



МАЯК  
РОСАТОМ

# LIST OF Tests (Analyses) of Materials and Equipment Performed by Testing Laboratories of Mayak Production Association





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**Table 1: Analytical Laboratory (Central Plant Laboratories), Accreditation Certificate No. RA.RU.510509**

| No. | Description of items to be measured, tested and checked   | Monitored parameters   | Range and accuracy of measurements   | Identifier and title of a document concerning methods of measurements, tests and checks    |
|-----|---|--|--|--|
| 1   | 2   | 3  | 4  | 5  |
| 1   | Natural surface water;<br>treated wastewater;<br>wastewater   | Sulphonol NP-1   | (0.05 to 0.5) mg/dm <sup>3</sup> , ± 42 %, ± 35 %, ± 24.5%   | Instructions<br>I.CZL.MI.052-2016<br>(rus. И.ЦЗЛ.МИ.052-2016)                              |
|     |   | Oil products (total)   | (0.05 to 50.0) mg/dm <sup>3</sup> , ± 40 %, ± 35 %   | Instructions<br>I.CZL.MI.066-2016<br>(rus. И.ЦЗЛ.МИ.066-2016)                              |
|     |   | Phosphate  | (0.05 to 80) mg/dm <sup>3</sup> , ± 16 %, ± 14 %, ± 12 %   | Environmental<br>Requirements<br>PND F 14.1:2:4.112-97<br>(rus. ПНД Ф 14.1:2:4.112-97)     |
|     |   | Chlorides (in terms of Cl <sup>-</sup> )<br>Nitrates (in terms of NO <sub>3</sub> <sup>-</sup> )<br>Sulphates (in terms of SO <sub>4</sub> <sup>2-</sup> ) | (0.1 to 500) mg/dm <sup>3</sup> , ± 15 %, ± 10 %<br>(0.1 to 3,000) mg/dm <sup>3</sup> , ± 15 %<br>(0.2 to 500) mg/dm <sup>3</sup> , ± 10 % | Measurement Method<br>FR.1.31.2005.01724<br>(rus. ФР.1.31.2005.01724)                      |
| 2   | Potable water,<br>domestic potable<br>water from central<br>water supply;<br>water from surface<br>sources of drinking-<br>water supply | Anionic surface-active<br>compounds  | (0.025 to 0.1) mg/dm <sup>3</sup> , ± 35 %   | Environmental<br>Requirements<br>PND F 14.1:2:4.158-2000<br>(rus. ПНД Ф 14.1:2:4.158-2000) |
|     |   | Phenol   | (2.0 to 20) µg/dm <sup>3</sup> , ± 50 %, ± 47 %, ± 25 %  | Environmental<br>Requirements<br>PND F 14.1:2.105-97<br>(rus. ПНД Ф 14.1:2.105-97)         |
| 3   | Natural surface water;<br>treated wastewater  | Hardness   | (0.06 to 13) degrees of hardness,<br>± (0.037 + 0.040X) mmol/dm <sup>3</sup> ,<br>± (-0.05 + 0.073X) mmol/dm <sup>3</sup>                  | Guidance Document<br>RD 52.24.395-2017<br>(rus. РД 52.24.395-2017)                         |

| No. | Description of items to be measured, tested and checked   | Monitored parameters | Range and accuracy of measurements                                | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|---|----------------------|---|---|
| 1   | 2   | 3                    | 4   | 5   |
| 4   | Potable water, water from sources of domestic and drinking-water supply   | Oil products (total) | (0.05 to 50.0) mg/dm <sup>3</sup> , ± 40 %, ± 35 %                | Instructions<br>I.CZL.MI.066-2016<br>(rus. И.ЦЗЛ.МИ.066-2016)                           |
| 5   | Potable water, domestic potable water from central water supply; wastewater, treated wastewater; water from surface sources of drinking-water supply; natural water | Nickel               | (0.015 to 10) mg/dm <sup>3</sup> , ± 16 %, ± 26 %, ± 42 %         | Environmental Requirements<br>PND F 14.1:2:4.135-98<br>(rus. ПНД Ф 14.1:2:4.135-98)     |
|     |   | Iron                 | (0.05 to 50) mg/dm <sup>3</sup> , ± 15 %, ± 24 %                  |   |
|     |   | Chrome               | (0.015 to 50) mg/dm <sup>3</sup> , ± 15 %, ± 20 %, ± 26 %         |   |
|     |   | Copper               | (0.025 to 50) mg/dm <sup>3</sup> , ± 16 %, ± 26 %, ± 42 %         |   |
|     |   | Manganese            | (0.05 to 10) mg/dm <sup>3</sup> , ± 18 %, ± 24 %, ± 32 %          |   |
|     |   | Zink                 | (0.025 to 50) mg/dm <sup>3</sup> , ± 15 %, ± 20 %, ± 24 %, ± 34 % |   |
|     |   | Cadmium              | (0.05 to 10) mg/dm <sup>3</sup> , ± 15 %, ± 24 %, ± 32 %, ± 36 %  |   |
|     |   | Aluminium            | (0.05 to 50) mg/dm <sup>3</sup> , ± 16 %, ± 26 %, ± 42 %          |   |
|     |   | Barium               | (0.01 to 5.0) mg/dm <sup>3</sup> , ± 15 %, ± 20 %, ± 26 %         |   |
|     |   | Boron                | (0.05 to 15) mg/dm <sup>3</sup> , ± 15 %, ± 24 %, ± 34 %          |   |
|     |   | Molybdenum           | (0.02 to 10) mg/dm <sup>3</sup> , ± 15 %, ± 20 %, ± 26 %          |   |
|     |   | Strontium            | (0.005 to 10) mg/dm <sup>3</sup> , ± 15 %, ± 20 %, ± 26 %         |   |

| No. | Description of items to be measured, tested and checked                                    | Monitored parameters                      | Range and accuracy of measurements  | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|--|---|---|---|
| 1   | 2  | 3   | 4   | 5   |
|     |  | Lead                                      | (0.005 to 10) mg/dm <sup>3</sup> , ± 15 %, ± 20 %, ± 26 %                 |   |
| 6   | Natural water  | 2,4-D<br>(2,4-dichlorophenoxyacetic acid) | (2.0 to 10.0) µg/dm <sup>3</sup> ,<br>± (0.8 + 0.062X) µg/dm <sup>3</sup> | Guidance Document<br>RD 52.24.438-2011<br>(rus. ПД 52.24.438-2011)                      |
| 7   | Industrial releases into the atmosphere  | Tetrachloromethane                        | (8 to 800) mg/m <sup>3</sup> , ± 18 %                                     | Instructions<br>I.CZL.MI.152-2017<br>(rus. И.ЦЗЛ.ММ.152-2017)                           |
|     |  | Methylbenzol                              | (5 to 125) mg/m <sup>3</sup> , ± 18 %                                     | Instructions<br>I.CZL.MI.212-2018<br>(rus. И.ЦЗЛ.ММ.212-2018)                           |
|     |  | Dimethylbenzol                            | (5 to 125) mg/m <sup>3</sup> , ± 16 %                                     | Instructions<br>I.CZL.MI.213-2018<br>(rus. И.ЦЗЛ.ММ.213-2018)                           |
|     |  | Hexachlorobutadiene                       | (0.005 to 4.0) mg/m <sup>3</sup> , ± 25 %, ± 15 %                         | Instructions<br>I.CZL.MI.239-2014<br>(rus. И.ЦЗЛ.ММ.239-2014)                           |
|     |  | Chlorine                                  | (0.07 to 1.4) mg/m <sup>3</sup> , ± 19 %                                  | Instructions<br>I.CZL.MI.159-2017<br>(rus. И.ЦЗЛ.ММ.159-2017)                           |
|     |  | Nitrogen oxides (total)                   | (0.1 to 2,000) mg/m <sup>3</sup> , ± 15 %                                 | Instructions<br>I.CZL.MI.105-2016<br>(rus. И.ЦЗЛ.ММ.105-2016)                           |
|     |  | Carbon                                    | (0.01 to 1.0) %, ± 0.003 %, ± 0.005 %, ± 0.008 %, ± 0.012 %               | Federal Standard<br>GOST 12344-2003<br>(rus. ГОСТ 12344-2003)                           |
| 8   | High-alloy steel and corrosion-resistant alloys (heat-resistant and high-temperature ones) | Sulphur                                   | (0.005 to 0.04) %, ± 0.0016 %, ± 0.0024 %, ± 0.004 %                      | Federal Standard<br>GOST 12345-2001<br>(rus. ГОСТ 12345-2001)                           |

| No. | Description of items to be measured, tested and checked                 | Monitored parameters   | Range and accuracy of measurements   | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|---|--|--|---|
| 1   | 2   | 3  | 4  | 5   |
| 9   | Constructional rolled steel alloy                                       | Chromе   | (15.0 to 20.0) %, $\pm 1.5$ %  | Federal Standard<br>GOST 54153-2010<br>(rus. ГОСТ 54153-2010)                           |
|     |   | Nickel   | (6.0 to 12.0) %, $\pm 2.0$ %   |   |
|     |   | Manganese  | (0.3 to 2.0) %, $\pm 3.0$ %  |   |
|     |   | Titanium   | (0.1 to 1.0) %, $\pm 7.2$ %  |   |
|     |   | Silicon  | (0.2 to 0.9) %, $\pm 5.1$ %  |   |
|     |   | Carbon   | (0.1 to 0.6) %, $\pm 0.003$ %, $\pm 0.005$ %, $\pm 0.008$ %  | Federal Standard<br>GOST 12344-2003<br>(rus. ГОСТ 12344-2003)                           |
| 9   | Constructional rolled steel alloy                                       | Sulphur  | (0.005 to 0.04) %, $\pm 0.0016$ %, $\pm 0.0024$ %, $\pm 0.004$ %   | Federal Standard<br>GOST 12345-2001<br>(rus. ГОСТ 12345-2001)                           |
|     |   | Chromе   | (0.35 to 1.75) %, $\pm 0.005$ %, $\pm 0.008$ %, $\pm 0.016$ %, $\pm 0.024$ %, $\pm 0.04$ %, $\pm 0.08$ % | Federal Standard<br>GOST 54153-2010<br>(rus. ГОСТ 54153-2010)                           |
|     |   | Manganese  | (0.20 to 1.85) %, $\pm 0.024$ %, $\pm 0.04$ %, $\pm 0.08$ %  |   |
|     |   | Silicon  | (0.1 to 1.65) %, $\pm 0.020$ %, $\pm 0.03$ %, $\pm 0.06$ %   |   |
| 10  | Natural surface water; treated wastewater; wastewater                   | Anionic surface-active compounds   | (0.05 to 0.5) mg/dm <sup>3</sup> , $\pm 21$ %, $\pm 16$ %  | Instructions<br>I.CZL.MI.052-2016<br>(rus. И.ЦЗЛ. МИ.052-2016)                          |
| 11  | Potable water, water from sources of domestic and drinking-water supply | $\gamma$ -HCH (lindane) – (1,2,4,5/3,6-1,2,3,4,5,6-hexachlorocyclohexane | (0.1 to 3.5) $\mu$ g/dm <sup>3</sup> , $\pm 34$ %  | Instructions<br>I.CZL.MI.307-2016<br>(rus. И.ЦЗЛ.МИ.307-2016)                           |
| 12  | Potable water, water from sources of domestic and drinking-water supply | 4,4'-DDT-4,4'-dichlorodiphenyltrichloroethane (total of isomers)         | (0.1 to 3.5) $\mu$ g/dm <sup>3</sup> , $\pm 39$ %  | Instructions<br>I.CZL.MI.307-2016<br>(rus. И.ЦЗЛ.МИ.307-2016)                           |

| No. | Description of items to be measured, tested and checked          | Monitored parameters          | Range and accuracy of measurements         | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|--|-------------------------------|--|---|
| 1   | 2  | 3                             | 4  | 5   |
| 13  | Potable water and hot water from centralized water-supply system | Chloroform (trichloromethane) | (0.15 to 0.15) mg/dm <sup>3</sup> , ± 22 % | Instructions<br>I.CZL.MI.302-2016<br>(rus. И.ЦЗЛ.ММ.302-2016)                           |



Table 2: Laboratory for Testing Radionuclide Products manufactured at Mayak, Accreditation Certificate No. OIAE.RU.010(IL) (rus. ОИАЭ.РУ.010(ИЛ))

| No. | Description of items to be measured, tested and checked  | Monitored parameters   | Range and accuracy of measurements | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|--|--|------------------------------------|---|
| 1   | 2  | 3  | 4                                  | 5   |
| 14  | 1. Compounds and products with radioactive isotopes (including radionuclide generators) (sealed) (OK code (Russian National Classification of Products): 70 1100, 70 1200);<br>2. Alpha-sources (radionuclide ionizing radiation sources, radionuclide sources of light) (sealed) (OK code (Russian National Classification of Products): 70 1510);<br>3. Neutron sources (radionuclide ionizing radiation sources, radionuclide sources of light) (sealed) (OK code (Russian National Classification of Products): 70 1520);<br>4. Beta-sources (radionuclide ionizing radiation sources, radionuclide sources of light) (sealed) (OK code (Russian National Classification of Products): 70 1520); | Thermostability, strength after temperature effect according to Class 2 to 6               | Leak-tight/untight                 | Federal Standard GOST R 52241-2004 (rus. ГОСТ Р 52241-2004), <i>Radionuclide Ionizing Radiation Sealed Sources. Durability Classes and Test Methods</i>   |
|     |  | Strength after external pressure effect according to Class 2 to 6                          | Leak-tight/untight                 | ISO 2919:1999(E) <i>Radiation Protection. Sealed Radioactive Sources. General Requirements and Classification</i>   |
|     |  | Shock resistance, strength after an impact according to Class 2 to 6                       | Leak-tight/untight                 | ISO 2919:2012(E) <i>Radiation Protection. Sealed Radioactive Sources. General Requirements and Classification</i>   |
|     |  | Vibration strength, strength after sinusoidal vibration according to Strength Class 2 to 4 | Leak-tight/untight                 | Federal Standard GOST 25926-90 (rus. ГОСТ 25926-90) <i>Radionuclide Ionizing Radiation Sealed Sources. Durability Classes and Test Methods. Norms of Degrees of Rigidity Under Climatic and Mechanical Influences</i> |
|     |  | Strength after puncture according to Strength Class 2 to 6                                 | Leak-tight/untight                 |   |
|     |  | Strength after bending according to Strength Class 2 to 7                                  | Leak-tight/untight                 |   |

| No. | Description of items to be measured, tested and checked   | Monitored parameters   | Range and accuracy of measurements  | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|---|--|---|---|
| 1   | 2<br>Products): 70 1600);<br>5. Gamma-sources and bremsstrahlung sources (radionuclide ionizing radiation sources) (sealed) (OK code (Russian National Classification of Products): 70 1700);<br>6. Reference sources (sealed) except: reference solutions (OK code (Russian National Classification of Products): 70 1800 except 70 1850);<br>7. Sealed radionuclide heat sources (OK code (Russian National Classification of Products): 70 1900) | 3<br>Leaktightness (immersion method)<br>Activity of radionuclides<br>Leaktightness (bubble method)<br>Gas bubbles<br>Leaktightness (vacuum box method)<br>Gas bubbles<br>Leaktightness (helium leak detection)<br>Registered helium flow<br>Shock strength, strength after the stroke of a hammer<br>Drop strength (crash strength), strength after free drop<br>Strength after bending caused by the stroke of a hammer<br>Strength after temperature effect | 4<br>Leak-tight/untight<br>(18 to 2,000) Bq<br>Leak-tight/untight<br>Available/Not available<br>Leak-tight/untight<br>Available/Not available<br>Leak-tight/untight<br>(1·10 <sup>-9</sup> to 6·10 <sup>-8</sup> ) Pa·m <sup>3</sup> ·s <sup>-1</sup><br>Leak-tight/untight<br>Leak-tight/untight<br>Leak-tight/untight<br>Leak-tight/untight | 5<br>Federal Standard<br>GOST R 50629-93 (rus.<br>ГОСТ Р 50629-93) <i>Special Form Radioactive Material. General Technical Requirements and Test Methods</i><br><br>Federal Standard<br>GOST R 50629-93 (rus.<br>ГОСТ Р 50629-93) <i>Special Form Radioactive Material. General Technical Requirements and Test Methods.</i><br>Federal Norms and Regulations NP-053-04 (rus.<br>ФНП-053-04) <i>Safety Regulations for Transportation of Radioactive Materials.</i><br>IAEA Safety Standards for Protecting People and the Environment. <i>Regulations for the Safe Transport of Radioactive Material. Specific</i> |

| No. | Description of items to be measured, tested and checked  | Monitored parameters   | Range and accuracy of measurements   | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|--|--|--|---|
| 1   | 2  | 3  | 4  | 5   |
|     |  |  |  | <i>Safety Requirements No. SSR-6.2012</i>   |
|     |  | Leaktightness (testing by submersion in a liquid (immersion method))<br>Activity of radionuclides            | Leak-tight/untight   | Federal Standard<br>GOST R 51919-2002<br>(rus. ГОСТ Р 51919-2002)   |
|     |  | Leaktightness (wipe test)<br>Activity of radionuclides   | (18 to 2,000) Bq<br>Leak-tight/untight<br>(0.1 to 5.0·10 <sup>-4</sup> ) Bq                          | <i>Radionuclide Ionizing Radiation Sealed Sources. Leakage Test Methods.</i>  |
|     |  | Leaktightness (leakage testing using helium and mass-spectrometer (helium method))<br>Registered helium flow | Leak-tight/untight   | ISO 9978:1992 (E) (rus. МСО 9978:1992 (Е))  |
|     |  | Leaktightness (bubble method)<br>Gas bubbles   | (1·10 <sup>-9</sup> to 6·10 <sup>-8</sup> ) Pa·m <sup>3</sup> ·s <sup>-1</sup><br>Leak-tight/untight | <i>Radioactive Protection. Sealed Radioactive Sources. Leakage Test Methods</i>   |
|     |  | Leaktightness (bubble method)<br>Gas bubbles   | Available/Not available<br>Leak-tight/untight  | Federal Standard<br>GOST 16327-88<br>(rus. ГОСТ 16327-88)   |
|     |  | Leaktightness (vacuum box method)<br>Gas bubbles   | Available/Not available<br>Leak-tight/untight  | <i>Transport Packings for Radioactive Materials. General Specifications.</i>  |
|     |  | Retention of protective properties under normal transportation conditions                                    | Available/Not available<br>Retained / Not retained   | Federal Norms and Regulations NP-053-04 (rus. НП-053-04) <i>Safety Regulations for Transportation of Radioactive Materials.</i> |
| 15  | Radiation protection equipment. Vehicles for transportation of radioactive substances (transportation packages) (OK code (Russian National Classification of Products): 69 6840) | Rates of gamma and X-ray doses   | (0 to 1000) µR/s<br>(0 to 2.58·10 <sup>-7</sup> ) A/kg   |   |

| No. | Description of items to be measured, tested and checked | Monitored parameters  | Range and accuracy of measurements  | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|---|---|---|---|
| 1   | 2   | 3   | 4   | 5   |
|     |   | Retention of protective properties under transportation-accident conditions<br>Rates of gamma and X-ray doses   | Retained / Not retained<br><br>(0 to 1000) $\mu\text{R/s}$<br>(0 to $2.58 \cdot 10^{-7}$ ) A/kg | IAEA Safety Standards for Protecting People and the Environment. <i>Regulations for the Safe Transport of Radioactive Material. Specific Safety Requirements</i> No. SSR-6.2012 |
|     |   | Integrity of slinging devices under normal transportation conditions<br>Deformation, cracks and tears   | Retained / Not retained<br><br>Available / Not available  |   |
|     |   | Integrity of slinging devices under transportation-accident conditions<br>Destructions  | Retained / Not retained<br><br>Available / Not available  |   |
|     |   | Ability to stand normal transportation conditions after total exposure to:<br>1) water drip (in the rain);<br>2) compression (stacking, stockpiling);<br>3) dropping (free drop, free-fall impact);<br>4) shock (in terms of penetration) | Able/ unable  |   |
| 16  |   |   |   |   |



Table 3: Testing Laboratory of Occupational Safety and Health Department,  
Accreditation Certificate No. ROSS RU.0001.514796 (rus. POCC RU.0001.514796)

| No. | Description of items to be measured, tested and checked | Monitored parameters   | Range and accuracy of measurements | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|---|--|------------------------------------|---|
| 1   | 2   | 3  | 4                                  | 5   |
| 17  |   | <b>Noise</b>   |                                    |   |
|     |   | Equivalent noise level   | from 22 dB to 139 dB               | Federal Standard<br>GOST R ISO 9612-2016<br>(rus. TOCT P ISO 9612-2016)                 |
|     |   | Equivalent sound level over an 8-hour working day  | from 22 dB to 139 dB               |   |
|     |   | Peak sound level with frequency compensation C   | from 22 dB to 139 dB               |   |
|     |   | Equivalent sound level and maximum sound level for impulse noise                         | from 22 dB to 139 dB               |   |
|     |   | Equivalent levels of sound pressure in 1/3-octave frequency band from 25 Hz to 20,000 Hz | from 22 dB to 139 dB               |   |
|     | Occupational (operating) environment. Physical factors  | <b>Infrasound</b>  |                                    |   |
|     |   | Sound pressure level in octave and 1/3-octave bands                                      | from 20 dB to 146 dB               | Guidance R 2.2.2006-05<br>(rus. P 2.2.2006-05)<br>Addendum 11                           |
|     |   | General level of sound pressure  | from 20 dBLIN to 146 dBLIN         |   |
|     |   | Energy-equivalent level of sound pressure in octave bands                                | from 20 dB to 146 dB               |   |
|     |   | General equivalent level of sound pressure   | from 20 dBLIN to 146 dBLIN         |   |
|     |   | <b>Vibration</b>   |                                    |   |
|     |   | <i>Local vibration</i>   |                                    |   |
|     |   | Level of vibration acceleration, including corrected, equivalent and corrected levels    | from 51 dB to 175 dB               | Federal Standard<br>GOST 31192.1-2004 (rus. TOCT 31192.1-2004),                         |

| No. | Description of items to be measured, tested and checked | Monitored parameters   | Range and accuracy of measurements                   | Identifier and title of a document concerning methods of measurements, tests and checks  |
|-----|---|--|--|--|
| 1   | 2   | 3  | 4  | 5  |
|     |   | Vibration acceleration (root-mean-square value, corrected value, equivalent value)         | from 0.0032 m/s <sup>2</sup> to 560 m/s <sup>2</sup> | Federal Standard GOST 31192.2-2005 (rus. ГОСТ 31192.2-2005), Methodological Instructive Regulations MU 3911-85 (rus. МВ 3911-85)   |
|     |   | <i>General vibration</i>   |  |  |
|     |   | Level of vibration acceleration, including corrected level, equivalent and corrected level | from 51 dB to 175 dB                                 | Federal Standard GOST 31319-2006 (rus. ГОСТ 31319-2006), Federal Standard  |
|     |   | Vibration acceleration (root-mean-square value, corrected value, equivalent value)         | from 0.0032 m/s <sup>2</sup> to 560 m/s <sup>2</sup> | GOST 31191.1-2004 (rus. ГОСТ 31191.1-2004), Federal Standard GOST 31191.2-2005 (rus. ГОСТ 31191.2-2005), Methodological Instructive Regulations MU 3911-85 (rus. МВ 3911-85) |
|     |   | <b>Microclimate</b>  |  |  |
|     |   | Air temperature  | from minus 20°C to plus 90°C                         | Sanitary Regulations and Standards   |
|     |   | Relative air humidity  | from 2 % to 98 %                                     | SanPIN 2.2.4.548-96 (rus. СанПН 2.2.4.548-96),   |
|     |   | Air speed  | from 0.1 m/s to 20 m/s                               | Methodological Instructive Regulations   |
|     |   | Thermal exposure rate (irradiance)   | from 10 W/m <sup>2</sup> to 20,000 W/m <sup>2</sup>  | MUK 4.3.2756-10 (rus. МУК 4.3.2756-10),  |
|     |   | - Environmental heat stress index  | from plus 15°C to plus 60°C                          | Guidance R 2.2.2006-05 (rus. Р 2.2.2006-05)  |

| No. | Description of items to be measured, tested and checked | Monitored parameters  | Range and accuracy of measurements  | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|---|---|---|---|
| 1   | 2   | 3   | 4   | 5   |
|     |   |   |   | Addendum 12   |
|     |   | <b>Illumination environment</b>   |   |   |
|     |   | Illumination (natural, artificial)  | from 1 lux to 50,000 lux  | Federal Standard  |
|     |   | Illumination pulsation factor   | from 1 % to 98 %  | GOST R 24940-2016 (rus.<br>ГОСТ Р 24940-2016),<br>Set of Rules  |
|     |   | Natural illumination factor   | from 0.1 % to 10 %  | SP 52.13330.2011 (rus.<br>СП 52.13330.2011),<br>Methodological Instructive<br>Regulations MU 2.2.4.706-98 (rus. MY 2.2.4.706-98)/<br>Methodological Instructive<br>Regulations MU OT RM 01-98 (rus. MY OT PM 01-98) |
|     |   | Luminosity  | from 10 cd/m <sup>2</sup> to 180,000 cd/m <sup>2</sup>                              | Federal Standard<br>GOST 26824-20 10 (rus.<br>ГОСТ 26824-20 10)   |
|     |   | <b>Air-ion composition of the air</b>   |   |   |
|     |   | Concentration of air ions of positive polarity  | from 1·10 <sup>2</sup> ion/cm <sup>3</sup> to 1·10 <sup>6</sup> ion/cm <sup>3</sup> | Methodological Instructive<br>Regulations   |
|     |   | Concentration of air ions of negative polarity  | from 1·10 <sup>2</sup> ion/cm <sup>3</sup> to 1·10 <sup>6</sup> ion/cm <sup>3</sup> | MUK 4.3.1675-03 (rus.<br>МУК 4.3.1675-03)   |
|     |   | Unipolarity coefficient   | from 0.1 to 10  |   |
|     |   | <b>Nonionizing electromagnetic optical radiation</b>  |   |   |
|     |   | Ultraviolet radiation (UVA range (0.315 to 0.4 μm), UVB (0.28 to 0.315 μm), UVC (0.2 to 0.28 μm)) | from 0.001 W/m <sup>2</sup> to 200 W/m <sup>2</sup>                                 | Sanitary Regulations and<br>Standards<br>SanPIN 2.2.4.3359-16 (rus.<br>СанПИН 2.2.4.3359-16),<br>Recommendations for  |



| No. | Description of items to be measured, tested and checked | Monitored parameters  | Range and accuracy of measurements | Identifier and title of a document concerning methods of measurements, tests and checks              |  |
|-----|---|---|------------------------------------|--|--|
| 1   | 2   | 3   | 4                                  | 5  |  |
|     |   |   |                                    | Interstate Standards RMG 77-2005 (rus. ПМГ 77-2005), Guidance R 50.2.053-2006 (rus. Р 50.2.053-2006) |  |
|     |   | Laser irradiation   |                                    | from 10 <sup>-8</sup> J/cm <sup>2</sup> to 10 <sup>-4</sup> J/cm <sup>2</sup>                        | Federal Standard GOST R 12.1.031-2010 (rus. ГОСТ Р 12.1.031-2010), Sanitary Regulations and Standards SanPIN 5804-91 (rus. СанПиН 5804-91) |
|     |   | Irradiation of eyes and skin  |                                    | from 10 <sup>-6</sup> W/cm <sup>2</sup> to 1 W/cm <sup>2</sup>                                       |  |
|     |   | Nonionizing electromagnetic radiation emitted by PCs and video-display terminals  |                                    |  |  |
|     |   | Electric field intensity<br>– within frequency range from 5 Hz to 2 kHz,<br>– within frequency range from 2 kHz to 400 kHz,<br>– within frequency range from 45 Hz to 55 Hz |                                    | from 8 V/m to 100 V/m<br>from 0.8 V/m to 10 V/m<br>from 7 V/m to 1,999 V/m                           | Sanitary Regulations and Standards SanPIN 2.2.2./2.4.1340-03 (rus. СанПиН 2.2.2./2.4.1340-03)  |
|     |   | Magnetic flux density<br>– within frequency range from 5 Hz to 2 kHz,<br>– within frequency range from 2 kHz to 400 kHz,<br>– within frequency range from 45 Hz to 55 Hz    |                                    | from 80 nT to 1000 nT<br>from 8 nT to 100 nT<br>from 70 nT to 1,999 nT                               |  |
|     |   | Electrostatic field intensity   |                                    | from 0.3 kV/m to 180 kV/m  |  |
|     |   | Electromagnetic radiation of radiofrequency bandwidth from 30.0 kHz to 18.0 GHz   |                                    |  |  |
|     |   | Electric field intensity within frequency range from 0.03 MHz to  |                                    | from 1 V/m to 500 V/m  | Federal Standard GOST 12.1.006-84 (rus.  |

| No. | Description of items to be measured, tested and checked | Monitored parameters  | Range and accuracy of measurements                                    | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|---|---|---|---|
| 1   | 2   | 3   | 4   | 5   |
|     |   | 300 MHz   |   | ГОСТ 12.1.006-84),<br>Sanitary Regulations and Standards  |
|     |   | Magnetic field intensity within frequency range from 0.03 MHz to 50.0 MHz | from 0.1 A/m to 50 A/m  | СанПН 2.2.4.1190-03 (rus.<br>СанПН 2.2.4.1190-03)   |
|     |   | Energy flux density within frequency range from 300 MHz to 18.0 GHz       | from 1 $\mu\text{W}/\text{cm}^2$ to 100,000 $\mu\text{W}/\text{cm}^2$ |   |
|     |   | <b>Power frequency electromagnetic fields (50 Hz)</b>                     |   |   |
|     |   | Electric field intensity  | from 0.01 kV/m to 100 kV/mm   | Methodological Instructive Regulations<br>МУК 4.3.2491-09 (rus.<br>МУК 4.3.2491-09),<br>Federal Standard<br>ГОСТ 12.1.002-84 (rus.<br>ГОСТ 12.1.002-84) |
|     |   | Magnetic field intensity  | from 0.1 A/m to 1,800 A/m   | Methodological Instructive Regulations<br>МУК 4.3.2491-09 (rus.<br>МУК 4.3.2491-09)   |
|     |   | <b>Electrostatic field</b>  |   |   |
|     |   | Electrostatic field intensity   | from 0.3 kV/m to 180 kV/m   | Federal Standard<br>ГОСТ 12.1.045-84 (rus.<br>ГОСТ 12.1.045-84)   |
|     |   | <b>Workflow difficulty</b>  |   |   |
|     |   | Physical activity (dynamic load)  | Class 1 to 3  | Guidance R 2.2.2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 1   |
| 18  | Workflow factors  | Weight of cargo lifted and moved by hand                                  |   | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 2   |

| No. | Description of items to be measured, tested and checked | Monitored parameters                      | Range and accuracy of measurements | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|---|---|------------------------------------|---|
| 1   | 2   | 3   | 4                                  | 5   |
|     |   | Stereotyped working movements             | Class 1 to 3                       | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 3                     |
|     |   | Static load                               |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 4                     |
|     |   | Working posture                           |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 5                     |
|     |   | Bending of body                           |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 6                     |
|     |   | Spatial movements                         |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 7                     |
|     |   | Overall evaluation of workflow difficulty |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 15, paragraph 8                     |
|     |   | <b>Workflow intensity</b>                 |                                    |   |
|     |   | Intellectual load                         |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 16, paragraph 1                     |
|     |   | Sensory load                              |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 16, paragraph 2                     |
|     |   | Emotional load                            |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)<br>Addendum 16, paragraph 3                     |
|     |   | Monotony of loads                         |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)   |

| No. | Description of items to be measured, tested and checked | Monitored parameters                      | Range and accuracy of measurements | Identifier and title of a document concerning methods of measurements, tests and checks |
|-----|---|---|------------------------------------|---|
| 1   | 2   | 3   | 4                                  | 5   |
|     |   |   |                                    | Addendum 16, paragraph 4  |
|     |   | Type of working schedule                  |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)   |
|     |   | Overall evaluation of workflow difficulty |                                    | Addendum 16, paragraph 5  |
|     |   |   |                                    | Guidance R 2006-05 (rus. P 2.2.2006-05)   |
|     |   |   |                                    | Addendum 16, paragraph 6  |

Table 4: Analytical Laboratory, Bld. 235, Accreditation Certificate No. ROSS RU.0001.519043  
(rus. ПОСС RU.0001.519043)

Section 1 Products tested for the purpose of voluntary validation

| No. | Description of items to be tested   | OKP code (Russian National Classification of Products) 005-93 (Customs Commodity Code) | Description of tests and/or characteristics defined (parameters) | Description of regulatory documents containing values of the parameters                             | Description of regulatory documents for testing methods  |
|-----|-------------------------------------|--|--|---|--|
| 1   | 2                                   | 3  | 4  | 5   | 6  |
| 19  | Uranium, its compounds and alloys   | 1)   | Uranium<br><br>Uranium-235                                       | Specifications:<br>TU 95.2862-2004 (rus. ТУ 95.2862-2004)<br>TU 95.780-88 (rus. ТУ 95.780-88)       | Industry-specific standard OST 95 175-2003 (rus. OCT 95 175-2003) <i>Uranium and its compounds. Gravimetric and peroxide precipitation procedure for measuring uranium content</i><br><br>Industry-specific standard OST 95 446-2001 (rus. OCT 95 446-2001) <i>Uranium. Mass-spectrometry study procedure for analyzing an isotopic composition in solid phase</i>   |
|     |                                     |  | Plutonium  | Company Standard STO C.062-2011 (rus. СТО Ц.062-2011)   | Industry-specific instructions OI 001.716-2011 (rus. OI 001.716-2011) <i>Plutonium dioxide. Procedure for measuring Pu mass fraction using coulometric potentiostat (Integrator) PIK-200 (rus. ПИК-200).</i>   |
| 20  | Plutonium, its compounds and alloys | 1)   | Plutonium-238  | Specifications<br>ТУ 95 11-82 (rus. ТУ 95 11-82)<br>Representative requirements<br>ТТ 45.Т.238-2004 | Instructions I.CZL.MI.129-2017 (rus. И.ЦЗЛ.МИ.129-2017) <i>Instructions of the enterprise. Plutonium-238, americium-241. Procedure for measuring thermal power, weight and mass fraction of plutonium-238 and americium-241 in samples of dioxides of radionuclides using radiometer RK-8 (rus. РК-8). The procedure was certified by the Designer, i.e. Central plant Laboratories (Mayak Production Association), Validation Certificate No. 2309-01.00062-2017 issued August 24, 2017</i> |

|   |                             |    |               |   |  |
|---|-----------------------------|----|---------------|---|--|
| 21  | Americium and its compounds | 1) | Americium-241 | Specifications<br>TU 95 938-82 (rus.<br>TV 95 938-82)<br>Representative<br>requirements TT<br>45.T.241-95 | Instructions I.CZL.MI.129-2017 (rus. И.ЦЗЛ.МИ.129-2017)<br>Instructions of the enterprise. Plutonium-238, americium-241. Procedure for measuring thermal power, weight and mass fraction of plutonium-238 and americium-241 in samples of dioxides of radionuclides using radiometer RK-8 (rus. РК-8). The procedure was certified by the Designer, i.e. Central plant Laboratories (Mayak Production Association), Validation Certificate No. 2309-01.00062-2017 issued August 24, 2017 |
| Notes: 1) OKP codes are given in one of the sections of Russian National Classification of Products OK 005-93 approved by Decree No. 301 of State Committee of the Russian Federation for Standardization and Metrology dated December 30, 1993 |                             |    |               |   |  |

## Section 2 Items tested to define compositions of substances and materials

| No. | Description of items          | Parameter to be defined | Range of values defined            | Identifier (title)<br>of documents describing procedures of measurements  |
|-----|-------------------------------|-------------------------|------------------------------------|---|
| 1   | 2                             | 3                       | 4                                  | 5   |
| 22  | Nitric-acid process solutions | Uranium                 | 0.8 through 350, g/dm <sup>3</sup> | Industry-specific instructions OI 001.693-2010 (rus. ОИ 001.693-2010) Uranium. Titrimetric bichromatic method for measuring mass concentration in process solutions   |
|     |                               |                         | 10 through 400, g/dm <sup>3</sup>  | Industry-specific instructions OI 001.694-2010 (rus. ОИ 001.694-2010) Uranium. Gamma-absorption-metrical method for measuring mass concentration in input process-solutions for spent nuclear fuel reprocessing |
|     |                               | Uranium-235             | 0.20 through 99.99, r.m.f.%, %     | Industry-specific standard OST 95 446-2001 (rus. OCT 95 446-2001) Uranium. Mass-spectrometry study procedure for analyzing an isotopic composition in a solid phase   |

| No. | Description of items               | Parameter to be defined | Range of values defined            | Identifier (title)<br>of documents describing procedures of measurements   |
|-----|------------------------------------|-------------------------|------------------------------------|--|
| 1   | 2                                  | 3                       | 4                                  | 5  |
|     |                                    |                         | 0.5 through 4.0, g/dm <sup>3</sup> | Industry-specific instructions OI 001.692-2010 (rus. OI 001.692-2010) <i>Plutonium. Procedure for measuring mass concentration in process solutions generated in the course of reprocessing spent nuclear fuel</i>   |
|     |                                    | Plutonium               | 0.5 through 4.0, g/dm <sup>3</sup> | Industry-specific instructions OI 001.708-2010 (rus. OI 001.708-2010) <i>Plutonium. Procedure of quantitative chemical analysis of mass concentration in process solutions using their light absorbance spectra and cerium (IV) by means of spectrophotometric unit SKAN-02-04 (rus. CKAH-02-04)</i> |
| 23  | Nitric-acid solutions of neptunium | Neptunium               | 5 through 20, g/dm <sup>3</sup>    | Industry-specific instructions OI 001.709-2010 (rus. OI 001.709-2010) <i>Solutions of 1005 type. Procedure for measuring Ne mass concentration using coulometric unit PIK-200 (rus. ПИК-200).</i>  |
| 24  | Nitric-acid solutions of plutonium | Plutonium               | 1 through 50, g/dm <sup>3</sup>    | Industry-specific instructions OI 001.701-2010 (rus. OI 001.701-2010) <i>Uranium, neptunium, plutonium. Procedure for measuring mass concentration of the main element in intermediate process solutions for spent nuclear fuel reprocessing</i>   |
| 25  | Nitric-acid solutions of uranium   | Uranium                 | 50 through 300, g/dm <sup>3</sup>  | Industry-specific instructions OI 001.695-2010 (rus. OI 001.695-2010) <i>Uranium. Gamma-absorption-metrical method for measuring mass concentration in final process solutions for spent nuclear fuel reprocessing</i>   |

| No. | Description of items | Parameter to be defined | Range of values defined       | Identifier (title) of documents describing procedures of measurements  |
|-----|----------------------|-------------------------|-------------------------------|--|
| 1   | 2                    | 3                       | 4                             | 5  |
|     |                      | Uranium-235             | 0.20 through 99.99, r.m.f., % | Industry-specific standard OST 95 446-2001 (rus. OCT 95 446-2001) <i>Uranium. Mass-spectrometry study procedure for analyzing an isotopic composition in a solid phase</i> |

\*r.m.f. = reference mass fraction



Table 5: Radiation Monitoring Service, Accreditation Certificate No. RA.RU.21MK10

| No. | Description of items to be measured, tested and checked   | Monitored parameters                                     | Range and accuracy of measurements                               | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|---|--|--|---|
| 1   | 2   | 3  | 4  | 5   |
| 26  | Atmosphere: surface air, aerosols, atmospheric fallout  | Total volumetric activity of beta-emitting radionuclides | ( $1 \cdot 10^{-5}$ to $10$ ) Bq/m <sup>3</sup> , (22 to 95) %   | Instructions:<br>I-CZL-376-2016 (rus. И-ЦЗЛ-376-2016),<br>I-CZL-402-2016 (rus. И-ЦЗЛ-402-2016),<br>I.CZL.MI.190-2013 (rus. И.ЦЗЛ.МИ.190-2013),<br>I.CZL.MI.214-2014 (rus. И.ЦЗЛ.МИ.214-2014),<br>I.CZL.MI.231-2014 (rus. И.ЦЗЛ.МИ.231-2014) |
|     |   | Volumetric activity of tritium (in atmospheric moisture) | ( $340$ to $1 \cdot 10^5$ ) Bq/L, (7 to 30) %                    |   |
|     |   | Volumetric activity of gamma-emitting radionuclides      | ( $1 \cdot 10^{-4}$ to $10^2$ ) Bq/m <sup>3</sup> , (11 to 95) % |   |
|     |   | Volumetric activity of alpha-emitting radionuclides      | ( $1 \cdot 10^{-6}$ to $10^2$ ) Bq/m <sup>3</sup> , (20 to 95) % |   |
|     |   | Surface activity of gamma-emitting radionuclides         | (1 to $10^4$ ) Bq/m <sup>2</sup> ·month, (11 to 95) %            |   |
|     |   | Total surface activity of beta-emitting radionuclides    | (0.3 to $10^4$ ) Bq/m <sup>2</sup> ·month, (22 to 95) %          |   |
| 27  | Hydrosphere: surface and ground waters, drains, discharges, ground waters, industrial and process water | Surface activity of alpha-emitting radionuclides         | (0.2 to $10^6$ ) Bq/m <sup>2</sup> ·month, (20 to 95) %          | Instructions:<br>I-CZL-376-2016 (rus. И-ЦЗЛ-376-2016),<br>I-CZL-402-2016 (rus. И-ЦЗЛ-402-2016),<br>I.CZL.MI.190-2013 (rus. И.ЦЗЛ.МИ.190-2013),<br>I.CZL.MI.231-2014 (rus. И.ЦЗЛ.МИ.231-2014)  |
|     |   | Volumetric activity of gamma-emitting radionuclides      | (1 to $1 \cdot 10^5$ ) Bq/L, (11 to 95) %                        |   |
|     |   | Total volumetric activity of beta-emitting radionuclides | (0.02 to $10^4$ ) Bq/L, (22 to 95) %                             |   |
|     |   | Volumetric activity of tritium                           | ( $340$ to $1 \cdot 10^5$ ) Bq/L, (7 to 30) %                    |   |
|     |   | Volumetric activity of alpha-emitting radionuclides      | ( $5 \cdot 10^{-3}$ to $2.3 \cdot 10^6$ ) Bq/L, (20 to 95) %     |   |

| No. | Description of items to be measured, tested and checked  | Monitored parameters                                   | Range and accuracy of measurements |   | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|--|--|------------------------------------|---|---|
|     |  |  | 3                                  | 4   |   |
| 1   | 2  |  |                                    |   | 5   |
| 28  | Lithosphere: soil, bed deposits, vegetation  | Specific activity of gamma-emitting radionuclides      |                                    | (1 to 1·10 <sup>5</sup> ) Bq/kg, (11 to 95) %                             | Instructions:<br>I-CZL.MI.214-2014 (rus.<br>И.ЦЗЛ.МИ.214-2014),<br>I-CZL.MI.376-2016 (rus.<br>И.ЦЗЛ.МИ.376-2016),<br>I-CZL-402-2016 (rus. И-ЦЗЛ-402-2016),  |
|     |  | Total specific activity of beta-emitting radionuclides |                                    | (0.7 to 1·10 <sup>4</sup> ) Bq/kg, (22 to 95) %                           |   |
|     |  | Specific activity of alpha-emitting radionuclides      |                                    | (0.5 to 2.3·10 <sup>6</sup> ) Bq/kg, (20 to 95) %                         |   |
| 29  | Territory of production and buffer areas, territory of surveillance area, territory of residential area, territory of building plots   | Rate of ambient dose equivalent of gamma-radiation     |                                    | (0.1 to 40) μSv/h, (24 to 90) %   | Guidelines<br>MR 2.6.1.27-2003 (rus.<br>MP 2.6.1.27-2003),<br>Methodological<br>Instructive Regulations<br>MU 2.6.5.028-2016<br>(rus. MV 2.6.5.028-2016),<br>Methodological<br>Instructive Regulations<br>MU 2.6.1.1001-00 (rus.<br>MV 2.6.1.1001-00) |
|     |  | Alpha-particle flux density                            |                                    | (1 to 1·10 <sup>5</sup> ) cm <sup>2</sup> ·min <sup>-1</sup> , up to 40 % |   |
|     |  | Beta-particle flux density                             |                                    | (1 to 100,000) cm <sup>2</sup> ·min <sup>-1</sup> , (20 to 50) %          |   |
| 30  | Industrial premises, living quarters and social premises in buildings and constructions: gamma-radiation in rooms and premises, surfaces in rooms and surfaces of indoor equipment, indoor air | Rate of ambient dose equivalent of gamma-radiation     |                                    | (0.1 to 40) μSv/h, (24 to 90) %   | Guidelines<br>MR 2.6.1.27-2003 (rus.<br>MP 2.6.1.27-2003),<br>Methodological<br>Instructive Regulations<br>MU 2.6.5.028-2016<br>(rus. MV 2.6.5.028-2016),<br>Methodological<br>Instructive Regulations  |
|     |  | Alpha-particle flux density                            |                                    | (1 to 1·10 <sup>5</sup> ) cm <sup>2</sup> ·min <sup>-1</sup> , up to 40 % |   |
|     |  | Beta-particle flux density                             |                                    | (1 to 100,000) cm <sup>2</sup> ·min <sup>-1</sup> , (20 to 50) %          |   |
|     |  | Equivalent equilibrium volumetric activity of radon    |                                    | (4 to 5·10 <sup>5</sup> ) Bq/m <sup>3</sup> , 30 %                        | (rus. MV 2.6.5.028-2016),<br>Methodological<br>Instructive Regulations  |

| No. | Description of items to be measured, tested and checked                             | Monitored parameters   | Range and accuracy of measurements                             | Identifier and title of a document concerning methods of measurements, tests and checks   |
|-----|---|--|--|---|
| 1   | 2   | 3  | 4  | 5   |
|     |   |  |  | MU 2.6.1.1001-00 (rus. MY 2.6.1.1001-00)  |
| 31  | Construction and process materials (at all stages of processing, up to end product) | Specific activity of gamma-emitting radionuclides  | (5 to 1·10 <sup>5</sup> ) Bq/kg, (11 to 30) %                  | Instructions<br>I.CZL.MI.214-2014 (rus. И.ЦЗЛ.МИ.214-2014)  |
| 32  | Biological tissues  | Specific activity of gamma-emitting radionuclides  | (1 to 1·10 <sup>5</sup> ) Bq/kg, (11 to 95) %                  | Instructions:<br>I.CZL.MI.214-2014(rus. И.ЦЗЛ.МИ.214-2014),<br>I.CZL-402-2016 (rus. И-ЦЗЛ-402-2016)   |
|     |   | Specific activity of beta-emitting radionuclides   | (0.7 to 1·10 <sup>4</sup> ) Bq/kg, (22 to 95) %                |   |
|     |   | Specific activity of alpha-emitting radionuclides  | (0.5 to 2.3·10 <sup>6</sup> ) Bq/kg, (20 to 95) %              |   |
| 33  | Personnel (routine and emergency monitoring)  | Absorbed (equivalent) dose of photon radiation in soft biological tissue at a depth of 1 g/cm <sup>2</sup> | (0.1 to 10,000) mGy,<br>(0.1 to 10,000) mSv,<br>(15 to 30) %   | Methodological<br>Instructional Regulations:<br>MU 2.6.5.028-2016<br>(rus. MY 2.6.5.028-2016),<br>MU 2.6.5.026-2016<br>(rus. MY 2.6.5.026-2016) |
|     |   | Individual gamma and X-ray dose equivalent   | (50 to 10 <sup>7</sup> ) μSv, 15 %                             |   |
|     |   | Individual neutron dose equivalent   | (50 to 10 <sup>6</sup> ) μSv, (20 to 30) %                     |   |
|     |   | Absorbed dose of neutron radiation   | (0.4 to 64) mSv, (20 to 30) %<br>(0.05 to 50) Gy, (25 to 50) % |   |

| No. | Description of items to be measured, tested and checked   | Monitored parameters   | Range and accuracy of measurements                                 | Identifier and title of a document concerning methods of measurements, tests and checks |   |
|-----|---|--|--|---|---|
|     |   |  |  | 4   | 5 |
| 1   | 2   | 3  |  |   |   |
|     |   | Equivalent dose in skin of fingers and face, and in crystalline lens in case of chronic and accidental exposure of personnel Hp(3), Hp(0,07) | (2 to 10 <sup>5</sup> ) mSv, 40 %                                  |   |   |
| 34  | Objects to be monitored in terms of surface contamination: industrial premises, equipment, final products, packaging, protective garment, personal protective equipment, instruments, transport, motorways, pavements, etc. | Alpha-particle flux density  | (0.1 to 10,000) cm <sup>-2</sup> ·min <sup>-1</sup> , (20 to 50) % | Methodological Instructive Regulations MU 2.6.5.032-2017 (rus. MV 2.6.5.032-2017)       |   |
|     |   | Beta-particle flux density   | (10 to 100,000) cm <sup>-2</sup> ·min <sup>-1</sup> , (20 to 50) % |   |   |
| 35  | Industrial premises: indoor alpha-, beta-, gamma- and neutron radiation   | Rate of ambient dose equivalent of gamma-radiation   | (0.1 to 1,000,000) μSv/h, (15 to 50) %                             | Methodological Instructive Regulations MU 2.6.5.008-2016 (rus. MV 2.6.5.008-2016)       |   |
|     |   | Alpha-particle flux density  | (0.1 to 10,000) cm <sup>-2</sup> ·min <sup>-1</sup> , (20 to 50) % |   |   |
|     |   | Beta-particle flux density   | (10 to 100,000) cm <sup>-2</sup> ·min <sup>-1</sup> , (20 to 50) % |   |   |
|     |   | Rate of ambient dose equivalent of neutrons  | (0.1 – 100,000) μSv/h, (20 to 50) %                                | Methodological Instructive Regulations MU 2.6.5.008-2016 (rus. MV 2.6.5.008-2016)       |   |
| 36  | Territories of production areas and building plots  | Rate of ambient dose equivalent of gamma-radiation   | (0.1 to 1,000,000) μSv /h, (15 to 50) %                            | Set of Rules SP 11-102-97 (rus. ГИ 11-102-97)   |   |

## NOTES

## NOTES

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