

**HEAD OF THE STATE NUCLEAR POWER SAFETY INSPECTORATE**

**ORDER  
ON APPROVAL OF THE NUCLEAR SAFETY REQUIREMENTS  
BSR-3.2.2-2016 'RADIOACTIVE WASTE DISPOSAL FACILITIES'**

30 November 2016 No 22.3-188  
Vilnius

Acting in observance of Article 22(1)(3) of the Republic of Lithuania Law on Nuclear Energy, Article 4(7), Article 11(1) and Article 32(2) and (7) of the Republic of Lithuania Law on Nuclear Safety and Article 7(2)(1),(3) of the Republic of Lithuania Law on the Management of Radioactive Waste:

1. I approve the Nuclear Safety Requirements BSR-3.2.2-2016 'Radioactive Waste Disposal facility' (attached).

2. I repeal:

2.1. Order No 45 of the Head of the State Nuclear Power Safety Inspectorate of 28 October 2002 on approval of the requirements for the disposal of low and intermediate level short-lived radioactive waste;

2.2. Order No 22.3-45 of the Head of the State Nuclear Power Safety Inspectorate of 18 August 2003 on approval of the requirements for the disposal of very low level radioactive waste.

3. I establish that this Order shall enter into force on 1 May 2017.

Head

Michail Demčenko

APPROVED  
by Order No 22.3-188  
of the Head of the State Nuclear  
Power Safety Inspectorate  
of 30 November 2016

**NUCLEAR SAFETY REQUIREMENTS  
BSR-3.2.2-2016**

**RADIOACTIVE WASTE DISPOSAL FACILITIES**

**CHAPTER I  
GENERAL PROVISIONS**

1. The Nuclear Safety Requirements BSR-3.2.2-2016 'Radioactive Waste Disposal Facilities' (hereinafter – the Requirements) set forth the requirements for the selection of an area (site) for construction of radioactive waste disposal facilities, design, construction, commissioning, operation, closure of radioactive waste disposal facilities and carrying out their post-closure surveillance. These Requirements shall not apply to the establishment of criteria for acceptance of low and intermediate level short-lived waste for disposal in a near surface radioactive waste disposal facility and descriptions of requirements for radioactive waste packages when low and intermediate level short-lived waste is emplaced in a near surface radioactive waste disposal facility. Requirements for the establishment of criteria for acceptance of low and intermediate level short-lived waste in a near surface radioactive waste disposal facility and requirements for descriptions of radioactive waste packages of low and intermediate level short-lived waste emplaced in a near surface radioactive waste disposal facility are established in the legal act referred to in subparagraph 2.13.

**CHAPTER II  
REFERENCES**

2. The Requirements contain references to the following legal acts:
- 2.1. Republic of Lithuania Law on Nuclear Safety;
  - 2.2. Republic of Lithuania Law on Nuclear Energy;
  - 2.3. Republic of Lithuania Law on the Management of Radioactive Waste;
  - 2.4. Republic of Lithuania Law on Radiation Protection;
  - 2.5. Republic of Lithuania Law on Environmental Monitoring;
  - 2.6. Regulations on the issue of licences and permits necessary to engage in the nuclear energy activities approved by Resolution No 722 of the Government of the Republic of Lithuania of 20 June 2012 on approval of the regulations on the issue of licences and permits necessary to engage in the Nuclear Energy Activities;
  - 2.7. Nuclear Safety Requirements BSR-1.4.1-2016 'Management System' approved by Order No 22.3-56 of the Head of the State Nuclear Power Safety Inspectorate (hereinafter – VATESI) of 21 June 2010 on approval of the Nuclear Safety Requirements BSR-1.4.1-2016 'Management System';
  - 2.8. Lithuanian Hygiene Standard HN 73:2018 'Basic Standards of Radiation Protection' approved by Order No 663 of the Minister of Health of the Republic of Lithuania of 21 December 2001 on approval of the Lithuanian Hygiene Standard HN 73:2018 'Basic Standards of Radiation Protection';
  - 2.9. Nuclear Safety Requirements BSR-1.9.3-2016 'Radiation Protection at Nuclear Facilities' approved by Order No 22.3-95 of the Head of VATESI of 6 October 2011 on approval of the Nuclear Safety Requirements BSR-1.9.3-2016 'Radiation Protection at Nuclear Facilities';

2.10. Nuclear Safety Requirements BSR-1.9.1-2017 ‘Standards of Release of Radionuclides from Nuclear Facilities and Requirements for the Plan of Release of Radionuclides’ approved by Order No 22.3-89 of the Head of VATESI of 27 September 2011 on approval of the Nuclear Safety Requirements BSR-1.9.1-2017 ‘Standards of Release of Radionuclides from Nuclear Facilities and Requirements for the Plan of Release of Radionuclides’;

2.11. Nuclear Safety Requirements BSR-1.8.2-2015 ‘Categories of Modifications of a Nuclear Facility and Description of the Procedure for Performing Modifications’ approved by Order No 22.3-99 of the Head of VATESI of 7 October 2011 on approval of the Nuclear Safety Requirements BSR-1.8.2-2015 ‘Categories of Modifications of a Nuclear Facility and Description of the Procedure for Performing Modifications’;

2.12. Emergency preparedness requirements for the organisation operating a nuclear facility approved by Order No 22.3-50 of the Head of VATESI of 24 October 2008 on approval of the emergency preparedness requirements for the organisation operating a nuclear facility;

2.13. Nuclear Safety Requirements BSR-3.2.1-2015 ‘Radioactive Waste Acceptance Criteria for a Near Surface Disposal facility’ approved by Order No 22.3-103 of the Head of VATESI of 27 May 2015 on approval of the Nuclear Safety Requirements BSR-3.2.1-2015 ‘Radioactive Waste Acceptance Criteria for a Near Surface Disposal facility’;

2.14. Nuclear Safety Requirements BSR-1.4.2-2014 ‘Management of Construction of a Nuclear Facility’ approved by Order No 22.3-22 of the Head of VATESI of 29 January 2014 on approval of the Nuclear Safety Requirements BSR-1.4.2-2014 ‘Management of Construction of a Nuclear Facility’;

2.15. Nuclear Safety Requirements BSR-1.8.3-2017 ‘Technical Specification of a Nuclear Facility’ approved by Order No 22.3-222 of the Head of VATESI of 24 November 2017 on approval of the Nuclear Safety Requirements BSR-1.8.3-2017 ‘Technical Specification of a Nuclear Facility’;

2.16. Nuclear Safety Requirements BSR-1.8.4-2018 ‘Ageing Management of Structures, Systems and Components Important to Safety of a Nuclear Facility’ approved by Order No 22.3-169 of the Head of VATESI of 25 July 2018 on approval of the Nuclear Safety Requirements BSR-1.8.4-2018 ‘Ageing Management of Structures, Systems and Components Important to Safety of a Nuclear Facility’;

2.17. Nuclear Safety Requirements BSR-1.8.5-2018 ‘Commissioning of a Nuclear Facility’ approved by Order No 22.3-295 of the Head of VATESI of 4 December 2018 on approval of the Nuclear Safety Requirements BSR-1.8.5-2018 ‘Commissioning of a Nuclear Facility’.

### **CHAPTER III DEFINITIONS**

3. Definitions of terms used for the purposes of these Requirements:

3.1. **Deep geological disposal facility of radioactive waste** – a facility located underground in a stable geological formation usually several hundred metres or more below the surface for depositing of long-lived or and/or highly radioactive waste.

3.2. **Near surface radioactive waste disposal facility** – a facility for disposal of radioactive waste located at or within a few tens of metres from the earth’s surface.

3.3. **Radioactive waste disposal facility development scenario (hereinafter – the scenario)** – means a description to represent possible future evolution and conditions of a radioactive waste disposal facility based on available data.

3.4. **Monitoring of a radioactive waste disposal facility** – means systematic monitoring, evaluation and forecasting of structures, systems and components (hereinafter – SSC) of a radioactive waste disposal facility and of the natural environment and its elements, changes in their interaction and status.

3.5. Other terms used in the Requirements shall be understood as they are defined in legal acts referred to in paragraph 2 of the Requirements.

## **CHAPTER IV GENERAL SAFETY REQUIREMENTS FOR RADIOACTIVE WASTE DISPOSAL FACILITIES**

4. Practical methods ensuring conformity with safety requirements have to be justified considering safety and implement the defence in depth principle.

5. When operating a radioactive waste disposal facility (hereinafter – the disposal facility) has to be ensured to the fullest extent possible by passive safety means. After the period of active post-closure surveillance of the disposal facility, safety must be ensured solely by passive means.

6. The holder of a licence issued by VATESI specified in Article 22(1)(2) or (3) of the legal act referred to in subparagraph 2.1 of the Requirements (hereinafter – the holder of a licence to operate a disposal facility) and of a licence issued by VATESI specified in Article 22(1)(5) of the legal act referred to in subparagraph 2.1 of the Requirements (hereinafter – the holder of a licence for post-closure surveillance of a disposal facility) must ensure that occupational exposure of the disposal facility resulting from normal operation and unusual events, during and after closure of the disposal facility, does not exceed the limit dose and the public exposure does not exceed the dose constraint specified in the legal act referred to in subparagraph 2.8 of the Requirements and shall be as low as reasonably achievable economic and social factors being taken into account.

7. During site selection, design, construction and closure of the disposal facility safety of the disposal facility shall be ensured through a combination of characteristics of the site, technical solutions of the disposal facility's design, procedures and actions of operation and post-closure surveillance of disposal facilities, radioactive waste characteristics and treatment method. Depending on the hazard potential of radioactive waste (according to radiological and other characteristics) the graded approach shall be adopted for the site selection, design, construction and closure of the disposal facility.

8. The site for a disposal facility shall be selected and design basis solutions and operational technical normative documentation shall be drafted so as to ensure that after-closure safety of the disposal facility is provided by means of multiple safety functions, including systems of radionuclide barriers. The performance of these physical barriers shall be achieved by means of diverse characteristics, and the disposal facility's safety shall not be unduly dependent on a single safety function. Radionuclide containment in a deep geological disposal facility in the first instance shall be secured by geological formation qualities.

9. The disposal facility's design shall conform to the technical specification prepared by the builder (client) and coordinated with VATESI. Requirements for the drawing up, coordination and amendments of the technical specification are established in the legal act specified in subparagraph 2.15 of the Requirements.

10. Any measures aimed at retrieval of radioactive waste where this is provided for in the design basis solutions of the disposal facility shall not have an adverse effect on the post-closure safety of the disposal facility.

11. The holder of the licence issued by VATESI specified in Article 22(1) or (3) of the legal act referred to in subparagraph 2.1 of the Requirements (hereinafter – the holder of the licence to construct a disposal facility), the holder of the licence to operate a disposal facility, the holder of the licence for post-closure surveillance of a disposal facility (hereinafter – the licence holder) when taking decisions on radioactive waste management at any stage of management of radioactive waste shall consider the impact of such decision on safety in other subsequent stages.

12. A disposal facility shall be designed so that its SSC, including engineered radionuclide barriers are compatible with each other and with the environment and radioactive waste in terms of mechanical, physical, chemical and biological characteristics of SSC.

13. A closed disposal facility shall be subject to surveillance. Depending on the disposal facility's design, periods of active and passive surveillance shall be identified and justified in an operational safety justification report.

14. Any measures provided for in the design to enable corrective actions with radioactive waste already emplaced in a disposal facility shall not have any negative impact on the post-closure safety of the disposal facility.

## **CHAPTER V ORGANISATIONAL MEASURES AND TECHNICAL REQUIREMENTS FOR ENSURING SAFETY OF A DISPOSAL FACILITY**

15. Licence holders shall take organisational and technical safety measures ensuring compliance of the disposal facility with these Requirements and with safety requirements specified in other legal acts.

16. The licence holder shall monitor evolution of SSC important to safety (hereinafter – SSC IS) of the disposal facility and conduct or commission research and development works necessary to ensure safety of the disposal facility.

17. When conducting safety analysis and justification of the disposal facility, taking account of the results of performed research, modelling, testing and monitoring of the disposal facility and when any new circumstances emerge, the licence holder shall supplement the safety analysis report or the activity safety justification report.

18. During the operational period and upon closure of the disposal facility the types of activities, the parts of the organisational structure and installations important to safety of the disposal facility shall be identified based on safety analysis and justification.

19. The design shall include measures for control of performance of radionuclide barriers and changes in radioactive waste characteristics.

20. The licence holder must conduct monitoring of the disposal facility during construction, operation, closure and after closure. When conducting the monitoring the following information shall be collected and updated necessary for:

20.1. ensuring and confirming radiation protection of the public and environment;

20.2. demonstrating that the disposal facility and changes in its SSC are consistent with the requirements set forth in the safety case;

20.3. confirming and improving assumptions provided for in the safety analysis report or activity safety justification report and models used in the safety analysis and justification;

20.4. assessing the characteristics and changes of the site and its host environment;

20.5. taking decisions on safety improvement of the disposal facility;

20.6. drawing up and adjusting the programme of post-closure surveillance of the radioactive waste disposal facility.

21. The holder of the licence to operate a disposal facility in order to ascertain the compliance of radioactive waste with the particular criteria (of the particular disposal facility) for acceptance of radioactive waste packages in the disposal facility (hereinafter – the radioactive waste acceptance criteria) shall check selectively the radioactive waste management activities of radioactive waste generators related to ensuring the compliance with waste acceptance criteria (packages produced for emplacement in a disposal facility, radioactive waste conditioning) and check selectively the compliance of radioactive waste with the radioactive waste acceptance criteria.

22. The holder of a licence to operate a disposal facility must hold and maintain passports of radioactive waste packages, other documents confirming compliance of radioactive waste with the radioactive waste acceptance criteria and specifications on radioactive waste packages. The documents confirming compliance with the radioactive waste acceptance criteria shall contain full information on the radioactive waste treatment type, radionuclide content, quality management measures ensuring compliance of transferred radioactive waste with the radioactive waste acceptance criteria and other factors capable of affecting safety of the disposal facility.

23. The holder of the licence to operate a disposal facility shall ensure that all information that might be relevant to safety in the future accumulated during previous stages of lifetime of the

disposal facility is retained during and after its closure.

24. In observance of requirements of the legal act specified in subparagraph 2.7 of the Requirements the licence holder shall have in place the document preparation, handling, keeping and accounting system.

25. The documentation and assessment of the information and data pertaining to all safety aspects of the disposal facility and the knowledge transfer of staff members during all stages of lifetime of the disposal facility until termination of its post-closure surveillance is to be ensured.

26. The holder of a licence to operate a disposal facility and to maintain a closed disposal facility shall ensure that the following information relating to the disposal facility and its site is retained and, after the revocation of the licence to maintain a closed disposal facility, made available for long-term storage:

26.1. the design of the disposal facility, the safety analysis report, periodic safety assessment reports;

26.2. documents of the assessment of the disposal facility site;

26.3. inventories of radioactive waste placed in the disposal facility;

26.4. passports for packages of radioactive waste placed in the disposal facility;

26.5. records indicating the locations where individual consignments or packages of radioactive waste have been placed in the disposal facility;

26.6. the results of monitoring of the disposal facility;

26.7. radiological monitoring data;

26.8. the information on the operation of the disposal facility (including the disposal facility's modifications, unusual events, etc.), normative technical documentation of the holder of the licence to operate the disposal facility;

26.9. records of non-compliances with the design and nuclear safety normative technical documentation detected during operation and post-closure surveillance of the disposal facility and records of implemented corrective actions;

26.10. the results of monitoring of the disposal facility;

26.11. the data on occupational exposures, discharges, effluents and radiological monitoring.

27. Methods employed for making records shall ensure that records are retained and easily readable without any information loss.

## **CHAPTER VI**

### **ACCEPTANCE OF RADIOACTIVE WASTE IN A DISPOSAL FACILITY**

28. The applicant for the licence referred to in Article 22(1)(1) of the legal act specified in subparagraph 2.1 of the Requirements, taking account of these Requirements and safety analysis and justification, must prepare the radioactive waste acceptance criteria for the disposal facility.

29. The radioactive waste acceptance criteria for the disposal facility shall be prepared considering the scenario of an inadvertent intrusion after termination of the post-closure surveillance of the disposal facility. Under this scenario, it shall be envisaged that the intrusion occurs immediately after the termination of the post-closure surveillance of the disposal facility. The radionuclide limit activity concentrations shall be set so as to ensure that in the event of an inadvertent intrusion the effective dose received by public does not exceed 10 mSv in a year. The radionuclide limit activity concentrations for very low activity radioactive waste disposal facilities shall be set so as to ensure that in the event of an inadvertent intrusion the effective dose received by public does not exceed 1 mSv in a year.

30. The radioactive waste acceptance criteria shall be drawn up according to radiological, mechanical, physical, chemical and biological characteristics of radioactive waste (e.g., radioactivity, off-gases, heat output, criticality and other properties).

31. Radiological, mechanical, physical, chemical and biological characteristics of radioactive waste should not degrade safety of the disposal facility. Radioactive waste shall be of a solid fraction and shall not contain free liquids. Waste compressibility shall be minimised as far as

practicable. Radioactive waste shall not be easily flammable.

32. Contamination and dose rate of radioactive waste package surface shall not exceed the limits specified in the radioactive waste acceptance criteria. The size of the radioactive waste consignment and packages and mechanical resistance of radioactive waste shall conform to the radioactive waste acceptance criteria.

33. Consideration shall be given to ensuring that safety of the disposal facility is not compromised by measures of accounting for, and control of, nuclear material.

34. The holder of the licence to operate a disposal facility shall develop and implement descriptions of procedures regarding actions with radioactive waste that do not conform to the radioactive waste acceptance criteria. Where the transferred radioactive waste does not conform to the radioactive waste acceptance criteria, such waste may be accepted only if the holder of the licence to operate the disposal facility changes the radioactive waste acceptance criteria by producing evidence that the changes in the radioactive waste acceptance criteria will not degrade the level of safety of the disposal facility in operation and after closure.

35. The holder of the licence to operate a disposal facility must draw up the description of procedure describing actions of review and defining measures to be employed to check the conformity of radioactive waste packages emplaced in the disposal facility with the radioactive waste acceptance criteria of the disposal facility.

## **CHAPTER VII REQUIREMENTS FOR SAFETY ANALYSIS AND JUSTIFICATION**

36. The content and level of detail of the safety case shall be commensurate to the disposal facility's hazardousness in consideration of properties of radioactive waste and adapted to the disposal facility's lifetime stage in respect of which the particular document supporting safety is drafted.

37. The safety analysis and justification shall be detailed and systematic. The typical content of the safety analysis report and operational safety justification report is presented in Annex 1.

38. The safety analysis report shall specify and justify the limit values and conditions for the safe operation of the disposal facility parameters, which shall be determined in accordance with the radiation protection requirements for the staff and residents in normal operation and in the event of extraordinary events, and shall be consistent with the limiting assumptions for the safety assessment provided in the safety analysis report.

38<sup>1</sup>. On the basis of the safety analysis and assessment carried out and the safety analysis report referred to in paragraph 37 of the Requirements, a description of the limits and conditions of operational parameters for the disposal facility shall be developed (hereinafter referred to as the "Description"). The Description shall contain a set of rules specifying the operating modes and operating parameter limits for the nuclear facility and its structures, systems and components, and the minimum number and actions of operational staff. The Description shall be based on the standard content of the description of limits and conditions of operational parameters of a nuclear facility as set out in Annex 5 to the Requirements.

39. The safety analysis report shall contain the licence holder's justification regarding the period covered by the safety analysis and justification. Safety shall be assessed for the period during which the radioactive waste is likely to generate the greatest possible exposure to the public and environment. The licence holder must ensure that safety assessment is carried out using only verified and, where practicable, validated calculation models and software.

40. The amount and quality of the safety case and related safety analysis and justification data shall be sufficient for assessing safety of the disposal facility's lifetime stage and for related decision-making. The safety analysis report shall present and justify the safety analysis assumptions, the choices made and decisions taken during analysis. The safety analysis and justification shall be presented consistently, providing for traceability of assumptions, decisions and results of safety analysis. All models, assumptions, input data for calculations, calculation results

and conclusions of analysis of results, other data used for safety assessment shall be described clearly.

41. Prior to operation of the disposal facility, the conformity of the constructed disposal facility with the agreed design shall be ensured. Safety of the disposal facility shall be ensured in the cases of likely impact either of natural or human induced on the disposal facility and likely faults of the disposal facility's SSC.

42. During safety analysis and justification, technical decisions of the disposal facility's design, construction, operation, closure and post-closure surveillance activities and their compatibility with each other must be considered and justified.

43. At each stage of lifetime of the disposal facility, the nuclear safety optimisation principle must be observed considering all present and future stages of lifetime of the disposal facility (operational actions, anticipated post-closure surveillance measures, etc.). The safety analysis report shall describe safety optimisation measures and selected decisions.

44. The safety analysis and justification shall support SSC IS fire safety, consider safety functions carried out by each separate SSC IS, identify their timescales as well as the alternative or additional safety functions for the cases of non-performance or improper performance. The safety of the disposal facility shall not be dependent on a single individual radionuclide barrier, system protecting radionuclide barriers and/or on administrative procedures.

45. The safety analysis and justification shall consider the likely impact of human actions on safety of the disposal facility (e.g., on its radionuclide barriers), including an inadvertent human intrusion into the disposal facility after termination of its post-closure surveillance, by minimising the likelihood of an inadvertent human intrusion into the disposal facility and possible consequences. The envisaged human intrusion prevention measures shall be selected so as not to compromise safety of the disposal facility in operation and after its closure.

46. When performing the safety analysis and justification the applicant or licence holder must identify the data assessment uncertainties important to safety, analyse them and demonstrate that they were taken into account in the safety analysis report.

47. The safety analysis report shall present evidence that workers, public and environment will be protected from hazards posed by radioactive waste disposed in the disposal facility during its operation, closure and after closure.

48. Public doses during operation, closure and after closure of the disposal facility shall be assessed taking account of the critical group. The critical group (groups) shall be selected in consideration of unusual events capable of affecting the disposal facility at any time.

49. The safety analysis report shall identify and analyse indicators contributing to the assessment of dispersion of radionuclides and their environmental impact (e.g., radionuclide concentration, migration of fluxes of radionuclides in the geosphere and biosphere).

50. The safety analysis report shall illustrate the effectiveness of natural and engineered radionuclide barriers of the disposal facility (their ability to retard dispersion of radionuclides during the period provided for in the safety analysis) and demonstrate the ability of radioactive waste package to contain radionuclides for the respective type of radioactive waste.

51. The justification of safety of the disposal facility shall be based on multiple complementary arguments illustrating accuracy of the safety analysis results (e.g., demonstrate the effectiveness of natural and engineered radionuclide barriers by providing safety case studies; simplified estimates additionally demonstrating calculations of assessment of radionuclide dispersion or radiological impact carried out during safety analysis and justification).

52. The safety analysis report shall assess technologies and methods of construction work, including excavation, placing radioactive waste into a disposal facility, backfilling of the disposal facility, gaseous radionuclide and volatile material dispersion, describe safety optimisation measures, such as, e.g., the separation of construction activities from radioactive waste emplacement, the use of remote handling equipment and/or shielded equipment, ventilation of underground facilities.

53. The safety analysis report shall include scenario analysis covering the assessment of

factors capable of compromising safety. Both, natural evolution scenarios and scenarios anticipating events and processes causing disturbance of the foreseen natural post-closure evolution of the disposal facility shall be considered. The situations where even low probability events might result in exposure to excess limit doses have to be considered and technical and/or organisational measures ensuring safety have to be justified.

54. During safety analysis and justification of the closed disposal facility's surveillance stage, all possible post-closure surveillance actions of the closed disposal facility have to be considered. The safety analysis report shall analyse the adequacy of the actions of surveillance of the disposal facility to ensure safety of the disposal facility and the duration of separate periods of surveillance of the disposal facility. Safety of a deep geological disposal facility in the post-closure stage shall not depend on the actions of the post-closure surveillance of the disposal facility.

55. The licence holder shall update the safety case to take account of amendments to legal acts, results of maintenance programmes, changes in composition of radioactive waste to be disposed in the disposal facility, results of analysis of unusual events, results of periodic safety assessments. The safety case shall be updated as soon as practicable to take account of safety implications of new information.

56. The holder of the licence to operate a disposal facility and the holder of the licence for post-closure surveillance of a disposal facility, acting in observance of the legal act referred to in subparagraph 2.1 of the Requirements must carry out periodic safety analysis and justification of the disposal facility in operation and in the post-closure stage, draw up the periodic safety assessment report according to the content specified in Annex 4 to the Requirements and submit it to VATESI for coordination.

## **CHAPTER VIII**

### **SAFETY ANALYSIS AND JUSTIFICATION OF THE SITE OF A DISPOSAL FACILITY SITE**

57. The site shall be selected and its safety analysis and justification shall be carried out in observance of legal acts specified in subparagraphs 2.1 and 2.3 of the Requirements.

58. During safety analysis and justification of the site the features of the site of the disposal facility necessary for ensuring safety of the disposal facility have to be investigated. Any possible uncertainties of the site data have to be considered.

59. The safety analysis and justification shall cover the period during which the public and environment might be exposed to radioactive waste.

60. The safety analysis and justification of the site of the disposal facility shall cover:

60.1. the identification of the original condition of the site and environment (e.g., soil characteristics, relief, groundwater level, etc.) has to be established;

60.2. the expected natural evolution of the site;

60.3. the identification of external factors and processes characteristic of the site that can disturb the activity of the disposal facility;

60.4. the investigation of impact of the disposal facility related factors on safety.

61. When considering potential impact of external hazards of natural and human origin on safety of the disposal facility:

61.1. the information has to be collected about the occurrences of external hazards of natural and human origin on the site of the disposal facility and in its host environment and about their consequences;

61.2. possible events resulting from external hazards of natural and human origin on the site being assessed and its host environment have to be identified and considered. When considering such hazards the size of the host environment within which external hazards of natural and human origin have to be identified and considered shall depend on potential impact of such hazards on safety of the disposal facility.

62. Possible external hazards of natural origin and internal hazards of human origin shall be

considered by:

62.1. assessing human activities and infrastructure situated in the host environment of the site that can affect safety of the disposal facility;

62.2. identifying factors of human origin that can affect safety of the disposal facility;

62.3. applying advanced and validated methods of assessment of the impact of human activities on the disposal facility.

63. Geological formation parameters, mineralogy and petrography, faults and fracturing, paleohydrogeological evolution, long-term stability, geochemical and hydrogeological, properties of gaseous and thermal conductivity, sorption capacity of radionuclides, location, volume and interaction of hydrogeological formations, water amounts, flow rates and directions, physical and chemical characteristics of underground water have to be investigated.

64. To the extent possible, the selected site shall contain minimum amounts of mineral, geothermal and other natural resources.

65. The level of detail of the safety analysis and justification of the site shall be commensurate to the hazardousness of radioactive waste to be disposed in the disposal facility. The typical content of the site evaluation report is presented in Annex 3 to the Requirements.

66. The emergency preparedness measures that will be required for the disposal facility in operation and for its surveillance after closure have to be identified as part of the safety analysis and justification of the site. The emergency preparedness measures have to be revised to take account of changes in characteristics of the site.

67. The ionising radiation and chemical effects of radioactive waste on the site of the disposal facility during normal operation and in cases of unusual events have to be identified as part of the safety analysis and justification of the site.

68. The site of the disposal facility has to be evaluated by analysing and assessing the possibility to apply organisational and technical measures ensuring physical safety. Such analysis shall be performed considering characteristics of the site and its host environment that can affect the application and effectiveness of measures ensuring physical security: topography, infrastructure, meteorological conditions and other factors of the area. The analysis shall encompass the environment intended for keeping or collecting dual-use nuclear items, SSC IS to be protected against misappropriation and terrorist act prevention purposes.

69. Where, during evaluation of the site, any defects of the site are identified that are likely to have adverse effects on safety of the disposal facility at any stage of its lifetime, the design basis technical solutions and organisational measures compensating the defects of the site have to be anticipated. Where the defects cannot be compensated the site shall be recognised as unfit for use.

## **CHAPTER IX DESIGN AND CONSTRUCTION OF A DISPOSAL FACILITY**

70. A disposal facility shall be designed and constructed in observance of legal acts regulating nuclear, radiation and physical safety of the structures of nuclear facilities with a view to ensuring safety of the disposal facility in operation and after closure.

71. A disposal facility shall be designed so that external hazards of natural or human origin, site characteristics (e.g., fires, explosions, ground surface processes, capable faults, earthquakes, floods and other geological, geomorphological, hydrogeological, geochemical, meteorological processes) do not degrade safety of the disposal facility in all stages of its lifetime and contribute to the maximum possible extent to ensuring of its safety (e.g., perform as a natural barrier for radionuclides).

72. A disposal facility shall be designed so that during its operation from all planned accidents the public effective dose limit is 0.2 mSv in a year, and in the case of beyond design basis accidents the public effective dose limit is 5 mSv in a year.

73. Loads imposed on SSC of the disposal facility shall be determined considering all operating modes of SSC in all stages of the lifetime of the disposal facility.

74. The design of a disposal facility shall take account of all postulated events influencing safety of the disposal facility at the time of its commissioning, operation, closure and after closure.

75. The design of a disposal facility shall take account of characteristics of radioactive waste to be disposed in the disposal facility, including fissile material, when present in radioactive waste.

76. The design of a disposal facility shall contain the following information:

76.1. the description of radionuclide barriers (including measures to prevent underground water or groundwater from reaching volume where radioactive waste is disposed);

76.2. the description of drainage systems and of the sampling system for water leaking through volume intended for radioactive waste disposal;

76.3. data demonstrating that radionuclides present in radioactive waste will be contained in the disposal facility for the period not shorter than provided for in the design of the disposal facility;

76.4. planned stages of completion of construction of the disposal facility or its parts;

76.5. the description of the closure of the disposal facility;

76.6. the description of the monitoring of the disposal facility;

76.7. the description of measures ensuring occupational and public radiation safety;

76.8. the description of measures to ensure physical safety of the disposal facility;

76.9. the design basis solutions;

76.10. the classification of all SSC according to their importance to safety and performed functions;

76.11. SSC maintenance, testing, inspections and monitoring of the disposal facility taking account of the ageing processes in observance of the legal act specified in subparagraph 2.16 of the Requirements.

76.12. the initiating events (e.g., SSC fault, the disposal facility's staff errors, an occurrence of human or natural origin in any stage of the lifetime of the disposal facility) likely to cause SSC faults or accidents anticipated in the design.

77. Radionuclide barriers, including radioactive waste form and package, shall be designed so as to ensure the containment of radionuclides in the disposal facility for a period long enough for them to decay to the level preventing adverse environmental effects of ionising radiation. The disposal facility shall be designed so as to prevent heat generated in radioactive waste from degrading the radionuclide containment capacity of the disposal facility.

78. The following safety functions of the operational and pos-closure stage under normal operating conditions and in the cases of unusual events must be ensured:

78.1. the public exposure controls;

78.2. where the evolution of criticality in radioactive waste is possible – the sub-criticality controls;

78.3. where radioactive waste is likely to produce heat or gas – the heat or gas abstraction;

78.4. the containment of radionuclides in the disposal facility.

79. When designing a disposal facility the possibility must be provided to perform construction, including earth, soil and rock excavation works after commencement of its operation and emplacement of radioactive waste. The overlapping of construction, operation or closure activities has to be planned so as to ensure safety both, during operation and after closure.

80. A disposal facility shall be designed optimising the nuclear safety by investigating possible alternative design basis solutions of the disposal facility and implementing the most optimal solutions in the design of the disposal facility.

81. A holder of the licence to construct a disposal facility shall identify and classify SSC according to their importance to safety of the disposal facility in operation and after closure.

82. The design shall include the description of SSC IS maintenance, surveillance, inspections and monitoring of the disposal facility. The description shall be drawn up considering the ageing of SSC.

83. The design basis solutions shall be grounded on legal acts regulating nuclear, radiation and physical safety and building of structures of nuclear facilities, the technical specification agreed with VATESI, the site evaluation report data, the estimates and other documents and/or data with a

view to ensuring safety of the disposal facility in operation and after closure.

84. A disposal facility shall be designed having obtained assurance whether there are any requirements of legal acts regulating different spheres (e.g., construction technical regulations and nuclear safety requirements), binding (established by legal acts) or optional standards the compliance with which when designing the disposal facility would hinder the implementation of other requirements other legal acts or standards and if such requirements exist the compliance with all binding requirements of such documents must be ensured.

85. Equipment of a disposal facility shall be designed so as to facilitate the activities of its maintenance, surveillance and inspections and to minimise the likelihood of unusual events.

86. When designing a disposal facility, passive safety measures have to be chosen, as far as practicable, to ensure safety of the disposal facility (by selecting design basis solutions, giving priority to passive measures). Safety of the disposal facility after the period of active surveillance of the disposal facility has to be ensured only by passive safety measures. Safety of deep geological disposal facilities shall not be based on active surveillance. Performance of passive safety measures and radionuclide barrier functions has to be ensured over the anticipated lifetime.

87. When designing a disposal facility, optimal use shall be made of characteristics of the site of the disposal facility ensuring its safety.

88. A disposal facility shall be designed considering the anticipated normal operation of the disposal facility, possible unusual events and the list of the postulated initiating events.

89. A disposal facility shall be constructed in such a way as to preserve the features of the site and host environment that have been shown in the safety case as contributing to, or ensuring, safety of the disposal facility.

90. During construction of a disposal facility, the licence holder must collect information about the characteristics of the site of the disposal facility and the impact of the disposal facility on them and use such information to adjust assumptions of safety analysis (e.g., data on site features used in the safety analysis) and design solutions.

91. The holder of the licence to construct a disposal facility shall ensure that the disposal facility is constructed in accordance with the construction design of the disposal facility and applying a well proven engineering practice of the nuclear energy industry.

92. Construction activities of a disposal facility must be performed so as to avoid unplanned environmental impact. Methods and technologies should be adapted in the construction design to allow for variations to be encountered such as variations of geological conditions or groundwater conditions.

## **CHAPTER X COMMISSIONING OF A DISPOSAL FACILITY**

93. The purpose of commissioning of a disposal facility shall be to demonstrate that the constructed disposal facility can be operated in a safe manner. Requirements for commissioning of a disposal facility are laid down in the legal act specified in subparagraph 2.17 of the Requirements.

101. The licence holder shall ensure chronological documentation of the process and results of SSC IS commissioning tests. Test documents (conformity assessment documents, certificates, attestations of an independent conformity assessment body, forms specified in the licence holder's management system documents, etc.) shall be retained until termination of post-closure surveillance of the disposal facility.

## **CHAPTER XI OPERATION OF A DISPOSAL FACILITY**

102. The holder of the licence to operate a disposal facility shall operate the disposal facility in observance of legal acts regulating nuclear, radiation and physical safety with a view to ensure safety in operation and in the post-closure stage assumed in the safety case and in such a manner as

to preserve the safety functions that are important to safety after closure of the disposal facility.

103. The operation of the disposal facility shall be carried out in accordance with the normative technical documents approved by the holder of the licence for operating the disposal facility to ensure compliance with the limits and conditions of the disposal facility operating parameters.

104. The holder of the licence to operate a disposal facility shall specify in the management system documents the actions to be taken when:

104.1. an unusual event occurs;

104.2. radioactive waste that does not meet the radioactive waste acceptance criteria is received.

105. The holder of the licence to operate a disposal facility shall draft and implement maintenance, monitoring, inspection and surveillance management system documents of the disposal facility with a view to ensure that SSC IS will function in line with the criteria specified in the design and will be capable of performing its functions during the period of use of SSC IS during operation and after closure of the disposal facility.

106. The holder of the licence to operate a disposal facility shall document the results of SSC IS maintenance, monitoring, testing and inspections, use them for confirming the suitability of the design and operation of the disposal facility and determine the impact of such results on the post-closure safety of the disposal facility. The results of SSC IS maintenance, monitoring, testing and inspections may be used when introducing changes in the design of the disposal facility.

108. During operation of a disposal facility, the holder of the licence to operate the disposal facility must have in place and apply measures necessary for radiological monitoring, perform radiological monitoring and take measures to ensure that activity levels of radionuclides released to the environment do not exceed activity limits set according to requirements of the legal act specified in paragraph 2.10 of the Requirements.

109. All requisite measures have to be adopted to prevent any activity that is likely to pose threat to physical safety of the disposal facility.

109<sup>1</sup>. The holder of the licence to operate a disposal facility must ensure continuous analysis and assessment of the nuclear, radiation and physical safety as well as emergency preparedness of the disposal facility relying on the latest research results, changes in the international nuclear safety standards, own experience and experience of other operators of the nuclear energy industry and that the information obtained is used to provide for safety improvement measures, where on the basis of results of such analysis and assessment the areas in which the nuclear, radiation and physical safety as well as emergency preparedness can be improved are identified. The safety improvement measures shall meet requirements of legal acts regulating the nuclear, radiation and physical safety as well as emergency preparedness and of the nuclear safety technical normative documentation and well proven engineering practice in the nuclear energy sphere (activities based on the use of standardised engineering methods ensuring product quality and providing product quality confirmation results).

109<sup>2</sup>. For the purpose of implementing safety improvement measures the holder of the licence to operate a disposal facility shall develop the safety improvement programme.

109<sup>3</sup>. The safety improvement programme shall specify:

109<sup>3</sup>.1. the safety improvement measures;

109<sup>3</sup>.2. the goals of safety improvement measures;

109<sup>3</sup>.3. the results planned to be achieved;

109<sup>3</sup>.4. the timescales for the implementation of safety improvement measures;

109<sup>3</sup>.5. the persons and subdivisions in charge of the implementation of safety improvement measures;

109<sup>3</sup>.6. other information, if available, necessary for planning, implementation and traceability of safety improvement.

109<sup>4</sup>. The safety improvement programme shall be revised once in a year and amended by removing implemented safety measures and introducing new safety improvement measures, where

appropriate, in observance of provisions of paragraph 109<sup>1</sup>.

109<sup>5</sup>. The holder of the licence to operate a disposal facility must furnish the safety improvement programme and its amendments to VATESI for coordination.

109<sup>6</sup>. VATESI shall coordinate the safety improvement programme and its amendments only having made sure that the safety improvement measures envisaged in the safety improvement programme and its amendments do not contradict requirements of legal acts regulating the nuclear, radiation and physical safety as well as emergency preparedness and of the nuclear safety technical normative documentation. VATESI shall take the decision on coordination of the safety improvement programme or its amendments and shall notify in writing the licence holder not later than within 20 (twenty) business days of the day of receiving the documentation (the draft programme or its amendment).

## CHAPTER XII CLOSURE OF A DISPOSAL FACILITY

110. The holder of the licence to operate a disposal facility must close the disposal facility in observance of legal acts regulating nuclear, radiation and physical safety by introducing and maintaining the post-closure safety functions that have been shown in the safety case.

111. The holder of the licence to construct a disposal facility and/or of the licence to operate a disposal facility shall plan the closure of the disposal facility throughout all stages of its lifetime. The plan for closure of the disposal facility shall be prepared so that the disposal facility's closure can be carried out in a safe manner within the timescales envisaged in the plan for closure of the disposal facility. For this purpose, the plan for closure of the disposal facility shall be drawn up when designing the disposal facility and shall be periodically revised and amended, as appropriate, in consideration of the lifetime stage of the disposal facility, operating experience and available data. The initial plan for closure of the disposal facility and its updates shall be included in the safety analysis report.

111<sup>1</sup>. Prior to the closure of a disposal facility, the holder of a licence to operate or construct and operate a disposal facility shall prepare and submit to the VATESI a final closure plan and, in accordance with the information contained therein and with the provisions of Chapter VII of the Requirements, an updated safety analysis report substantiating the safety of the disposal facility during closure and post-closure.

114. The final plan for closure shall contain the information about:

114.1. the condition of SSC of the disposal facility (capability of SSC to perform the assigned functions taking account of ageing and other similar factors), experience gained during construction and operation of the disposal facility (modifications of the disposal facility, unusual events, etc.) and characteristics of radioactive waste emplaced in the disposal facility;

114.2. the method and technologies of closure of the disposal facility, the actions envisaged for the implementation of such method;

114.3. the assessment of the possibilities to apply the available and planned measures and technologies to be used for closure of the disposal facility;

114.4. the dismantling of SSC that will no longer be needed in the post-closure stage of the disposal facility;

114.5. the backfilling and sealing of the remaining space;

114.6. the reconstruction of the site and host environment;

114.7. the monitoring and surveillance of the disposal facility;

114.8. the goals of ensuring physical protection and general measures to attain such goals. This part shall exclude the information constituting state and/or official secret;

114.9. the retention of records about the disposal facility and radioactive waste emplaced in it;

114.10. the types of surveillance of closed disposal facilities;

114.11. the funding of closure of the disposal facility.

115. *Repealed with effect from 01-05-2019*

### **CHAPTER XIII PERIOD AFTER CLOSURE OF A DISPOSAL FACILITY**

116. The post-closure surveillance shall commence immediately after closure of the disposal facility.

117. The programme of post-closure surveillance of the radioactive waste disposal facility shall be prepared and coordinated in observance of Article 21(3) of the legal act specified in subparagraph 2.3 of the Requirements. The programme of post-closure surveillance of the radioactive waste disposal facility shall describe active and passive measures of surveillance. VATESI shall coordinate the programme of post-closure surveillance of the radioactive waste disposal facility when:

117.1. the programme of post-closure surveillance of the radioactive waste disposal facility meets these Requirements;

117.2. the programme of post-closure surveillance of the radioactive waste disposal facility contains positive conclusions regarding the possibility of safe post-closure surveillance of the radioactive waste disposal facility and such conclusions are supported by objective circumstances and meet these Requirements and other legal acts regulating safety.

118. An applicant for a licence of post-closure surveillance of a disposal facility shall have to demonstrate that during surveillance of the disposal facility and after termination of its surveillance the effective public dose will not exceed the dose limit established in the legal act referred to in subparagraph 2.8 of the Requirements and in the case of inadvertent intrusion after termination of surveillance of the disposal facility the effective public dose will not exceed the limit values specified in paragraph 29 of the Requirements.

119. Measures of surveillance of the disposal facility shall not have a degrading effect on passive barriers of radionuclides and on the performance of functions of the passive radionuclide barriers after closure of the disposal facility.

120. The programme of post-closure surveillance of the radioactive waste disposal facility shall be updated at least once in ten years after closure of the disposal facility. For the purpose of this paragraph the date of closure of the disposal facility shall be and the timescale referred to in this paragraph shall be calculated from the entry into force of the Resolution indicated in Article 21(3) of the legal act specified in subparagraph 2.3 of the Requirements.

121. After closure of a disposal facility, the monitoring of the disposal facility shall be carried out. If, during monitoring, any inconsistencies with the design and nuclear safety technical normative documentation are identified, corrective actions have to be taken in the disposal facility. Monitoring of the disposal facility shall include:

121.1. the radiological and non-radiological monitoring to obtain assurance of the absence of any adverse effect on the environment and public;

121.2. the inspections of SSC IS of the disposal facility to obtain assurance of the performance of safety functions of radionuclide barriers.

122. The passive surveillance shall include restrictions on land use in the area of the disposal facility and other prohibitions imposed during the passive surveillance period.

123. Surveillance of the disposal facility may be terminated only when VATESI coordinates the report on termination of surveillance of the disposal facility submitted by the holder of the licence for post-closure surveillance of the disposal facility. VATESI shall take a decision on the coordination of the report on termination of surveillance of the disposal facility over the timescales set by Article 34(2) of the legal act specified in subparagraph 2.1. The report on termination of surveillance of the disposal facility shall include:

123.1. the list of technical normative documentation of the holder of the licence for post-closure surveillance of the disposal facility in observance of which the surveillance of the disposal facility was carried out;

- 123.2. the description of surveillance activities of the disposal facility;
- 123.3. the description of unusual events occurring during surveillance of the disposal facility;
- 123.4. the description of results of the programme of post-closure surveillance of the radioactive waste disposal facility;
- 123.5. the information about measures that will be necessary after termination of surveillance of the disposal facility and planned methods of implementation of such measures;
- 123.6. the information about measures to be taken to ensure that records specified in paragraph 26 of the Requirements are retained for a period of unlimited duration.
- 124. VATESI shall decide on coordination of the report on termination of surveillance of the disposal facility when:
  - 124.1. the report on termination of surveillance of the disposal facility meets these Requirements;
  - 124.2. the report on termination of surveillance of the disposal facility demonstrates that results of the surveillance programme correspond to the assumptions covered by the safety case providing the assurance of safety of the disposal facility after termination of surveillance of the disposal facility.

#### **CHAPTER XIV REPORTS ON ACTIVITIES CARRIED OUT IN A DISPOSAL FACILITY**

- 125. The holder of the licence of construction, operation or post-closure surveillance of a disposal facility shall submit to VATESI the annual report on activities carried out in the disposal facility, the assurance of the nuclear, radiation and physical safety and the compliance of safeguards with these Requirements and/or with the licence validity conditions by 1 March of the next calendar year.
- 126. The report shall clearly define the activities carried out in the disposal facility during a year and the present condition. The report shall include the information about:
  - 126.1. the quantity, volume, weight, radionuclide content and activity limits of radioactive waste accepted in the disposal facility;
  - 126.2. the changes in the radionuclide content of radioactive waste emplaced in the disposal facility;
  - 126.3. the annual effective occupational doses and assessment of their changes;
  - 126.4. the cases of non-compliance with the radioactive waste acceptance criteria, their reasons and actions after registration of such cases;
  - 126.5. the summary of results of the performed maintenance, monitoring, testing and inspections of SSC IS;
  - 126.6. the summary information on operational experience, occurrence of unusual events, assessment of the occupational and public impact of such events and management of ageing;
  - 126.7. the implementation of the safety improvement programme during the past calendar year specifying:
    - 126.7.1. the implemented safety improvement measures of the safety improvement programme and the documentary evidence of their implementation;
    - 126.7.2. the attained goals;
    - 126.7.3. the achieved results;
    - 126.7.4. the interim results achieved by safety improvement measures under implementation;
    - 126.7.5. the safety improvement measures that have not been implemented and the reasons for not implementing them;
    - 126.7.6. the other information, if any, necessary for planning, implementation and traceability of the safety improvement planning.

**CHAPTER XV  
EMERGENCY PREPAREDNESS**

127. Holders of the licence for construction of a disposal facility, of the licence for operation of a disposal facility and of the licence for post-closure surveillance of a disposal facility must prepare for potential accidents in observance of legal acts referred to in subparagraphs 2.1 and 2.12 of the Requirements.

**CHAPTER XVI  
FINAL PROVISIONS**

128. A person who breaches these Requirements shall be held liable in accordance with the procedure set forth by legal acts of the Republic of Lithuania.

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## **TYPICAL CONTENT OF THE SAFETY ANALYSIS REPORT AND ACTIVITY SAFETY JUSTIFICATION REPORT**

1. Introduction.
2. The general description of the disposal facility (the description of the disposal facility and its structures, systems and components (hereinafter – SSC), location and layout, planned duration and timescales of the individual stages of lifetime of the disposal facility).
3. The nuclear safety requirements, regulations, standards, other technical normative documentation applicable to the disposal facility.
4. The features the site (the site's and regional meteorology and climatology, hydrology and hydrogeology, geology, seismology, geomorphology and topography, geotechnical properties, natural resources, demography, human activities in the area of the site, results of monitoring carried out prior to operation).
5. The properties of radioactive waste (properties of radioactive waste and radioactive waste packages).
6. The description of the radioactive waste management system in the disposal facility (acceptance, verification and emplacement of radioactive packages in the disposal facility).
7. The design base solutions and their justification (the design principles, loads (static, dynamic, cyclic, impact, thermal stress, internal pressure), description of implementation of the defence in depth principle, detailed description of radionuclide barriers, analysis of functioning and interactions of radionuclide barriers to ensure performance of safety functions, identification and quantitative assessment of circumstances and phenomena that are likely to affect the operation of installations).
8. The SSC classification (the description of functions performed by SSC important to safety and their assessment over the lifetime of the disposal facility, the selection, justification, description and evaluation of materials used for manufacturing of SSC, SSC safety functions).
9. The radioactive waste acceptance criteria.
10. Safety analysis and assessment (safety assessment under normal operation, design and non-design accident conditions, taking into account postulated initial events, validity of conservative assessment, management of uncertainties, validity of compliance with safety requirements, limit values and conditions for operating parameters and their technical basis, lifetime and its validity).
11. The safety assessment of the disposal facility in operation and after closure (the description of safety improvement, maintenance, monitoring and inspections, application of operating experience, ageing management, surveillance of the disposal facility, corrective actions with packages that do not conform to the acceptance criteria).
12. Radiological and non-radiological (chemical, biological and thermal (applicable to the disposal facilities with emplaced radioactive waste capable of producing heat)) impact assessment (containment and isolation of radionuclides, assessment of releases of radionuclides to the environment and their transmission, scenarios and models for assessment of radiological and non-radiological effects, evolution of scenarios and models, performance indicators, assessment and optimisation of the public and occupational exposure to radiation).
13. The analysis of external and internal hazards (the identification, selection of hazards assessment of consequences).
14. The description of monitoring of evolution of external hazards of natural and human origin.
15. The summary information on physical safety assurance of the disposal facility.

16. The summary information on accident preparedness.
  17. The plan for closure of the disposal facility.
  18. The description of the post-closure surveillance of the disposal facility.
  19. The summary information on management system.
  20. The management of information (long-term retention of information after closure of the disposal facility, procedures of retention of records ensuring traceability of adopted decisions).
  21. Conclusions of the safety analysis and justification.
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## **TYPICAL CONTENT OF THE RADIOACTIVE WASTE ACCEPTANCE CRITERIA**

1. Radioactive waste characteristics:
    - 1.1. radiological characteristics;
    - 1.2. chemical characteristics;
    - 1.3. physical characteristics;
    - 1.4. biological characteristics;
    - 1.5. mechanical characteristics
  2. Requirements for radioactive waste treatment.
  3. Characteristics of radioactive waste packages:
    - 3.1. package activity limit values;
    - 3.2. total  $\alpha$ ,  $\beta$  and  $\gamma$  activity;
    - 3.3. individual radionuclide specific activity limit values;
    - 3.4. dose rate on the package surface and surface contamination limit values;
    - 3.5. package mass, form, external dimensions, package handling options;
    - 3.6. package mechanical characteristics;
    - 3.7. thermal characteristics;
    - 3.8. physical characteristics.
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## **TYPICAL CONTENT OF THE SITE EVALUATION REPORT OF A DISPOSAL FACILITY**

1. Introduction.
  2. Site characterisation (the location, plan and technical drawings of the site).
  3. Geographic, topographic and geological characteristics of the site and regional host environment.
    - 3.1. Seismic and tectonic data.
    - 3.2. Hydrological and hydrogeological data (the inventory on watercourses, average, maximum and minimum water levels and debits, repetition rate, groundwater levels and flows, soil permeability and porosity).
    - 3.3. Geomorphological, geochemical characteristics.
    - 3.4. Meteorological and climate data.
  4. Regional demographic data and socioeconomic environment of the site.
  5. Industrial or military activities in host environment, land or air transport and other factors that can influence on the safety of the disposal facility.
  6. Forecasted changes in the environment resulting from surface natural processes or impact of human activities during the analysed long-term impact period and after closure.
  7. Factors conducive to the environmental and public exposure in terms of radiation safety.
  8. The assessment of natural hazards (earthquakes, floods, fires, geotechnical site hazards, extreme weather conditions (rain, hail and snow), etc.).
  9. The Assessment of hazards of human origin (an aircraft crash risk, fire, spread of dangerous substances, etc.).
  10. Assessment of public exposures (activity levels of radioactive waste to be emplaced in a disposal facility, characteristics, content and activity levels of releases of radionuclides, assessment of dispersion of radionuclides, assessment of radiological exposure of people, assessment of non-radiological public exposure).
  11. Other aspects of evaluation of safety of the site (the possibility to apply requisite physical safety measures and emergency preparedness measures).
  12. The results and conclusions of the site safety analysis and justification (suitability, shortcomings and compensating measures).
  13. The preliminary radioactive waste acceptance criteria.
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## TYPICAL CONTENT OF THE PERIODIC SAFETY ASSESSMENT REPORT

1. Introduction.
  2. General description of the radioactive waste disposal facility (hereinafter – the disposal facility).
  3. Brief description of structures, systems and components of the disposal facility.
  4. The disposal facility’s conformity to the design, legal acts regulating nuclear, radiation and physical safety and emergency preparedness of the disposal facility and requirements of the technical normative documentation on the nuclear safety:
    - 4.1. Changes of the site and/or host environment of the disposal facility and the description and assessment of related compensating measures.
    - 4.2. Review and assessment of the information collected about factor that influence or can influence the post-closure safety of the disposal facility.
    - 4.3. An assessment of operational activities, hazards and extraordinary events affecting safety.
    - 4.4. Assessment of appropriateness of the assumptions made and data used for safety analysis and justification of the disposal facility.
    - 4.5. Description and assessment of implemented modifications.
    - 4.6. Description and assessment of controls over conformity to and compliance with the criteria of radioactive waste acceptance in a disposal facility.
    - 4.7. Assessment of impact of structures, systems and components important to safety on the disposal facility.
    - 4.8. Assessment of the disposal facility’s compliance with other requirements for the design, legal acts regulating nuclear, radiation, physical safety and emergency preparedness of the radioactive waste disposal facility and of the nuclear safety technical normative documentation requirements.
    - 4.9. Assessment of the condition of the disposal facility safety barriers after closure (for a closed disposal facility)
  5. The latest research results, changes of the international nuclear safety standards, good international practice (publications of the European Nuclear Safety Regulators Group, Western European Nuclear Safety Regulators Association and safety Requirements established by the International Atomic Energy Agency), results of own experience and experience of other entities active in the sector of nuclear energy, safety improvement measures and their implementation timescales.
  6. Description of radiation exposure of the environment and conformity of radionuclides released to the environment, levels of their activities, migration pathways, release modes and points to those established in the plan of release of radionuclides to the environment.
  7. Necessary corrective measures to ensure radioactive waste disposal facility’s conformity to its design and requirements of legal acts regulating nuclear, radiation and physical safety and emergency preparedness and the nuclear safety technical normative documentation (provided that the existing non-conformities with such documents or any non-conformities that can arise until submission of the next periodic safety analysis report are identified during periodic safety analysis) and their implementation timescales.
  8. The deadline for performing the next periodic safety analysis and justification.
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**TYPICAL CONTENT OF THE DESCRIPTION OF LIMITS AND CONDITIONS OF  
OPERATIONAL PARAMETERS**

1. Introduction, purpose and scope.
  2. Responsibilities and minimum number of operational staff.
  3. Definitions and abbreviations.
  4. References.
  5. General organisation of activities and minimum number of operational staff
  6. Limits and conditions for operating parameters.
    - 6.1. Safety assurance of a radioactive waste disposal facility.
    - 6.2. Limits for operational parameters.
    - 6.3. Conditions for safe operation.
    - 6.4. Ensuring the safe operation of a radioactive waste disposal facility.
  7. Parameters of normal operation.
  8. Maintenance of radioactive waste disposal facility equipment.
  9. Emergency at a radioactive waste disposal facility.
  10. Records and record keeping.
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