

## STATE NUCLEAR POWER SAFETY INSPECTORATE

### ORDER NO. 22.3-148 ON THE APPROVAL OF NUCLEAR SAFETY REQUIREMENTS BSR-1.4.4-2019 “USE OF OPERATING EXPERIENCE IN THE FIELD OF NUCLEAR ENERGY”

4 July 2019, Vilnius

Pursuant to paragraphs 1, 4 and 9 of Article 4, paragraph 1 of Article 11, paragraph 12 of Article 32, paragraph 5 of Article 35, paragraph 2 of Article 36 of the Republic of Lithuania Law on Nuclear Safety, and subparagraphs 1 and 3 of paragraph 1 of Article 22 and paragraph 1 of Article 37 of the Republic of Lithuania Law on Nuclear Energy, also subparagraphs 6.16, 7.25, 8.18, 9.12, 18.19 of the Rules for Issuance of Licences and Permits in the Field of Nuclear Energy, as approved by Resolution No. 722 of 20 June 2012 of the Government of the Republic of Lithuania “On the Approval of Rules for Issuance of Licences and Permits in the Field of Nuclear Energy”:

1. I hereby approve Nuclear Safety Requirements BSR-1.4.4-2019 “Use of Operating Experience in the Field of Nuclear Power” (accompanying).

2. I hereby proclaim Order No. 22.3-49 of 26 May 2009 of the Head of the State Nuclear Power Inspectorate “On the Approval of Requirements for Use of Operating Experience in the Field of Nuclear Energy” to be invalid.

3. I hereby establish that the Order herein shall come into force as from 1 November 2019.

The Head of the State Nuclear Power Safety Inspectorate

Michail Demčenko

APPROVED  
By Order No. 22.3-148 of 4  
July 2019 of the Head of the  
State Nuclear Power Safety  
Inspectorate

**NUCLEAR SAFETY REQUIREMENTS  
BSR-1.4.4-2019  
“USE OF OPERATING EXPERIENCE IN THE FIELD OF NUCLEAR ENERGY”**

**CHAPTER I  
GENERAL PROVISIONS**

1. Nuclear Safety Requirements BSR-1.4.4-2019 “Use of Operating Experience in the Field of Nuclear Energy” (hereinafter – the Requirements) set the requirements for use of experience of persons referred to in paragraph 2 of the Requirements and other persons operating in the field of nuclear energy.

2. The Requirements shall be applicable to the licence holders referred to in subparagraphs 1-5 of paragraph 1 of Article 22 of the Republic of Lithuania Law on Nuclear Safety. The licence holders referred to in subparagraphs 6-7 of paragraph 1 of Article 22 of the Republic of Lithuania Law on Nuclear Safety shall follow the provisions set forth in Chapters I, II, V and VI of the Requirements.

**CHAPTER II  
DEFINITIONS**

3. The terms and concepts used in the Requirements shall bear the following meanings:

3.1. **Unusual event important for safety** – a nuclear and/or radiological accident, nuclear incident or any other unusual event during which at least one level of defence in depth at the nuclear facility and/or activities in the field of nuclear energy involving ionising radiation sources becomes ineffective and/or insufficiently effective, and/or assurance of safety functions referred to in technical normative documents on nuclear safety impairs, and/or annual occupational and/or public exposure dose limits or public exposure dose constraints (annual effective dose) are exceeded.

3.2. **Near miss** – an occurrence (or a sequence of occurrences) with no consequences, which could otherwise become the unusual event important for safety.

3.3. **Low-level unusual event** (hereinafter – the low-level event) – an unusual event, the consequences of which do not match those of the unusual event important for safety.

3.4. Other terms and concepts used herein shall bear the meanings defined in the Republic of Lithuania Law on Nuclear Energy, Republic of Lithuania Law on Radiation Protection, and Republic of Lithuania Law on Nuclear Safety.

**CHAPTER III  
GENERAL REQUIREMENTS FOR USE OF INTERNAL AND EXTERNAL  
OPERATING EXPERIENCE IN THE FIELD OF NUCLEAR ENERGY AT THE  
NUCLEAR FACILITIES**

4. The licence holder shall have in place a programme for use of internal and external operating experience in the field of nuclear energy, which shall specify measures intended for screening and analysis of internal and external operating experience in the field of nuclear energy, sharing such experience, and taking preventive and/or corrective actions in order to ensure compliance with the nuclear safety requirements. The programme for use of internal and external

operating experience in the field of nuclear energy shall be officially documented as part of the organisation's management system documentation in the Description of Use of Internal and External Operating Experience in the Field of Nuclear Energy (hereinafter – the Description of Use of Operating Experience) and the Description of Procedure for Notification and Investigation of Unusual Events.

5. The Description of Use of Operating Experience shall:

5.1. establish the policy for use of internal and external operating experience in the field of nuclear energy: the licence holder's commitment to use internal and external operating experience in the field of nuclear energy, improve safety of the nuclear facility in view of internal and external operating experience in the field of nuclear energy, and share it within the organisation and other persons operating in the field of nuclear energy;

5.2. establish the functions and responsibility of those involved in the process of use of internal and external operating experience in the field of nuclear energy;

5.3. establish the sources of usable internal and external operating experience in the field of nuclear energy, the areas for use of results of experience analysis, its goals and objectives;

5.4. establish the procedure for screening, analysis, use and communication of internal and external operating experience in the field of nuclear energy;

5.5. establish the procedure for implementation and control of corrective actions elaborated in view of internal and external operating experience in the field of nuclear energy;

5.6. establish the procedure for communicating internal and external operating experience in the field of nuclear energy to employees;

5.7. establish the procedure for reporting the results of analysis of internal and external operating experience in the field of nuclear energy to the State Nuclear Power Safety Inspectorate (hereinafter – VATESI);

5.8. establish the procedure for updating the training programmes of the licence holders in view of internal and external operating experience in the field of nuclear energy;

5.9. establish the procedure for determining and assessing nuclear safety, radiation protection and physical security (hereinafter – safety) performance indicators of the nuclear facility – measurable characteristics giving quantitative description of the nuclear facility's safety, based on which the licence holder shall assess safety of the nuclear facility – with reference to the assessment criteria set by the licence holder. The safety performance indicators of the nuclear facility shall encompass all aspects that have impact on safety of the nuclear facility, including technical, human and organisational factors. The trend dynamics in safety performance indicators of the nuclear facility shall be analysed at periodic time intervals, but not less than once per quarter, and the analysis results shall be documented;

5.10. establish the procedure and time intervals for assessing effectiveness of the programme for use of internal and external operating experience in the field of nuclear energy.

6. The Description of Procedure for Notification and Investigation of Unusual Events shall specify the procedures for registration, investigation of unusual events, their notification to VATESI and inside the organisation, in compliance with the provisions of Chapters V, VI and VII of the Requirements.

7. The licence holder shall appoint employees responsible for implementation of the programme for use of internal and external operating experience in the field of nuclear energy. These employees shall be authorised to communicate information important for ensuring safety of the nuclear facility to the licence holder's senior management responsible for ensuring nuclear safety, radiation protection, physical security, also for ensuring compliance with non-proliferation commitments and independent supervision of execution of these processes (the head of organisation, deputy head of organisation, heads of units directly accountable to the head or deputy head of organisation) (hereinafter – the senior management of the nuclear facility).

8. Based on the training programmes, the licence holder shall provide training to the senior management and employees operating the nuclear facility on how to identify the unusual events,

conditions causing threat to safe operation of structures, systems and components important for safety, and conditions leading to higher likelihood of error.

9. When the licence holder receives new information about operational experience in the field of nuclear energy, the licence holder shall assess its importance for safety of the nuclear facility and take actions to avoid adverse effects on safety and to prevent from similar unusual events. Information significant for safe operation of the nuclear facility shall be communicated to the senior management of the nuclear facility.

10. The licence holder shall provide as much human, technological and financial resources as it is necessary for effective implementation of the programme for use of internal and external operating experience in the field of nuclear energy (based on the effectiveness assessment criteria set by the licence holder).

11. Information about internal and external operating experience in the field of nuclear energy shall be collected, managed and retained in a way that enables its systematic search, screening and analysis.

## **CHAPTER IV**

### **SCREENING AND ANALYSIS OF INFORMATION ABOUT USE OF INTERNAL AND EXTERNAL OPERATING EXPERIENCE IN THE FIELD OF NUCLEAR ENERGY**

12. At the time of screening and analysis of internal and external operating experience in the field of nuclear energy, the licence holder shall determine importance of information about such experience in terms of safety, reasonableness of its use, and priority of corrective actions, if any.

13. Screening and analysis shall be carried out on a systematic basis, with reference to the Description of Use of Operating Experience, which shall define the time intervals at which the sources of experience of licence holders and other persons operating in the field of nuclear energy (as per subparagraph 5.3 of the Requirements) shall be reviewed, the screening criteria, and the cases when it is necessary to perform analysis of root causes (revealing why the unusual event becomes possible) or analysis of low-level and near miss events based on statistical methods intended for determining changes relating to safety of the nuclear facility (hereinafter – the trend analysis of low-level and near miss events).

14. Screening and analysis of external operating experience in the field of nuclear energy shall cover assessment of the following:

14.1. adaptability of information inside the organisation and at the nuclear facility;

14.2. whether the nuclear facility uses similar structures, systems and components, and has similar technological processes;

14.3. whether the nuclear facility or the nuclear site may be exposed to external threats of similar nature;

14.4. whether the nuclear facility has similar procedures or operation practice in place that may give rise to a similar issue or cause a similar unusual event;

14.5. whether the nuclear facility, in which the licence holder operates, has a history of similar issues or unusual events;

14.6. possibility of occurrence of a similar unusual event or emergence of a similar issue at the nuclear facility wherein the licence holder operates;

14.7. whether the corrective actions set by the organisations are adaptable inside the organisation and the nuclear facility.

15. The employees conducting screening and analysis of internal and external operating experience in the field of nuclear energy shall have prerequisite competence and authorization. The requirements for authorization and competence of these employees shall be established in the licence holder's management system documentation.

16. Screening and analysis of operating experience at the organisation operating the nuclear facility, when the nuclear facility is a nuclear power plant, shall be conducted by the group of specialists formed in a way that it contains specialists possessing knowledge and experience in the

areas important for the nuclear power plant's safety (for example, in the areas of operation, technical maintenance, nuclear safety, physical security, radiation protection, human factors).

17. The results of screening and analysis of internal and external operating experience in the field of nuclear energy shall be relied upon to establish the corrective actions designated to restore the safety level, prevent from unusual event and/or re-occurrence of an issue, and/or improve the nuclear facility's safety. For the establishment of the corrective actions, the licence holder shall assess the need to improve the management system, as well as the safety and security culture. Implementation of the corrective actions shall be controlled by the licence holder.

18. The results of screening and analysis of the operating experience shall be documented.

## **CHAPTER V REGISTRATION AND NOTIFICATION OF UNUSUAL EVENTS**

19. The unusual events that meet the registration criteria set by the licence holder shall be registered. The registration criteria of unusual events shall enable identification of conditions that have or may have negative impact on safety of the nuclear facility or licensed activities.

20. The system of registration of unusual events shall be user-friendly – ensure unsophisticated entry of data and search for relevant information.

21. In order to ensure a possibility to search for information about unusual events at the nuclear power plants, the unusual events shall be grouped by the cause of unusual event and the affected structures, systems and components. The licence holder may classify the unusual events into other additional groups.

22. The procedure for registration and notification of unusual events shall be documented. In this procedure, the licence holder shall specify the criteria and procedures for registration of unusual events and their reporting inside the organisation, to VATESI and other interested parties, also the contacts, functions and responsibilities of the licence holder's responsible employees.

23. The unusual events important for safety shall be reported to the nuclear facility's senior management.

24. The licence holder shall require that its employees and employees of products important for safety report all unusual events to the licence holder, including the near miss events, also conditions that have or may have negative impact on safety of the nuclear facility and/or licensed activities.

25. The licence holder shall establish measures encouraging employees to report unusual events, conditions causing threat to safe operation of the structures, systems and components important for safety, also conditions leading to higher possibility of error. The employees shall be informed about the use of information obtained from them.

26. In relation to unusual events that meet the notification criteria specified in Annex 1 to the Requirements, the following shall be provided by the licence holder to the contact persons specified on VATESI's official website:

26.1. oral notification. It shall be given immediately, but not later than within an hour after the unusual event has been detected;

26.2. written notification. It shall be given as soon as possible, but not later than within 24 hours after the unusual event has been detected. The written notification shall contain information specified in Annex 2 to the Requirements.

27. Unusual events other than those specified in paragraph 26 of the Requirements shall be reported by the licence holder to VATESI at the licence holder's discretion.

28. As new circumstances emerge following the written notification referred to in paragraph 26.2 herein, the licence holder shall provide an additional written notification to VATESI about new circumstances of the unusual event.

## CHAPTER VI INVESTIGATION OF UNUSUAL EVENTS

29. Investigation of all unusual events shall be carried out in accordance with the descriptions of procedures elaborated and approved by the licence holder. The Description of Procedure for Investigation of Unusual Events shall specify the investigation methods of unusual events, the principles of formation of the licence holder's commissions for investigation of unusual events, in order to ensure objective identification of causes of unusual events, also the deadlines for investigation of unusual events.

30. The deadlines for investigation of unusual events shall be set in proportion to importance of unusual events in terms of safety. Initial assessment of the unusual event important for safety shall be performed immediately, but not later than within an hour following its detection, in order to find out whether it is necessary to implement urgent corrective actions. Investigation of the unusual event shall encompass:

30.1. establishment of order of sequence of the unusual event;

30.2. establishment and analysis of violations of technical normative documents and non-compliances with the management system documentation;

30.3. analysis of direct causes (why it occurred) and root causes (why it became possible) of the unusual event;

30.4. assessment of impact on safety of the nuclear facility (when the unusual event occurs at the nuclear facility), activities of the licence holder, potential effects on employees, population and environment, and, based on the results of the analysis and the International Nuclear and Radiological Event Scale User's manual (IAEA, Vienna, 2008) (hereinafter – the INES Manual), the unusual event shall be classified with reference to the International Nuclear and Radiological Event Scale (hereinafter – INES);

30.5. establishment of corrective actions.

31. As the licence holder chooses the specific method for investigation of the unusual event (or a combination of methods), it shall take into consideration the nature of unusual event and choose such method that allows identifying correctly the root cause of unusual event and the corrective actions to be taken. If the unusual event occurs at the nuclear facility due to the employees' act or omission, such unusual event shall be investigated by methods tailored to analyse the actions of employees.

32. Investigation of unusual event at the nuclear facility shall encompass assessment of similar unusual events that occurred internally and externally at other nuclear facilities, and, given re-occurrence of event, assessment of effectiveness of corrective actions for previous events that were similar in terms of their causes.

33. In order to assess the impact of unusual events on safety of the nuclear facility in cases when a probabilistic approach towards safety analysis can be applied, the probabilistic safety assessment shall be carried out.

34. Unusual events shall be investigated by employees trained to apply the methods of investigation of unusual events in accordance with the procedure set by the licence holder.

35. Investigation of unusual events meeting the criteria specified in Annex 1 to the Requirements shall be completed and the investigation report shall be presented for VATESI's review by the licence holder not later than within 30 calendar days following detection of unusual event. The contents of the investigation report of unusual event is set forth in Annex 3 to the requirements.

36. If new circumstances or facts pertaining to the unusual event emerge following the presentation of investigation report of unusual event to VATESI, the investigation report of unusual event shall be updated and presented to VATESI within 15 calendar days after the moment such information becomes known.

37. When VATESI receives the licence holder's investigation report of unusual event meeting the notification criteria set forth in Annex 1 to the Requirements, it shall conduct analysis of the

unusual event and, based on the results of the analysis and the INES Manual, shall give a final approval for classification of unusual event under INES. If VATESI receives an updated investigation report of unusual event or new information about the causes and/or consequences of the unusual event, VATESI shall conduct repeatedly the analysis of unusual event based on the INES Manual and, in case of changes in classification of unusual event, shall approve a new classification of the unusual event under INES.

38. When VATESI identifies that the investigation report of unusual event does not meet the requirements and/or has root deficiencies set forth in paragraph 39 of the Requirements, it shall inform about them the licence holder within 20 working days after receipt of the investigation report of unusual event. The licence holder shall take actions to eliminate the identified deficiencies.

39. The investigation report of unusual event is considered to have root deficiencies in case of:

39.1. inappropriate identification of direct and/or root causes of unusual event and/or corrective actions that do not eliminate direct and/or root causes of unusual event and do not prevent from re-occurrence of unusual event;

39.2. failure to identify the root cause of unusual event by the licence holder.

40. Within 20 working days after receipt of investigation report of unusual event, VATESI shall also inform the licence holder about the final classification of unusual event under INES.

41. The investigation reports of unusual events and unusual event records shall be retained by the licence holder until the end of the term of activities of the licence holder.

42. When seeking to identify the deficiencies in safety of the nuclear power plant and conditions that, without taking the preventive actions, could later have negative impact on safety of the nuclear power plant, the licence holder operating the nuclear power plant shall conduct the trend analysis of low-level and near miss events. The trend analysis of low-level and near miss events shall cover an analysis of equipment failures, deficiencies of work of employees, and organisational deficiencies.

43. The results of the trend analysis of low-level and near miss events shall be documented and presented to VATESI at least once over six months.

## **CHAPTER VII INDEPENDENT INVESTIGATION OF A NUCLEAR AND/OR RADIOLOGICAL ACCIDENT**

44. Independent investigation of a nuclear and/or radiological accident (hereinafter – the accident) shall be carried out under VATESI’s jurisdiction by the accident investigation commission formed by order of the Head of VATESI (hereinafter – the Investigation Commission).

45. The purpose of independent investigation of the accident is to collect evidence and information about the accident circumstances, and to identify its causes.

46. During the accident investigation, information may be obtained by:

46.1. interviews with the licence holder’s employees and suppliers of services/products and/or contracted workers. The Investigation Commission may make video and/or audio recordings of the interviews;

46.2. review of the location and/or equipment pertaining to the accident. During the review, the Investigation Commission may take photos and make video recordings without prejudice to the procedure established by the licence holder;

46.3. investigation of the licence holder’s documents, video recordings, photos, audio recordings.

47. The licence holder shall:

47.1. provide the Investigation Commission, in a prompt manner, with all the information, documents, video and/or audio recordings necessary for the accident investigation;

47.2. organise, in a prompt manner, participation of the senior management and specialists responsible for operation or technical maintenance, monitoring and examination of equipment related to the accident, at the interviews held by the Investigation Commission;

47.3. ensure that the members of the Investigation Commission have unrestricted access to the licence holder's territory and premises or other location where the accident has occurred;

47.4. provide the members of the Investigation Commission with special equipment and other individual protective measures;

47.5. inform the members of the Investigation Commission about the circumstances posing a health risk before entering the licence holder's territory and premises;

47.6. provide the members of the Investigation Commission conducting the investigation with premises necessary for work and, if necessary, technical and communication means.

48. The Investigation Commission shall initiate the accident investigation immediately following the Investigation Commission's formation. The licence holder shall be informed in writing about initiation of the accident investigation immediately, but not later than within 3 working days after the date of signing the order of the Head of VATESI regarding formation of the Investigation Commission, with the copy of the Head of VATESI's order attached.

49. During the accident investigation, the Investigation Commission shall:

49.1. initiate the visits of the Investigation Commission and visit the accident location, provided this does not pose any health risk to the members of the Investigation Commission, where it shall examine the accident location, determine the range of impact, document the situation (prepare its description, take photos, make video recordings), interview the persons who have information about the accident, and obtain their written explanations;

49.2. identify the senior management members responsible for compliance with the requirements of technical normative documents on nuclear safety, as well as other persons, the actions of which had impact on the accident;

49.3. analyse the technical documentation and determine whether the activities were carried out in compliance with the requirements of the technical normative documents on nuclear safety, and determine the condition of equipment;

49.4. evaluate the management system implemented by the licence holder and determine whether the licence holder has taken actions to prevent the accident;

49.5. analyse the meteorological conditions at the time of the accident and determine their potential impact on the accident;

49.6. perform other actions that are necessary in order to find out the causes of the accident.

50. The work results of the Investigation Commission shall be documented in its report on independent investigation of the accident. The independent investigation report shall describe the course, circumstances, causes of the accident, violations of the technical normative documents on nuclear safety (if any), and classification of the accident under INES.

51. If violation of the requirements of legal acts is noted, the procedure for implementation of sanctions shall be initiated in accordance with the procedure set forth in the Republic of Lithuania Law on Nuclear Safety and in Nuclear Safety Requirements BSR-1.1.4-2017 "Description of Procedure for Implementation of Sanctions of the State Nuclear Power Safety Inspectorate", as approved by Order No. 22.3-106 of 24 October 2011 of the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.1.4-2017 "Description of Procedure for Implementation of Sanctions of the State Nuclear Power Safety Inspectorate".

52. The independent investigation report shall be sent to the licence holder no later than within 3 working days after its approval.

**CHAPTER VIII**  
**COMMUNICATION OF INTERNAL AND EXTERNAL OPERATING EXPERIENCE IN**  
**THE FIELD OF NUCLEAR ENERGY**

53. The licence holder shall establish measures ensuring that information about internal and external operating experience in the field of nuclear energy is communicated to employees who consider it to be relevant due to specifics of their work, and which is relied upon during such processes as training of the licence holder's employees, review of procedure descriptions, management of work, nuclear energy designing and modification, as well as in other cases when safety of nuclear facility and/or activities of the licence holder may be improved.

54. As the licence holder seeks to communicate experience of use of products important for safety to persons who were involved in designing of nuclear facility or manufacture of structures, systems and components important for safety, provided services or fulfilled safety-related work, also, if necessary, seeking to obtain consultation in case of failure of equipment or unusual event, the licence holder shall cooperate with the latter persons.

55. The licence holder shall elaborate and submit to VATESI the review of unusual events at the nuclear facilities, in which the licence holder operates, within 30 calendar days after the end of the second quarter of the current year and the end of the fourth quarter of the current year. The review shall include information about the date, location, consequences, causes, importance for safety, assessment under INES of unusual events, as well as the results of screening and analysis of operating experience of other Lithuanian and foreign nuclear facilities, and corrective actions implemented or planned on the basis of these results.

**CHAPTER IX**  
**ASSESSMENT OF EFFECTIVENESS OF THE PROGRAMME FOR USE OF**  
**INTERNAL AND EXTERNAL OPERATING EXPERIENCE IN THE FIELD OF**  
**NUCLEAR ENERGY**

56. Effectiveness of the programme for use of internal and external operating experience in the field of nuclear energy, including adequacy of resources allocated for implementation of the programme, shall be assessed at the nuclear facility by the licence holder with reference to performance quantitative and/or qualitative assessment criteria, in accordance with the procedure and at time intervals established in the management system documentation.

57. The results of assessment of effectiveness of the programme for use of internal and external operating experience in the field of nuclear energy shall be documented.

**CHAPTER X**  
**FINAL PROVISIONS**

58. The purpose of obtaining personal data referred to in paragraph 46 and subparagraph 47.1 herein is to conduct independent investigation of causes and circumstances of a nuclear or radiological accident, in order to ensure fulfilment of legal obligation set forth in paragraph 2 of Article 27 of the Republic of Lithuania Law on Nuclear Energy. The obtained personal data may be disclosed only to national and municipal institutions and authorities upon their request, if such request is reasonable in view of the need to implement the functions assigned to them. The obtained personal data shall be retained for the periods not longer than those prescribed by the implementing legal acts of the Republic of Lithuania Law on Documents and Archives, and in accordance with the procedure stipulated therein.

59. In the event of failure to comply with the Requirements herein, the person shall be held liable in accordance with the procedure laid down in the legal acts of the Republic of Lithuania.

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## **CRITERIA FOR NOTIFICATION OF UNUSUAL EVENT TO THE STATE NUCLEAR POWER SAFETY INSPECTORATE**

1. The unusual event, the actual or potential consequences of which require immediate implementation of urgent protective actions, and, if necessary, other protective actions aimed at mitigating the risk of harmful effects caused by ionising radiation on population, their property and the environment.

2. Release of radionuclides to the environment, their dispersion on the site of the nuclear facility, inside the nuclear facility and other locations where the licence holder performs its licenced activities, or change in radionuclide conditions due to other reasons:

2.1. that could lead to a situation where public exposure dose constraint (annual effective dose) is exceeded;

2.2. when it was impossible to measure activity of dispersed radionuclides;

2.3. when dispersion of radionuclides inside the nuclear facility, other locations where the licence holder performs its licensed activities, could lead to a situation where occupational and/or public annual dose limits or public exposure dose constraints (annual effective dose) are exceeded;

2.4. in cases other than those referred to in subparagraphs 2.1 and 2.2 of the Criteria for Notification of Unusual to the State Nuclear Power Safety Inspectorate, when excess activity of radionuclides released to the environment, excess dose rate on the site of the nuclear facility or radionuclides in the samples are detected, which imply potential deterioration in the function of confinement of radionuclides at the nuclear facility.

3. Operation of the nuclear facility in the mode that has not been defined in the description of parameter limit values and conditions of operation of the nuclear facility, technical regulations or operating procedure descriptions, or safety of which has not been justified in the safety analysis report or other safety supporting documents.

4. Errors and other deficiencies detected by the licence holder in the design of the nuclear facility, safety analysis report or other safety supporting documents, that may affect the results of the nuclear facility's safety analysis and justification.

5. Inappropriate implementation of procedures for inspection, technical maintenance, monitoring and testing of the nuclear facility's structures, systems and components that must be performed under the conditions established in the nuclear facility's design, description of parameter limit values and conditions of operation of the nuclear facility or safety supporting documents, including errors of these procedures leading to operation of the nuclear facility under conditions other than those established in the safety analysis and justification documents.

6. Failures of the nuclear facility's structures, systems and components or human errors that cause malfunctioning of confinement of radionuclides.

7. Fire and smoke occurrences, explosion, meteorological conditions, seismic events, aircraft crash, break-down of external supply of electric power and other effects that were caused by natural phenomena and/or human activities on and off the site of the nuclear facility, thereby preventing from ensuring safety of the nuclear facility.

8. Unusual event encompassing dispersion of radionuclides and/or toxic substances or other events on the site of the nuclear facility that pose threat to safety of the nuclear facility or prevent the employees from safe operation of the nuclear facility.

9. Safety management deficiencies, insufficient resources of the licence holder that lead to deviation from the nuclear facility's normal operating limits and conditions.

10. Unplanned shut-down of the nuclear reactor.

11. Unplanned decrease in power level of the nuclear reactor.

12. Violation of the nuclear facility's physical security barriers, structures, systems and components important for safety or deterioration in their technical condition.

13. Safety malfunctioning.

14. Violation of nuclear fuel management conditions set forth in the nuclear facility design or safety supporting documents.

15. Safety supporting documents do not contain analysis of interaction between the systems that have safety functions.

16. Safety supporting documents do not contain analysis of common cause failures or interconnected failures that may have impact on the results of safety and justification of the nuclear facility.

17. Events during which one-off failure or its cause has resulted in failure of at least one independent channel in a number of systems with safety functions at the nuclear power plant, or failure of two independent channels in the system with safety functions.

18. Common cause failures of structures, systems and components with safety functions.

19. Unusual events important for safety occurring at the time of shut-down or start-up of the nuclear reactor, at the time of loading, handling, storage or transportation of nuclear fuel.

20. Unusual events relating to physical security:

20.1. unlawful occupancy and/or utilisation or other loss of nuclear, nuclear fuel cycle and other radioactive material;

20.2. unauthorised access to the nuclear facility, licence holder's territory, premises or vehicle containing nuclear, nuclear fuel cycle or other radioactive material, or freight of such material;

20.3. intentional damage to the nuclear facility's structures, systems or components important for safety or any other intentional interruption of normal operation of the nuclear facility;

20.4. intentional damage to the physical security systems;

20.5. intentional violation of physical security requirements;

20.6. attempt to perform the activities referred to in subparagraphs 20.1-20.5 of the Criteria for Notification of Unusual Events to the State Nuclear Power Inspectorate.

21. Surface contamination by radionuclides of containers of radioactive waste, packages of radioactive waste and means of transportation and preparation for transportation exceeds the permitted limits set in the legal acts and technical normative documents, except for cases when it is detected at the time of formation of radioactive waste package.

22. Dose rate on the surface of containers of radioactive waste, packages of radioactive waste and means of transportation and preparation for transportation exceeds the permitted limits set in the legal acts and technical normative documents, except for cases when it is detected at the time of formation of radioactive waste package.

23. Fall-down of nuclear fuel assemblies, radioactive waste containers, radioactive waste packages, including other heavy freight or other events leading to actual or potential interruption of functioning of systems important for safety and/or fulfilment of safety functions.

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## **CONTENTS OF WRITTEN NOTIFICATION OF UNUSUAL EVENT**

1. Name of the licence holder.
  2. Name of the nuclear facility, type and nominal capacity of the nuclear reactor (in case the nuclear facility is a nuclear power plant).
  3. Location, date and time of unusual event.
  4. Condition of the nuclear facility prior to the unusual event and at the time of written notification.
  5. Description of the course of unusual event.
  6. Preliminary causes of unusual event.
  7. Consequences of unusual event (initial information), including:
    - 7.1. release of radionuclides to environment and/or occupational exposure;
    - 7.2. damages to structures, systems and components important for safety, by indicating the safety class, type and level of damage (list).
  8. Assessment of importance, actual and potential consequences of unusual event in terms of safety.
  9. Assessment of the level of unusual event with reference to the IAEA’s International Nuclear and Radiological Event Scale and justification of the assessment in accordance with the IAEA’s International Nuclear and Radiological Event Scale User’s Manual (IAEA, Vienna, 2008).
  10. Implemented and planned actions for elimination and mitigation of consequences of unusual event and other corrective actions.
  11. Contacts of employees who can provide additional information about the unusual event (full name, job title, phone number).
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## CONTENTS OF INVESTIGATION REPORT OF UNUSUAL EVENT

1. General information:
  - 1.1. name of the licence holder;
  - 1.2. name of the nuclear facility (in case the unusual event occurs at the nuclear facility);
  - 1.3. location of occurrence of unusual event (in case the nuclear facility is a nuclear power plant – unit);
  - 1.4. type and nominal capacity of the nuclear reactor (in case the nuclear facility is a nuclear power plant);
  - 1.5. commissioning of the nuclear facility (in case the unusual event occurs at the nuclear facility);
  - 1.6. date, location and time of the unusual event.
2. Description of the unusual event, including:
  - 2.1. course and circumstances of the unusual event;
  - 2.2. actions of employees aimed at ensuring nuclear safety, radiation protection and physical security;
  - 2.3. failures of structures, systems and components relating to unusual event and/or other interruptions of operation that had impact on occurrence of unusual event, that went wrong or malfunctioned at the time of the unusual event, and that had impact on its course of development;
  - 2.4. variation in the parameter limit values, conditions of operation of the nuclear facility, and system configurations at the time of unusual event;
  - 2.5. impact on fulfilment of safety functions;
  - 2.6. condition of operation prior to the unusual event, including the mode of operation, as well as condition of structures, systems and components relating to unusual event, and tasks in process in relation to unusual event, or signals observed prior to unusual event;
  - 2.7. condition of structures, systems and components that became inactive since the beginning of unusual event and had impact on emergence and further development of the unusual event;
  - 2.8. causes of failure of structures, systems and components related to unusual event and/or errors of employees, provided they became known at the time of preparation of the unusual event report;
  - 2.9. human and organisational factors that had impact on the course of development and consequences of unusual event, including the actions of employees of the nuclear facility and/or deficiencies of operation procedures, their causes and circumstances;
  - 2.10. manufacturer of the malfunctioning structures, systems and components relating to unusual event, and model series number (or other identification marks).
3. Causes of the unusual event, including:
  - 3.1. the root cause of the unusual event;
  - 3.2. the direct cause of the unusual event;
  - 3.3. the factors accompanying the causes, their identification methods. If possible, the scheme of the course of development, causes and accompanying factors illustrating the results of unusual event analysis shall be attached.
4. Assessment of actual and potential consequences of the unusual event, including potential consequences of the unusual event under other conditions of operation of the nuclear facility, in terms of safety.
5. Assessment of the level of the unusual event with reference to the INES scale, and justification of the assessment in accordance with the IAEA’s International Nuclear and Radiological Event Scale User Manual (IAEA, Vienna, 2008).

6. Impact of ionising radiation on employees, population and environment.
  7. Results of actions for elimination and/or mitigation of consequences of the unusual event.
  8. Corrective actions actually implemented or planned (the deadlines for implementation of all corrective actions and the responsible persons shall be indicated).
  9. The lessons learned.
  10. Information about identical or similar unusual events, if any, at the same nuclear facility and/or at the time of conducting licensed activities.
  11. Information about low-level and near miss events and/or results of their trend analysis, provided they are related to the investigated unusual event at the nuclear facility.
  12. Information about the persons who were informed about the unusual event, including the suppliers, manufacturers of the structures, systems and components, technical support organisations (in case the unusual event was related to their activities).
  13. Contact details of employees who can provide additional information about the unusual event (full name, job title and phone number).
  14. Date of preparation and issue of the report.
  15. Signatures of persons responsible for preparation of the report.
  16. The unusual event investigation report shall be accompanied, where appropriate, by graphic and visual information, for instance, photos, drawings, graphs, diagrams.
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