceiling shall ensure mitigation of primary and dispersed radiation on outer surface of the container/room walls and adjacent container/room down to dose rate of 1 mSv /sec;

b) Controls of this equipment must be placed in separate rooms (except dental viziography and mammography device);

c) Front door of the medical treatment room shall be blocked with moving the sealed source or high voltage generator switching mechanism;

e) In the case when the generator is controlled from its container, without the control room, protective fixed and portable screens shall be applied.

26. Sealed sources and generators facilities do not require special coating, although sanitary and hygienic norms should be followed. However, storage facilities of dismantled devices for re-discharge; repair and dismantling and I-II category dismantled equipment require cladding of the working surfaces, which allows for wet processing.
27. Operation facilities of I-II category sealed sources and high-energy generators shall be equipped with the relevant suction-exhaust ventilation mechanism.
28. For the purpose to prevent accumulation of toxic substances exceeding the permissible levels in the air of an operation zone, air-change sequence, temperature, light, humidity in the facilities shall be determined by standards and rules of sanitation and hygiene.
29. In case of malfunction, design of the medical device shall help to avoid or minimize unplanned exposure of the patient or a worker's error.
30. Design of the medical device shall ensure the least level of radiation and also the possibility of obtaining high-quality diagnostic information.
31. All medical radiation generators must be equipped with radiation beam control mechanisms, including identifying and blocking devices that will demonstrate on-off process of radiation flow in a continuous mode.
32. The irradiation equipment must be provided with the field limiting capacity, which will reduce unwanted (parasitic) dosage rate or dispersed radiation outside the area of diagnostics and treatment.
33. Design/project of radiation facility and the relevant changes must be agreed with the regulatory body.

Article 14. General safety requirements for ionizing radiation non-sealed sources

1. According to the minimum value of activity (MVA) radionuclides, as potential internal exposure sources are divided into 4 groups of radiation hazard:

a) Group A– radionuclides, minimum value of activity of which is 10^3 Bq;

b) Group B– radionuclides, minimum value of activity of which is 10^4 and 10^5 Bq;

c) Group C– radionuclides, minimum value of activity of which is 10^6 and 10^7 Bq;

d) Group D – radionuclides, minimum value of activity of which is 10^8 Bq and higher.

2. Radiation hazard group of radionuclide is determined based on Table 5, Annex 1 of the Technical Regulations. Short half-life radionuclides, half-life of which is less than 24 hours and are not referred to in this Annex belong to Group D.

3. All the operations relating to the unsealed exposure sources are divided into three classes according to the radionuclide radiation hazard group and an activity existing in workplace (Table 4).

Table 4. Classes of operation with unsealed exposure source

Operation category	Total activity in workplace per Group A activity, Bq
Class I	more than 10^8
Class II	form 10^5 to 10^8
Class III	from 10^3 to 10^5

In case of radionuclides of different radiation hazard groups in workplace, their activity is brought to the value of radiation hazard Group A by the following formula:

$$C_y = C_A + MVA_A \sum (C_I / MVA_I),$$

where, C_y – is a total activity, brought to the activity of the Group A, Bq;

C_A – total activity of radionuclides from the Group A, Bq;

MVA_A -minimum value of activity of the Group A, Bq;

C_I – activity of separate radionuclides, not belonging to the Group A;

MVA_I - minimum value of activity of separate radionuclide, Bq.

4. Requirement for layout of facilities and equipment designed for the operation with unsealed exposure sources are determined based on operation category. In case of simple operations with liquids (without evaporation, distillation, barbotage etc.) tenfold increase in activity in workplace is allowed. 20-fold increase in activity in workplace is allowed in case of simple operations relating to elution from the generators and packing of medical-purpose

short half-life radionuclides. Determination of operation category is made based on maximum activity of simultaneously eluated daughter radionuclides. For the processing plants of uranium and its compounds operation category is determined according to production type and is established based on the relevant statutory act. 100-fold increase in activity is allowed for the storage of unsealed exposure source.

5. In case of simultaneous usage of more than one radionuclide, relation between activity of separate nuclides and maximum activity shall not exceed 1.

6. Taking into consideration of operation nature, radionuclide radiotoxicity, type, amount and activity, the regulatory body is entitled to modify operation category.

7. Radiation safety requirements for working with ionizing radiation non-sealed sources are established taking into account of activity of radionuclide and its radiotoxicity. Operation categories are determined based thereon (Table 4). Requirements for working with unsealed exposure sources are regulated by relevant statutory act.

8. Unsealed exposure sources are stored in protective containers in such a way that radioactivity intensity on the surface of container, facility, special storage box, shielded box be no higher than 100 mSv/h in case of their warehousing, and 20 mSv/h - at 1m distance. During transportation of sources (within the laboratory or department area) radioactivity intensity at 1m distance from the surface of container shall not be higher than 100 mSv/h, except for the transportation containers designed for (in case of relevant instrument calibration).

9. When working with unsealed exposure sources using of personal protective equipment (lead-containing protecting aprons, coats, gloves, mask, safety glasses) and special equipment (remote-handled instruments – forceps, pincers, containers etc.) is necessary. In case of contamination of air by radioactive substances, respiratory protection equipment shall be used.

10. Clothing, contaminated above permissible level shall be sent to special washhouse and in case of its unavailability, contaminated clothing is subjected to handling as radioactive waste.

11. When working with unsealed source, mouth pipetting of radioactive solution and operation without gloves is prohibited.

12. All the works, causing emission of radioactive substances in atmosphere shall be done in closed sealed facilities (suction-exhaust cabinets with filter).

13. Radioactive waste, generated during activity shall be sorted and handled in accordance with relevant nuclear and radiation safety requirements. They may be temporarily stored on-place in special-designed facility.

14. The project, developed at planning stage of I and II operation category shall be submitted to the regulatory body for approval.

15. The project shall envisage corresponding facing of floor and working surfaces; as well as smoothness and chemical resistance of working surfaces shall be provided and surface shall be crack-free.

16. Internal surfaces of facilities working tables shall be covered by easy-to-wash waterproof materials with weak sorbing ability.

17. For I and II class works, dosing monitoring facility with relevant metering tools shall be arranged where a worker and patients to be dismissed will be tested on radioactive contamination and will take shower and change their clothes if required.

18. Floor covering in department shall cover walls at the height of 10cm from the floor.

19. Communication systems (pipes etc.) shall be placed into insulating and easily decontaminable materials.

20. Facilities shall be provided with autonomous ventilation systems (separate from general ventilation system of building), and exhausting boxes, workplace protection boxes (except for III class workplaces) shall be equipped with separate air outlet ventilation systems having cleaning filters at outlet.

21. Wash stands in facilities shall have contactless control capabilities. Waste-water from the department before discharging into sewerage system shall be collected in special settler, requirements for which are regulated by relevant statutory act.

Article 15. Handling of radioactive waste

1. The licensee shall be responsible for safe handling of radioactive waste generated as a result of its activity within the scope of license up to the moment of transferring of radioactive waste for placement. Exhausted sources may be stored in facility for no more than two years and thereafter it shall be transferred to the disposal site/storage or returned to the manufacturer.

2. The licensee shall be obliged to:

a) Appoint person responsible for handling of radioactive waste, and determine his/her obligations;
b) Evaluate annually compliance with radioactive waste safe handling conditions and dosage limits;
c) Provide registration of radioactive waste and storage of documentation;
d) Submit annually to the regulatory body radioactive waste inventory data and a report with the indication of their type, amount and transferees (to whom and where the waste was transferred);
e) Provide all required physical protection (safety) measures to avoid unauthorized access to radioactive waste.

3. In case of probability of generation of radioactive waste, radiation protection program shall include waste characterization, their annual amount, activity, radionuclide composition, aggregate state, as well as measures for the prevention of nuclear and radiation accidents and waste disposal.

4. According to aggregate state, radioactive waste may be liquid, solid and gaseous:

a) Organic and inorganic solutions, pulp, slime not subjected to further application and features of which exceeds the level of exemption from regulations are considered as liquid radioactive wastes.
b) Exhausted radionuclide sources, materials, equipment, devices, items, biological objects, soil, as well as solidified liquid radioactive waste not subjected to further application and features of which exceeds the level of exemption from regulations are considered as solid radioactive waste. In addition, solid radioactive waste includes waste, when their radionuclide composition is unknown and specific activity exceeds the following values:
100 kBq/kg – for beta-radiation sources;
10 kBq/kg – for alpha radiation sources;
1,0 kBq/kg – for transuranic radionuclides;
c) Gaseous radioactive waste includes radioactive gases and aerosols generated during production processes and which are not subjected to further application and features of which exceeds the level of exemption from regulations

5. Classification of radioactive waste is defined according to the Regulation # 689 as of December 19, 2014 of the Government of Georgia on approval of the ,, Technical Regulations - "development of departmental authorization registry and maintenance rules for sources of ionizing radiation, radioactive waste, and categorization of sources of ionizing radiation".

6. Collection of radioactive waste shall be made directly at the place of their generation separately from other waste taking into account of the following criterion:

a) Class of waste;
b) Aggregate state (solid, liquid, gaseous);
c) Physical and chemical properties;
d) Organic and inorganic nature;
e) Half-life of waste-contained radionuclides (more than 15 days, less than 15 days);
f) Explosive and flammable;
g) Methods used for waste processing

7. Handling of radioactive waste shall be organized in such a way that exposure doses of workers involved in this process is within permissible limits of exposure of workers, and exposure of representative person is no higher than 0,1 mSv in year (100 mSv) and at the same time effective public exposure dose is no higher than 1 mSv in year.

8. During handling of radioactive waste the licensee shall provide fulfillment of conditions relating to the handling of waste, which is the part of radiation protection program. These conditions may be formulated based on the following criterion:

a) Minimization of radioactive waste generation in terms of both, by amount and activity;
b) Handling of waste of different amount and physical and chemical properties and activity containing different radionuclides separately from

half-life waste (possibility of mixing of waste for the purpose of radiation protection is not excluded);

c) Inventory of radioactive waste, its storage and transfer to the radioactive waste burial/depository in accordance with the Georgian legislation;
d) Non-exceedance of established environmental emission limits or limits of exemption from regulations;
e) Detailed and accurate monitoring of emission of radioactive substances in atmospheric air and their discharge into waste water disposal system and storm water sewerage system;
f) Dose constraint for the emission of radioactive substances into atmospheric air/water shall not be higher than 0,1 mSv in a year (100 mSv in a year), and in this case, maximum permissible level for public shall not be 1 mSv/year;
g) Detailed registration and monitoring of radioactive substances released into environment for the purpose of assessment of exposure of representative person and establishment of conformity with determined limits;

9. The licensee shall make emission of radioactive waste generated as a result of its activity only on the basis of relevant agreement with regulatory body. In the notification delivered to the regulatory body the licensee shall define the following:

a) Features and activity of agents to be released, points and method of their release;
b) All the ways of possible public exposure due to released radionuclide;
c) Assessment of representative person doses;
d) Optimization of radiation protection measures;
e) Non-radiologic hazards.

10. Decision of regulatory body on release of radioactive waste into the environment shall be based on assessment of maximum value of expected annual dose of representative person:

a) If such value is less than or equals to 10 mSv in a year, the licensee submits to the regulatory body only notification;
b) If this value is less than or equals to 10 mSv in a year but the source is not considered safe, the regulatory body coordinates activities, indicates maximum value of emission and rules of further monitoring of place;
c) If such value is higher than 10 mSv in a year, the regulatory body defines for the licensee maximum value of emission and requirements for emission places and environmental monitoring (10 mSv in a year is a lower level of radiation protection optimization).

11. Emission of radioactive substances into the environment of radioactive substances from nuclear medicine department (into domestic and sewage collectors) is allowed in accordance with Table 5:

Table 5. Maximum allowable limits of emission of radioactive substances from nuclear medicine department

Radionuclide	One-time emission no more than mgBq.	Emission per month No more than mgBq.
Se -75	20	200
Sr-89	5	50
Tc-99m	100	30000
In-111	100	2000
I-125	1	10
I-131	1	10
Tl-201	100	6000

12. Optimization of emission into the environment shall be made on the basis of establishment of dose constraint where the following shall be considered:

a) Share in dose formation of other practice and other sources including those to be used in future;
b) Potential changing of conditions affecting public exposure;
c) Uncertainty in radiation assessment;
d) Current best practice experience.

Article 16. Requirements for the licensee

1. Procedures relating to the issue of license, denial of license issuance or cancellation of license shall be governed in accordance with the Laws of Georgia On Licenses and Permits and Nuclear and Radiation Safety.

2. Upon acquisition of license the licensee shall be entitled to commence activities provided that it warrants nuclear and radiation safety and physical protection.

3. The licensee shall establish and introduce into the practice the policy of radiation protection and safety against occupational exposure, as well as the licensee shall provide safety of procedures and taking of relevant organizational measures, records management and delivery of relevant information to worker.

4. In case of any exceedance of limits of workers exposure doses the licensee shall be obliged to immediately notify the regulatory body. The licensee shall be obliged to investigate all reasons of failure to establish organizational and technical measures to avoid recurrence of nuclear and radiological accident or incident.

5. The licensee shall be obliged to appoint on the basis of relevant act the person or persons, responsible for radiation safety who have corresponding competency in radiation protection field according to activity types, and define the following obligations for them:

monitoring of inventory of ionizing radiation sources, collection and storage of radioactive waste, control of individual doses of personnel and registration of data, providing of briefing , development and implementation of emergency preparedness plan, implementation of monitoring and quality control programs etc. A person, responsible for radiation safety shall have unlimited access to any workplace where the activities, considered under the license are carried out.

6. When starting employment the worker shall have special skills in nuclear and radiation safety field. The licensee shall be obliged to provide worker with corresponding instructions.

7. Radiation protection program defined in accordance with the Law of Georgia On Nuclear and Radiation Safety shall be developed based on the specific nature of activity. The program shall define conditions and methods of conformity with main principles of radiation safety, taking into consideration of the category of source, possible risk and type of activity.

8. Radiation protection program shall include the following:

a) Liability (responsibility) of workers in the field of provision of radiation safety within their competence;
b) Relevant act on appointment of a person responsible for radiation safety, and issues, relating to the formation of radiation safety group in case of usage of high-risk sources;
c) Development of internal instructions and rules for monitoring of their implementation;
d) Identification of control and observation zones;
e) Monitoring program of individual and working stations of workers;
f) Description of recording system for exposure doses;
g) Delivery of information to workers on received doses;
h) Plan of prevention of nuclear and radiation accidents and rectification of possible consequences;
i) Provision of control of state of health of workers, including health screening;
j) Quality assurance program;
k) Conditions for handling of radioactive waste;
l) Decommissioning plan.

9. Within quality assurance program the licensee shall provide control of ionizing radiation sources, technical parameters of generators and related equipment with approved tools. Results of control shall be submitted to the regulatory body along with annual report.

10. Service life of ionizing radiation generators is defined on the basis of manufacturer's technical documentation and results of long-term stability test.

11. Development of radiation safety quality assurance program is defined in accordance with the requirements of relevant statutory act.

12. Inventory of sources shall be made with the description of radionuclide, its activity, and radiopharmaceutical. Inventory of tools with radionuclide sources included in it

shall be made with the indication of serial number, source activity, tool description and manufacturing date.

13. Inventory of generators of short-lived radionuclides shall be made with the indication of their description, serial number and nominal activity of generated source.

14. Inventory of other ionizing radiation sources (generators) all be made with the indication of their description, serial number and manufacturing date.

15. The licensee shall be obliged to conduct inventory of sources at least annually and submit results to the regulatory body for keeping of authorization registry.

16. The licensee shall be obliged to return spent source back to the supplier or transfer to radioactive waste burial/depository in accordance with the procedures established under Georgian legislation and notify the regulatory body.

17. The licensee shall be obliged to provide storage of radioactive sources in special-designed facility (temporary storage area of facility) where physical protection of sources and fulfillment of other requirements, specified for temporary storage shall be ensured taking into consideration of category and classes of sources.

18. Temporary storage of radioactive sources shall meet the following requirements:

a) Radioactivity intensity on external surface of walls shall not be higher than 1,0mkg/h;
b) Storage (niches, wells, depositories) shall be equipped in such a way that prevent exposure of personnel during placement or taking out of individual source by remaining sources;
c) Doors, radioactive substances containing containers and packages shall be easy-to-open and have legible marking with the indication of radioactive source description and its activity;
d) The person responsible for the inventory and storage of radioactive sources shall have chart of layout of sources within storage area;
e) Glass containers with radioactive liquids shall be placed into the metal or plastic packages.

19. Decommissioning methods of sealed radioactive sources of I-II categories and long-lived unsealed exposure sources and its implementing resources shall be described in radiation protection program, which includes decommission plan as its part. Decommission plan shall include the following: list of radiation protection measures, implementation methods, rules of shut-down and dismantling of device, conduction of preservation and repair works, handling of generated radioactive waste. These works shall be conducted in accordance with pre-determined plan by employees with relevant skills. Detailed requirements for decommission are defined by relevant statutory act.

20. In case of loss or capture of radioactive source, the licensee is obliged to immediately notify the regulatory body and the Ministry of Internal Affairs of Georgia.

Article 17. Requirements for qualification of workers

1. Requirements for worker's qualification and expertise are defined according to hazard of ionizing radiation source and a field of its usage.

2. Programs of retraining and professional development courses relating to the nuclear and radiation safety issues shall be agreed with regulatory body.

3. The program shall provide delivery to a worker of up-to-date information on radiation risks relating to the occupational exposure of a worker, activity-related specific requirements, and review of requirements established in radiation safety field according to the effective legislation.

4. The licensee shall be obliged to provide periodic retraining of a worker regarding nuclear and radiation safety issues at the following intervals:

a) For workers with secondary education - once every 3 years or upon request of the regulatory;

b) For workers with higher education– once every 5 years.

5. The licensee shall be obliged to provide that a qualification of a worker be in conformity with a type of work done and a worker has relevant qualification and expertise certifying document.

Article 18. Requirements for physical protection (safety)

1. Requirements for physical protection (safety) shall be applied to all ionizing radiation sources except for ionizing radiation generating sources.

2. For the purpose of meeting of physical protection (safety) requirements, the licensee shall be obliged to:

a) Provide introduction of physical protection (safety) systems of ionizing radiation sources physical protection (safety);

b) Design and introduce safety systems on the basis of assessment of design hazards, to avoid illegal acts.

3. Design hazard shall be assessed taking into consideration of the following factors:

a) Category, type, radiation type, features of ionizing radiation source and safety risks relating to the application methods;

b) Possible consequences of illegal usage of ionizing radiation source;

c) Information, delivered by the relevant law enforcement authorities.

4. Physical protection shall be provided by administrative and technical measures, and requirements for physical protection are defined according to the relevant statutory act.

Chapter IV. Medical radiation

Article 19. General requirements for medical radiation

1. Medical radiation belongs to planned exposure situation and all requirements of planned exposure situation shall be applied to it.

2. During medical radiation, radiation exposure limiting and management principles are based on information about obtaining therapeutic outcome therapeutic outcome by using possible minimum levels of radiation.

3. Dose limits are not applied during medical radiation but principles of justification of allocated radiological procedures and optimization of patient protection are applied.

4. For the purpose of reduction of exposure levels of all persons involved in medical radiation process, the licensee shall be obliged to follow:

a) Diagnostic reference levels during medical imaging including image guided interventional procedures, taking into account of provision of relevant image quality;
b) Dose constraints for persons providing patient care including persons participating in biomedical trials;
c) Criterion and regulatory principles regarding patients treated using unsealed sources or those carrying implanted sealed sources. These criterion and regulatory principles are established by regulatory body together with the Ministry of Health, Labor and Social Protection of Georgia and are depending on the type of medical radiation.

5. During carrying out of all types of medical radiation related activity the licensee shall be obliged to provide the following:

a) Qualification and special training of workers (personnel) shall be in conformity with particular type of medical radiation and they shall have expertise regarding radiation protection;
b) medical radiation of a patient for the purpose of obtaining diagnostic information and therapeutic outcome shall be carried out only on the basis of physician's order;
c) Justification of medical radiation procedures shall be made on the basis of agreement between treating physician and radiation therapist;
d) Information on the benefit from diagnostic and therapeutic procedure and expected risks shall be delivered to patients and persons providing patients with care, comfortable conditions and participating in biomedical research;
e) Optimization of physical protection and nuclear and radiation safety shall be provided;
f) Clinical dosimetry, quality assurance, commission and decommission shall be carried out by medical physicist with specialized skills in this field, or by means of direct participation of a person with relevant qualification or under his/her supervision;
g) Diagnostic radiological and image guided interventional procedures shall be fulfilled by medical physicist or a person with relevant qualification, the level

of involvement in procedures of which depends on the complexity and risk of radiological procedure.

6. Medical radiology specialist shall be responsible for carrying out of radiological procedure who shall be obliged to provide safety of procedure and protection of patient.

7. For the purpose of radiation protection optimization during medical radiation the licensee shall be obliged to provide usage of relevant dose constraints during radiological procedure for persons, acting as carriers and/or being under medical radiation exposure within biomedical researches.

8. Exposure of persons providing patients dismissed from the hospital after receipt of radionuclides with care voluntarily, beyond their official and professional obligations, or cooperate with them, shell be limited in such a way that throughout patient examination and/or treatment period the dose for persons under the age of 18 years shall be no higher than 1 mSv and for persons over the age of 18 - 5 mSv. These persons shall be informed about possible risks.

9. If there is no strict clinical indication, prescription of radiopharmaceuticals to pregnant and breast-feeding female patients for medical treatment is not recommended. In this case, the procedure shall be planned in such a way to minimize exposure dose of embryo. The patient shall be informed about possible risks.

10. In case of usage of radiopharmaceuticals for diagnostic or medical treatment purposes, breast-feeding mothers have to stop breast-feeding temporarily. Duration of such limitation depends on the type of preparation, its activity, and it is regulated by relevant recommendations delivered to a patient when dismissed from the hospital.

11. The licensee shall provide not to dismiss a patient who obtained therapeutical procedure (in inpatient or outpatient conditions) using sealed (implants) or non-sealed radiation sources until medical physicist or a person with relevant qualification or a person responsible for radiation protection determines that:

a) Activity of radionuclide within patient body is such that a dose which may be affect family members is not higher than 5 mSv in a year, and for other persons, including those under age of 18 years – no higher than 1 mSv in a year;
b) For the purpose of radiation protection of family members and other persons and prevention of radioactive contamination the written safety instructions were delivered to the patient.

12. Postmortem examination and/or burial of patient died after radionuclide therapy or brachytherapy (treatment with sealed implants) shall be allowed only with remaining activity corresponding to the dose of 5 mSv in a year.

13. Burial of died patient shall be allowed only after extraction of implanted sources.

Article 20. Justification and optimization of medical radiation

1. Justification of medical radiation shall be made on the basis of analysis of comparison of expected diagnostic and therapeutical benefit and concurrent radiation damage, benefit and risks of usage of alternative methods.

2. Preventive examination of population (screening) by medical radiation method and scientific research of apparently healthy persons shall be allowed in case of written consent of study person and only on the basis of corresponding order of the Minister of Health, Labor and Social Protection of Georgia provided that annual effective dose for members of public is less than 1 mSv. Study person shall be informed about possible risks related to medical radiation.

3. Preventive examination (screening) of population by medical radiation method shall be considered justified if treatment of identified disease allows prevention of wide spreading of such disease, or survival/ prolongation of life of individual patient.

4. Justification of medical radiation for pregnant and breast-feeding female patients shall be made on the basis of consultations between treating physician and medical radiology specialist and consent of a patient.

5. In each case of medical radiation the licensee shall be obliged to provide optimization of physical protection and nuclear and radiation safety in such a way to comply with the following requirements:

a) Medical radiological devices, equipment and software affecting medical radiation shall be in conformity with requirements defined under Article 13 of these Technical Regulations;
b) Usage of treatment procedures approved by the Ministry of Health, Labor and Social Protection of Georgia, which defines optimum mode of carrying out of such procedures and reference levels of patient exposure that ensures prevention of deterministic effect;
c) Usage of radiopharmaceuticals registered by the Ministry of Health, Labor and Social Protection of Georgia during carrying out of medical procedures with unsealed radioactive sources;
d) Medical radiology specialist shall provide for all patients individual selection of radiopharmaceutical of adequate method and with the ability of provision of maximum localization (concentration) within the organ to be treated;
e) Medical radiology specialist shall be obliged to consider special aspects of medical radiation:

e.a) exposure of under-age patients (usage of alternative methods obtaining information required for treatment);

e.b.) Exposure of persons involved in medical screening and biomedical researches;

e.c.) receipt of relatively higher doses by patients (therapeutic exposure, interventional procedures, computer assisted tomography, and in some cases nuclear medicine;

e.d.) Exposure of embryo in pregnant female patients;

e.e.) exposure of infant of a patient after nuclear medicine procedures.

Article 21. Calibration of medical equipment

1. The licensee shall provide calibration of radioactive source containing equipment and control and measuring instruments according to the program agreed with the regulatory body.

2. Calibration of radio-therapeutic equipment shall be made with corresponding dosimetric representative parameters (according to the type of energy and radiation, in units of absorbed dose or absorbed dose intensity, at specified distance and in specific conditions) and exposure conditions.

3. Calibration of sealed radioactive sources shall be made according to activity, atmospheric air kerma reference level or intensity of dose absorbed in specific environment, at specific distance by determined reference date.

4. Calibration shall be made during commissioning, after preventive maintenance and repair works that may affect significant parameters of radiation safety.

5. If required, results of radio-therapeutic equipment calibration are rechecked by independent expert upon request of the regulatory body.

6. Calibration data of medical sources shall include information about dosimetric laboratory where calibration was conducted.

7. The licensee shall provide keeping of dosimetry of patients by medical physicist or a person with relevant qualification by means of calibrated dosimeters and protocols agreed with the regulatory body. Dosimetry results shall be indicated in relevant document.

8. Dosimetry of patients shall be carried out by typical doses received by the patients during medical radiation procedures.

Article 22. Diagnostic reference levels

1. In nuclear medicine (diagnostic) diagnostic reference levels are used during radiologic imaging, diagnostic and interventional procedures (Annex 5).

2. The licensee shall ensure:

a) assessment of diagnostic reference levels by means of measurements at approved intervals;

a) review to determine whether the optimization of protection and safety for patients is adequate, or whether corrective action is required if, for a given radiological procedure:

b.a.) typical doses or the value of activity exceed relevant diagnostic reference level;

b.b) typical doses or activity fall substantially below the relevant diagnostic reference level and the exposures do not provide useful diagnostic information or do not yield the expected medical benefit to the patient.

3. Diagnostic reference levels are established:

a) During radiography:

a.a) Surface entrance dose (mg);

a.b) product of dose and area (mgxcm^2);

b) During roentgenoscopy:

b.a.) product of dose and area (mgxcm^2);

- time, min.;

c) During computer assisted tomography

c.a) product of dose and length, (mgxcm)

d) During mammography:

d.a) entrance kerma, (mg);

d. b) average dose per lacteal gland (mg).

Article 23. Quality assurance program

1. The licensee shall be obliged to develop, introduce and implement quality assurance program, which is a part of radiation protection program.

2. In case of usage of radiological units, quality assurance program shall consider the following:

a) Inspection of technical parameters of ionizing radiation source (radiological units, imaging systems, software) during and after receipt of dose in accordance with the rules, established under legislation:

a.a) after any maintenance that may affect radiation protection and safety of patient;

a.b) during installation of any new or modified software that may affect radiation protection and safety of patient;

b) Monitoring of physical and clinical factors used in treatment and diagnostic examination of patient;

c) Written registration of results of imaging procedures;

d) Inspection of maintenance conditions of calibration, monitoring and dosimetry equipment;

e) Continuous and independent review of quality assurance program results according to complexity and risks of radiological procedures.

3. The licensee shall be obliged to provide recordkeeping according to radiation safety quality assurance program which is a part of quality assurance program:

a) Data on imaging procedures, retrospective evaluation of doses, radiation scale, duration, name of radiopharmaceuticals, their activity etc.;

ð) Data on periodic inspection results of calibration, physical and clinical parameters.

4. The licensee shall be obliged to store information, specified under clause 3 of this Article during the period defined by the Ministry of Health, Labor and Social Protection of Georgia for medical recordkeeping and immediately transfer to the regulatory body for the purpose of keeping of authorization registry.

5. The licensee shall be obliged to provide together with radiology specialists, radiation therapy technologists and medical physicists or persons with relevant qualification

periodic examination of medical radiation on particular device, which shall include practical usage and critical analysis of justification principles of radiation protection and optimization.

Article 24. Obligations of licensee in case of radiological accident/incident

1. The licensee shall be obliged to immediately investigate and identify the reasons in case of the following radiological accident/incident:

a) Exposure of wrong patient, his/her organ or tissue;
b) Wrong usage of other radiopharmaceutical or radiopharmaceutical with other activity;
c) Carrying out of radiological procedure, which does not allow obtaining of diagnostic information;
d) Exposure of a patient during radiation therapy with the dose, which does not correspond to the dose or dose fraction prescribed by a treating physician;
e) Any inadvertent exposure of the embryo or fetus in the course of performing a radiological procedure;
f) Any failure of medical radiological equipment, software failure or system failure, or accident, error, mishap or other unusual occurrence with the potential for subjecting the patient to a medical exposure that is substantially different from what was intended.

2. In case of nuclear and radiological accident, the licensee shall be obliged to:

a) calculate and evaluate received doses and their distribution within patient body;
b) take corrective measures to avoid recurrence of accident (incident);
c) notify the regulatory body in writing about results of investigation of accident causes;
d) Deliver information to a patient and treating physician about accident.

3. In case of usage of ionizing radiation sources for medical purposes, monitoring of patient exposure doses, recording of doses and record registration is required.

Chapter V. Emergency exposure situation

Article 25. Emergency exposure situation

1. In case of nuclear and radiological accident, it is required to take practical measures in due time to prevent further development of accident, restore control on radiation source and minimize exposure doses of worker and members of public, number of exposed persons, environmental radioactive contamination level and economic and social damages caused by the accident.

2. Requirements for elimination of nuclear and radiological accident and/or minimization of consequences shall be applied to the person responsible for emergency preparedness and response in case of nuclear and radiological accidents.

3. During emergency response to nuclear and radiological accidents there shall be provided relevant preparedness at facility, local and/or national levels, as well as at international level in accordance with contract concluded between states.

4. Accident management system on-scene (at facility, local, national and international levels) envisages significant elements, such as:

a) Assessment of hazard;
b) Development and implementation of a plan of emergency measures and procedures;
c) Clear distribution of liabilities of persons and organizations having defined functions regarding provision of emergency preparedness and response measures;
d) Coordination and effective cooperation measures of organizations participating in emergency response operations;
e) Reliable communication, including notification of members of public;
f) Optimized protection strategy for the public under possible exposure for the implementation and completion of radiation protection measures, as well as there shall be considered taking of relevant environmental protection measures;
g) Protection measures of workers, participating in emergency response procedures;
h) Radiation protection training of persons participating in emergency response, implementation of emergency measures plans and procedures;
i) Preparation for transition from an emergency exposure situation to an existing exposure situation;
j) Emergency situation action plan for medical and health institutions;
k) Provision of individual dosimetric control and environmental radiation monitoring, assessment of exposure doses.

5. During response to nuclear and radiological accidents the following may be required:

a) Taking of prompt preventive measures to avoid serious deterministic effects to health;
b) Taking of prompt preventive measures to avoid stochastic effects to the extent to which their effective implementation is possible;
c) Taking of relevant measures to avoid oral penetration of radionuclides into human body, and taking long-term preventive actions in agricultural field;
d) Provision of protection of workers participating in emergency response procedures.

6. When detecting nuclear and radiological accident, including radioactive contamination, exposure limiting shall be made by means of protective measures for the environment and/or public. These measures may negatively affect public health and environmental state and thus the following principles shall be followed during making of decision about intervention (protective measures):

a) Intervention shall yield more benefit than damage to public, including exposed persons. It means that minimization of damage as a result of exposure dose reduction has to be sufficient for the justification of damage due to intervention, taking into consideration of social and economic conditions (intervention justification principle);
b) Intervention form, scope and duration shall be optimized in such a way that provides maximum benefit from the reduction of radiological damage (except for intervention-related damage) (intervention optimization principle).

7. Radiation practice, as well as handling of radioactive waste shall be divided into categories like nuclear and ionizing radiation-related hazards. Emergency response planning depends on the type of practice, grouped as five categories of hazard and reflects general peculiarities regarding scope of hazard and during occurrence of hazard (Table 6). General criterion are established for the purpose of carrying out of prompt and preventive actions, as well as for other measures of response to hazard.

8. High radiation risk facility is a facility activities of which belong to the activities of I and II Categories, defined according to hazard categories (Table 6).

Table 6. Hazard categories

Hazard category	Hazard description
I	Activity, including nuclear power plant operation, during carrying out of which events developed at working area may cause (or caused previously) occurrence of serious deterministic effect out of working area
II	Activity, including operation of research atomic reactor, during carrying out of which events developed at working area may cause (or caused previously) exposure of persons with doses that requires taking of prompt protective measures
III	Activity, including operation of production irradiation devices, during carrying out of which events developed at working area may cause (or caused previously) radioactive contamination of persons out of working area or their exposure with doses that requires taking of prompt protective measures within working area
IV	Activity, including unauthorized activity with usage of dangerous, illegal sources; transportation related to the dangerous mobile sources (production radiographs, radio-thermal generators), which may generate nuclear or radiological emergency situation and which requires taking of prompt protective measures
V	Activity not related to ionizing radiation sources but generates products, which may be contaminated from the device of I and II category of hazard of neighboring countries, and

	requires prompt setting of limitations on products in accordance with international standards

9. Protective zones boundaries around high radiation risk facilities, boundaries of which are agreed with the regulatory body.

10. Boundaries of protective zones shall be defined taking into consideration of radiation levels generated from such objects, amount and area of radioactive substances released/discharged in environment.

11. It is prohibited within the protective zone to carrying out activities and place object not related directly to the operation of facility.

12. During planning and implementation of protective and other response measures, the following expected consequences shall be taken into account:

a) Development of serious deterministic effects;
b) Growth of stochastic effect risks;
c) Adverse effect on the environment and property;
d) Other negative effect (e.g. negative effects of psychological nature, social unrest, economic destabilization).

13. During planning and implementation of protective and other response measures, the following exposure parameters shall be considered:

a) Projected dose, which may be avoided or reduced by undertaking preventive prompt protective measures;
b) Received dose, the damage caused by which may be minimized by undertaking required medical actions or provision of public with consultations and information.

14. Preventive prompt protective measures shall be taken before occurrence of event (based on the risk of significant release in environment or exposure), to avoid development of gross deterministic effects in sufficiently high doze conditions (General criterion is referred to in Table 1 of Annex 6 of these Technical Regulations).

15. For the purpose of risk minimization in case of risk of stochastic effects, when deterministic effects are insignificant it is required to take prompt and preliminary protective measures based on justification and optimization principles (General criterion is referred to in Table 2, Annex 6 of these Technical Regulations).

16. In case of exceedance of general criterion dozes indicated in Tables 1 and 2, Annex 6 of these Technical Regulations, there shall be provided relevant individual medical service, including treatment, long-term health monitoring and consultations of psychologists for exposed persons.

17. Information on all levels of doses generated in emergency exposure situation shall be immediately delivered to the persons, responsible for decision making, which shall be the basis for further activities.

18. Established general criterion (levels) represents reference levels.

19. When radiation level eliminated by protective measures does not exceed response criterion, it is not required to take measures causing disturbance of normal pace of life of public, as well as agricultural and social mode of life at the territory.

20. When within defined period possible radiation absorbed dose exceeds established response criterion, due to which clinical manifestation of deterministic effects may take place, prompt intervention is required (protective measures).

21. In case of exceedance of established level of exposure dose, the following have to be carried out for exposed persons:

a) Emergency medical examination, consultation and treatment;
b) Radioactive contamination monitoring;
c) Registration for the purpose of long-term monitoring of their health;
d) Psychological aid.

22. Based on the fact that direct measurement of projected and received dose is not possible, they shall not be used as a basis for prompt actions in emergency situations. In such cases predetermined effective criterion shall be applied.

23. During intervention activities, exposure dose limits shall not be applied. The regulatory body shall establish effective response criterion (effective and equivalent radiation doses) corresponding to particular radiation object, taking into consideration of conditions of its placement, accident type, development of emergency situation scenario and existing exposure situation.

24. Effective criterion represents parameters of measured values or characteristics, which include operational intervention levels, observable signs and indicators of on-scene condition.

25. At the stage of elimination of nuclear and radiological accident that caused widespread radioactive contamination by long-lived radionuclides, decision on carrying out of protective activities shall be made based on exposure conditions and specific social and economic factors. In this case, justification of intervention shall be made by amount of effective dose (by equivalent dose of thyroid gland, embryo irradiation), which may be avoided as a result of taking of defined protective measures (avoided dose).

Article 26. Occupational exposure in emergency exposure situation

1. Emergency plan shall define data and qualification of employees, who may be exposed first as a result of accident.

2. Conditions of emergency medical aid, hospitalization of exposed persons and if required, their decontamination shall be defined for emergency situation.

3. Exposure of emergency worker with the dose higher than maximum allowable 50mSv shall be prohibited except for the following cases:

a) Saving life or preventing serious injury;
b) Undertaking actions to prevent severe deterministic effects and actions to prevent the development of catastrophic conditions that could significantly affect people and the environment;

c) Undertaking actions to avert a large collective dose

4. In the exceptional circumstances, response organizations shall make all reasonable efforts to keep doses to emergency workers below the values set out in Annex 6, Table 3.

5. Emergency works, which may cause approach or exceedance of values set out in Annex 6, Table 3 shall be done only when the expected benefits to others would clearly outweigh the risks to the emergency workers.

6. Increased exposure of males above the age of 30 years shall be allowed only once in their lifetime, in case of advance notification about committed doses and health risks and based on their consent.

7. Exposure of emergency workers involved in elimination of consequences of nuclear and radiological accident shall not be more than tenfold increase in average annual value of basic radiation doses.

8. Workers, receiving exposure dose in emergency exposure situation shall continue their professional activity. When a worker receives more than 200 mSv dose, he/she shall be subjected to medical examination. These persons may continue working with ionizing radiation sources on the basis of their consent and qualified medical conclusion.

9. Persons other than workers (personnel) who are invited for the conduction of emergency works shall be registered and admitted to works as workers (personnel).

Article 27. Public exposure in emergency exposure situation

1. For the purpose of protection of members of public in emergency exposure situation the regulatory body shall define intervention levels taking into consideration of the type of accident, development of emergency situation and existing radiation state (Annex 6, Table 1, 2).

2. When public annual exposure dose limits exceed established values, it shall be required to undertake protective measures during whole lifetime in accordance with Annex 6 Table 4.

3. For the purpose of implementation of foodstuff limitation actions, operational intervention levels shall be used which are based on general response criterion and defined according to the scope of emergency situation (Annex 6, Table 5). In case of exceedance of values of operational intervention levels, set out in Annex 6, Table 5, further assessment of foodstuff shall be made in accordance with Table 6 of the same Annex, and values of operational intervention levels.

4. If during a year monthly effective dose to be incurred by member of the public exceeds 10 mSv or effective dose throughout the entire lifetime may exceed 1000 mSv (20 mSv in a year unequally), the authorized body shall make decision about population relocation without examination of conditions regarding return to permanent place of residence. Doses referred to in this clause do not include dose contribution from foodstuff and drinking water.

5. In case of accident, causing radioactive contamination of significant area of territory, the authorized body on the basis of radiation state management and predictions

shall define radiation accident zone. Radiation state monitoring and activities designed for the reduction of public exposure level shall be carried out within radiation accident zone.

Article 28. Requirements for the licensee regarding preparedness and response to radiation emergency situations

1. The licensee shall provide implementation of emergency plan at the facility. Implementation of emergency actions and cross-border emergency plan out of the facility shall be made by authorized bodies, defined under Georgian legislation.

2. All the facilities, where probability of radiation accident and thus unexpected exposure of personnel and/or the public exists, shall develop accident prevention and accident consequences management plan. This plan represents the part of radiation protection program.

3. Accident prevention and accident consequences management plan shall include activities related to early notification after carrying out of which the personnel shall promptly implement accident elimination measures considered under the plan.

4. The licensee shall provide radiation protection of workers, involved in nuclear and radiological accident elimination works.

5. In case of nuclear and radiological accident, the accident prevention and accident consequences management plan shall include the following:

a) Prediction of potential accident, their causes, types, possible development scenario, as well as prediction of different types of radiation situation of an accident;
b) Evaluation of accident size (scope), description of methods of assessment of consequences, and of required equipment;
c) Criterion for making of decision on undertaking of protective measures;
d) List of authorized bodies to be informed at early notification stage. The plan shall also include description of the system of communication with these bodies;
e) Organization of radiation management;
f) Description of qualification of workers participating in implementation of the plan;
g) Rule of due time information of public;
h) Rules of conduct of workers in case of accident;
i) Liabilities of facility authorized persons during carrying out of emergency works;
j) Public and environment protection measures;
k) Protection measures of workers involved in emergency works.

6. Accident prevention and accident consequences management plan shall be revised and updated periodically according to the facility activity risks.

7. The licensee shall notify the regulatory body about all cases of emergency situation or incident, requiring intervention. Notification shall include information about current

situation and its development: measures undertook for the purpose of protection of public and workers, their exposure doses, list of activities required for the mitigation of harmful effect to the environment. After elimination of accident, final report shall be submitted to the regulatory body in accordance with approved plan.

Chapter VI. Existing exposure situation

Article 29. Existing exposure situation

1. Existing exposure situations include situations of exposure to natural background radiation, as well as situations of exposure due to residual radioactive material that derives from past practices that were not subject to regulatory control or that remains after an emergency exposure situation.

2. Assignment of existing exposure situation status to emergency exposure situation shall be made by decision of the regulatory body.

3. Requirements for public exposure limitation shall be applied to all types of existing exposure:

a) Exposure due to contamination of the territory by radioactive materials arising from past activities not subjected to regulatory control:

a.a) exposure beyond regulatory control or which was regulated by other standards;

a.b) exposure due to nuclear or radiological emergency situation, after an emergency exposure situation has been declared ended

b) Exposure arising from residual radioactive materials after decontamination and/or natural consumer products containing radionuclides, including: food, feed grain, drinking water, construction materials, as well as natural exposure existing in the environment;

a) Exposure in workplaces associated to natural sources, including 222Rn and 220Rn and their progeny. This sub-clause shall not be applied to the exposure due to radionuclides of uranium or thorium decay chains, which is controlled by the requirements for planned exposure situations, for dwellings and other buildings with high occupancy factors for members of the public;

b) Exposure due to radioactive materials, except for the cases, when specific activity of radionuclides in uranium or thorium decay chains ს specific activity does not exceed 1 Bq/g or ^{40}K specific activity does not exceed 10 Bq/g, as well as to the exposure defined in Article 6, clause 1 of these technical regulations;

c) Exposure of aircrew and space crew to cosmic radiation.

4. Provision of radiation protection and safety of the public in existing exposure situation shall be made in accordance with the legislation.

5. To provide radiation protection of the public in existing exposure situation, exposure risks associated with existing situation shall be considered.

6. Remedial and protective actions after elimination of radiological accident shall be carried out taking into consideration of justification and optimization principle. During carrying out of actions considered under optimization principle, priority shall be given to the persons whose exposure dose exceeds reference levels.

7. The following shall be considered during making of decision upon completion of remediation and protective actions after elimination of radiological accident:

a) Actions to be carried out taking into consideration of remaining radiation risks, their scopes and period of their implementation;

b) Determination of authorized person or a body, which shall control existing situation after completion of remediation measures;

c) If required, restrictions established for the purpose of control of territory restored after accident, including:

c.a) restriction of access to the territory of unauthorized persons;

b.a) Removal of radioactive material or use of such material, including its use in commodities;

c.a) Future use of the area, including the use of water resources and use for the production of food or feed, and the consumption of food from the area;

d) Requirement for review of existing situation at remediated area and relevant changes to established restrictions (at remediated area conditions shall be reviewed periodically and, if appropriate, any restrictions shall be amended or removed).

8. Environmental radiation monitoring and assessment of public exposure doses shall be made at the areas contaminated by long-lived radionuclides.

9. The regulatory body under agreement with the Ministry of Health, Labor and Social Protection of Georgia shall establish exposure reference levels, arising from radionuclides contained in consumer products and goods, including construction materials, food and drinking water (Annex 7) and animal food. These reference levels hall be defined in such a way that annual effective dose for representative person shall not be higher than 1 mSv in a year.

10. Activity concentration (specific activity) of Cs-134 and Cs-137 in agricultural products intended for export shall correspond to the following conditions:

a) not exceeding 370 Bq/kg in milk and milk products for infants (up to 6 months) ;

b) not exceeding 600 Bq/kg in any other products.

11. For food products intended for international trade, which could contain radioactive substances as a result of radiation emergency, international recommendations effective in this field shall be considered during establishment of reference levels.

12. When defining reference levels for radionuclide content in drinking water, recommendation of World Health Organization shall be considered.

13. If effective dose of radiation in drinking water caused by radionuclides of natural and artificial origin is less than 0,1 mSv in a year, no protective measures are required for the purpose of reduction of radioactivity.

14. In case of consumption of 2l drinking water during day, average values of specific activities of radionuclides have to be lower than reference levels set out in Annex 7 to avoid exceedance of dose limits in existing exposure situation for public.

15. In case of several radionuclides in drinking water, the following condition shall be followed:

$$\sum_i \frac{A_i}{\text{რლ}_i} \leq 1$$

Where, A_i – is a specific activity of i-radionuclide in water, რლi –relevant reference level. If this condition is not fulfilled, it is required to undertake protective measures considering optimization principle. Pre-evaluation of usage of water as drinking shall be made by alpha (A_α) and beta (A_β) aggregate specific activities, values of which shall not exceed 0,5 and 1,0 Bq/kg respectively. If this condition is breached and occurrence of ^{3}H, ^{14}C, ^{131}I, ^{210}Pb, ^{224}Ra , ^{226}Ra, ^{234}U, ^{238}U and ^{232}Th is probable, it is required to define their activity concentration (specific activities). Activity concentration (specific activity) of ^{222}Rn shall not exceed 60Bq/kg.

16. For natural mineral waters, including bottled waters, requirements defined for drinking water in clauses 13 and 14 of this Article shall be fulfilled.

Article 30. Public exposure in existing exposure situation

1. Mitigation of public exposure due to natural sources shall be achieved by limitation of exposure from separate natural sources, namely by establishment of dose limits and reference levels.

2. Taking into account the fact that radon plays significant role in public exposure from natural sources and thorium effect and its contribution is insignificant, public exposure due to radon shall be subjected to control.

3. Protection of members of public in new, under construction and existing dwelling and public buildings shall be provided by defining of reference level of ^{222}Rn (radon), taking into consideration of social and economic factors.

4. During designing of new administrative, public and dwelling buildings it shall be considered that average annual volumetric activity of radon and its progeny inside buildings (in air) shall not be higher than 100 Bq/m^3, which is calculated by the formula: A_{Rn} +4,6A_{220Rn}, and radioactivity intensity of gamma-radiation shall not be higher than 0,2 mSv/hr.

5. Average annual volumetric activity of radon and its progeny inside buildings (in air) for buildings in use shall not exceed 200 Bq/m^3 , which is calculated by the following

formula: A_{Rn} +4,6A_{220Rn}. If average annual volumetric activity of radon and its progeny exceeds 200 Bq/m^3, it is required to undertake protective measures for the reduction of concentration of radon and its progeny in building air and for improvement of their ventilation. Protective measures shall be taken also when effective radioactivity intensity of gamma-radiation inside the building exceeds 0,2 mSv/hr.

6. During application of measures for reduction of volumetric activity of radon (^{222}Rn), the following priority issues:

a) Adjustment of activity level of radon (^{222}Rn) to the value, in case of which protection considered optimized;

b) Establishment of zones with increased concentration of radon (^{222}Rn);

c) Determination of building features, causing increase in volumetric activity of radon (^{222}Rn);

d) Defining preventive measures for radon (^{222}Rn) in buildings under construction.

7. For natural origin construction materials from mineral deposits (broken stone, gravel, quarry and pylon rock, raw materials of cement and bricks etc.), secondary products generated as a result of production or production residue, used for the production of construction materials (ash, slag etc.), effective specific activity (A_{ef}) of natural radionuclides Shall not exceed:

a) For the materials, used for buildings to be newly constructed or buildings subjected to reconstruction and intended for dwelling and public usage (I კლასი):

$$A_{ef} = A_{Ra}+1,3A_{Th}+0,09A_K \leq 370 \text{ Bq/kg},$$

where, A_{Ra} and A_{Th} is specific activities of radium-226 and thorium-232 being in equivalent state with other members of uranium and thorium series, and A_K - specific activity of potassium -40-ის (Bq/kg);

b) For road constructions within populated areas and prospective development zones, as well as for plant production (II class):

$$A_{ef} \leq 740 \text{ Bq/kg}$$

c) For the materials used for road constructions out of populated areas (III class):

$$A_{ef} \leq 1500 \text{ Bq/kg}$$

d) When for construction material 1500 Bq/kg < A_{ef} ≤ 4000 Bq/kg (IV class), the decision on usage of such material is made in each specific case on the basis of agreement

with the regulatory body. When A_{ef} > 4000 Bq/kg, material shall not be used for construction.

8. In mineral fertilizers and agricultural chemical agents maximum permissible level of potassium-40 shall not be defined. Requirements, set out in clause 7 of this Article of Technical Regulations shall not be applied to handling of materials containing potassium-40.

9. During handling of materials containing potassium -40, requirements set out in clause 2, Article 27 for the limitation of public exposure shall be fulfilled.

10. Consumer products with high reference levels shall have label indicating radionuclides in its composition and their activity.

11. Manufacturer of consumer products with high reference levels shall provide processing and utilization of these products in accordance with the requirements of the regulatory body.

12. Laboratories with relevant accreditation, conducting analysis for the determination of radionuclide content in food and drinking water samples shall use methods, agreed with the regulatory body.

Article 31. Occupational exposure in existing exposure situation

1. Requirements for radiation safety of workers and members of public during exposure to natural radiation sources in production conditions shall be defined:

a) when a worker, or members of public are under harmful exposure of radon or thorium decay products;
b) for works associated with non-radioactive substances containing natural radionuclides, which may cause increased exposure of worker, and in some cases increase in public exposure;
c) for works associated with non-radioactive waste, containing natural radionuclides which may cause increase in exposure of workers and in some cases members of public as well;
d) during operation of aircrafts.

2. In case of mining operations (working with natural sources), which are not removed from regulation, the following requirements have to be considered for the purpose of provision of safety:

a) Carrying out of radiation monitoring;
b) Use of protecting equipment, limiting exposure.

3. When exposure of aircrew members exceeds 5 mSv of annual effective dose, decision on dose monitoring is made by the regulatory body. In this case exposure doses shall be assessed and security shall be provided by means of optimization.

4. Exposure in workplace due to ^{222}Rn and 220Rn, including their decay products, where average annual specific activity in air exceeds reference level, is regulated in Article 23 of these Technical regulations.

Article 32. General requirements for monitoring. Individual and workplace monitoring

1. The licensee of nuclear and radiological activity shall, independently or together with other licensed organization carry out monitoring of individual doses and workplaces of workers. On the basis of obtained results, the licensee shall conduct evaluation of occupational exposure of workers and prediction of results.

2. Monitoring includes the following:

a) Individual monitoring, i.e. determination of annual effective doses for all employees working within control zone and their recording taking into account of potential exposure risks;
b) Periodic monitoring of workplaces within control and survey zone.

3. Contribution of exposure due to natural sources in production conditions regarding exposure dose of a worker shall be controlled if a dose received from natural sources exceeds 1 mSv in year.

4. Type and periodicity of monitoring of workplaces shall be defined in such a way to be considered sufficient for:

a) the evaluation of exposure state at all workplaces;
b) the evaluation of exposure within control and survey zone;
c) the analysis of conditions of borders of control and survey zones.

5. Monitoring shall be based on the following indicators: radioactivity intensity, concentration of radionuclides in air, surface contamination by radionuclides, as well as expected modification and probability of value of exposure doses in ordinary and emergency situations.

6. The licensee shall be obliged to control release of radioactive waste generated during activities (radionuclides emitted in atmosphere and discharged into water outlet) into environment and not exceed basic dose limits.

7. Within the monitoring program the licensee shall:

a) appoint person responsible for recording of monitoring results, evaluation of doses, delivery of information to workers about received doses, and for filling-in of cards for registration of individual doses of workers;
b) record monitoring results;
c) notify the regulatory body in case of exceedance of maximum levels of monitoring results and of maximum permissible levels of emission and discharge into environment;
d) provide periodic calibration of dosimetric tools required for monitoring.

8. Occupational exposure doses may be evaluated according to monitoring results, based on individual monitoring of workers involved in chronometry operations and similar activities.

9. Evaluation of occupational doses of employees working within survey zone shall be made on the basis of workplace monitoring results, taking into account of potential exposure risks where there is a probability of receipt of more than 6 mSv dose in year.

10. Individual monitoring includes monitoring of external and internal exposure.

11. Monitoring of external exposure of a worker shall be made by means of measurement of individual equivalent dose of a worker by individual dosimeters. On the basis of measurement results, effective dose of external exposure, equivalent dose of external exposure of skin and crystalline lens are evaluated.

12. During application of specific methods of work (in medical activity or other works) or in case of introduction of new methods for examination, when overexposure of extremities and crystalline lens is expected, monitoring of equivalent dose of exposure of extremities and crystalline lens is carried out.

13. Internal exposure monitoring shall be carried out when the amount of radionuclides within the body of a worker exceeds or may exceed 1/10 (0,1) of annual limit on intake. Annual limits on intake are represented in Annex 2. When unknown radionuclides get into human body, annual limit on intake shall be calculated for radionuclide with redundant radiotoxicity.

14. Detailed requirements for individual monitoring control shall be specified on the basis of Resolution of the Government of Georgia.

15. For the purpose of limitation of exposure of workers due to radioactive contamination, permissible levels are established for the workplaces, human skin, special clothes, personal protective equipment (Table 7) and vehicle surfaces (Table 8).

Table 7. Permissible levels of radioactive contamination on surfaces of workplaces, human skin, special clothes and personal protective equipment (part./cm^{2}xmin)

Contaminated object	Alpha-active nuclides		Beta-active nuclides
	separate[2]	other	nuclides
Intact skin, special underwear, towels, internal surface of personal protective equipment	2	2	200[3]
Basic special clothes, internal surface of additional personal protective equipment, external surface of special shoes	5	20	2000
Surface of permanent working facilities of worker, and of equipment located in it	5	20	2000
Surface of temporary working facilities of worker, and of equipment located in it	50	200	10000
External surface of disposable personal protective means	50	200	10000

Note: 1. For the surfaces of working facilities and equipment, contamination with alpha-active radionuclides shall be regulated by non-fixed contamination. For other surfaces – by total contamination (fixed and non-fixed).

2. This group includes alpha-active radionuclides average annual volumetric activity of which in room air shall be less than 0.3 Bq/∂^{3}

3. The following levels of contamination of human intact skin, special cloths, towels, internal surface of personal protective equipment due to different radionuclides are specified:

$$- -^{90}Sr + -^{90}Y- 40 \text{ part./cm}^2\text{xmin.}$$

Table 8. Permissible levels of radioactive contamination of vehicle surfaces

Contaminated object	Permissible levels of radioactive contamination, part./(cm^2*min.)			
	Non-fixed contamination		Fixed contamination	
	Alpha-active radionuclides	Beta-active radionuclides	Alpha-active radionuclides	Beta-active radionuclides
External surface of container package	prohibited	prohibited	Not regulated	200
External surface of container car	prohibited	prohibited	Not regulated	200
Internal surface of container package	1,0	100	Not regulated	2000
External surface of transport container	1,0	100	Not regulated	2000