Decree of the
Nuclear Regulatory Authority of the Slovak Republic
No. 33/2012 Coll. as amended by Decree No. 106/2016 Coll. and decree No. 71/2019 Coll. on the regular, comprehensive and systematic assessment of the nuclear safety of nuclear installations (consolidated version)

The Nuclear Regulatory Authority of the Slovak Republic (hereinafter referred to as ”Authority”), in accordance with Section 23 (2) (g) of Act No. 541/2004 Coll. on the peaceful use of nuclear energy (the Atomic Act) and on the amendment and supplementation of certain Acts as amended by Act No. 350/2011 Coll. (hereinafter referred to as the “Act”) lays down as follows

Section 1
Subject of the Decree

This decree governs the intervals and scope of the performance of regular, comprehensive and systematic assessment of the nuclear safety of the nuclear installations (hereinafter referred to as ”the periodic review”).

Section 2
Intervals and scope of periodic safety review during operation

(1) The authorisation holder shall perform the initial periodic review of the current condition of the nuclear installation as of the date when eight years elapsed since the authorisation for its operation without time limit had entered into force. The authorisation holder shall perform each subsequent periodic review according to the current condition of the nuclear installation as of the date when ten years elapsed since the previous periodic review had been performed.
(2) If the operation authorisation was limited in time or technically in accordance with Section 8 (1) (d) of the Act, the authorisation holder shall perform the first periodic review of the current condition of the nuclear installation as of the date when there are two years before the operation authorisation expiration.
(3) The authorisation holder, upon the performed periodic review, shall confirm the compliance of the current condition of the nuclear installation with its licensing basis as described in the pre-operational safety report valid at the date of performing the periodic review. Any deviations shall be resolved.
(4) The periodic review comprising the objectives and elements of individual areas according to Paragraph (5) is focused on:
a) comparing the level of nuclear safety achieved on the nuclear installation with the current requirements for nuclear safety and with good practice,
b) assessing the cumulative effects of nuclear installation ageing, the effect of modifications to nuclear installation which have been performed or are under consideration, as well as of operating experience and technological development on nuclear safety,
c) determining substantiated modifications to nuclear installation with the aim to maintain the required high level of nuclear safety or increasing it to a level of approaching modern nuclear installations in the world,
d) demonstrating that the required level of nuclear safety is ensured until the next periodic review, based on global safety assessment of the nuclear installation.
(5) The safety factors of the periodic review are:
a) the nuclear installation design,
b) the actual condition of the nuclear installation,

c) equipment qualification,
d) ageing management,
e) deterministic safety analyses,
f) probabilistic safety assessment,
g) unintentional internal hazards and unintentional external hazards to nuclear installation,
h) nuclear installation safety performance,
i) use of experience from other nuclear installation and research findings,
j) organisation, the management system, and safety culture,
k) procedures,
l) human factors,
m) emergency planning,
n) radiological impact on the environment,
o) safety of long-term operation of the nuclear installation (hereinafter referred to as "long-term operation").

(6) On the basis of the performed periodic review, the authorisation holder shall identify and evaluate the safety significance of detected deviations from the applicable current safety requirements of national and international currently applicable good practice, considering operating experience, relevant research findings as well as the current state of technology.

(7) On the basis of the review results for each safety factor and reflecting their possible interactions, the authorisation holder shall elaborate overall safety assessment of the nuclear installation until the next periodic review and demonstrate adequate confidence in safety of the nuclear installation for continuation of operation. This assessment shall highlight any issues that might limit the future safe operation of the nuclear installation and explain how they will be managed.

(8) The authorisation holder shall submit to the Authority the report on the periodic review within 12 months of the date when the periodic review was performed.

(9) The report on the periodic review shall contain:

a) a brief description of the periodic review performed, specifying its objective, scope, procedure, sources used and summary of references to the most important used and elaborated documentation,
b) the results of the nuclear safety assessment in the individual safety factors pursuant to Paragraph (5),
c) the summary of the results of the global safety assessment of the nuclear installation,
d) an integrated implementation plan of the proposed corrective measures and safety improvements to resolve identified deviations,
e) final evaluation.

Section 3
Intervals and scope of the periodic review during decommissioning

(1) The authorisation holder shall perform the periodic review during decommissioning at the end of every decommissioning stage.[1])

(2) The periodic review in decommissioning is primarily focused on comparing the decommissioning status achieved with the defined final status of the installation in the given stage of the decommissioning and on fulfilling the requirements pursuant to Section 2 Paragraph (4) (a), (c) and (d).

(3) The review areas pursuant to Section 2 (5) are used for the scope of assessment, appropriately.

(4) The authorisation holder shall submit a report on the periodic review for the decommissioning to the Authority in accordance with Section 10 (2) of the Act.

(5) The report on the periodic review for decommissioning shall contain the information pursuant to Section 2 (9), accordingly.

Section 4
Methodology of the periodic review

(1) The review shall use an up to date, systematic and documented methodology considering deterministic as well as probabilistic assessments.
(2) Each safety factor shall be reviewed and findings compared with current nuclear safety requirements as well as good practice, while the safety significance of all findings shall be evaluated.
(3) The objectives of the review of the individual safety factors of the periodic review are established by Section 5 (1), Section 6 (1), Section 7 (1), Section 8 (1), Section 9 (1), Section 9a (1), Section 9b (1), Section 10 (1), Section 11 (1), Section 12 (1), Section 14 (1), Section 15 (1), Section 16 (1), Section 17 (1) and Section 18 (1).
(4) The objects of the review of the individual safety factors are established by Section 5 (2), Section 6 (2), Section 7 (2), Section 8 (2), Section 9 (2), Section 9a (2), Section 9b (2), Section 10 (2), Section 11 (2), Section 12 (2), Section 14 (2), Section 15 (2), Section 16 (2), Section 17 (2) and Section 18 (2).
(5) The global safety assessment of the nuclear installation shall consider all positive and negative findings and their cumulative effects on nuclear safety. The reasonable and practicable safety improvements shall be identified.

Section 5
Nuclear installation design

(1) The objective of the periodic review of the nuclear installation design is to determine and assess the adequacy of the design and its documentation by assessment against the requirements for ensuring of nuclear safety and good practice, valid at the time of performing the periodic review.
(2) The authorisation holder shall examine by the periodic review:
a) the detailed description of the design, including schemes and drawings of classified equipment, whether this description is complete, up-to-date, and available,
b) the safety concept of the design according to the original requirements and safety requirements valid at the time of performing the periodic review,
c) the compliance of the current condition of the nuclear installation with the nuclear installation design,
d) important positive and negative deviations between the condition of the nuclear installation at the time of safety review and the valid nuclear safety requirements for the new nuclear installation design at the time of safety review,[2])
e) the list of classified equipment and their assignment to safety classes.

Section 6
Actual condition of the nuclear installation

(1) The objective of the periodic review is to determine and assess the actual condition of classified equipment and to compare the actual status with the project requirements. It comprises also verification, that the actual conditions are properly documented.
(2) The authorisation holder shall examine by the periodic review:
a) data on integrity and functional capability of classified equipment,

b) data on evaluation of the classified equipment lifetime,
c) the scope and results of in-service inspections, inspections and maintenance, which shall demonstrate the functional capability of classified equipment,
d) a description of the current physical condition and technical status of classified equipment,
e) a description of the condition of supporting equipment located on the site or in the vicinity of he nuclear installation,
f) the benefit of modifications to nuclear installation which affects nuclear safety and were implemented since the previous periodic review,
g) management of the documented information of the nuclear installation.

Section 7
Equipment qualification

(1) The objective of the periodic review of equipment qualification is to determine whether the classified equipment is qualified to perform the assigned safety functions.
(2) The authorisation holder shall examine by the periodic review:
a) a list of the classified equipment and compliance with the requirements for assignment to safety classes,[3]),
b) requirements for the qualification of classified equipment,[4]),
c) monitoring and evaluation of the characteristics of the environment, the effects of which the classified equipment is exposed to,
d) documentation of the qualification of the classified equipment and verification of their functional capability with respect to the established qualification requirements,
e) surveillance programmes and confirmation of the functional capability of the classified equipment in terms of the established qualification requirements,
f) procedures and measures adopted to maintain the qualification of the classified equipment until the end of their planned service life.

Section 8
Ageing management

(1) The objective of the periodic review of ageing management is to assess whether ageing management is systematically ensured and whether the capability of classified equipment to fulfil its safety functions is ensured until the next periodic review or until the beginning of the decommissioning.
(2) The authorisation holder shall examine by the periodic review:
a) the strategy and documentation of ageing management programmes,
b) the completeness of the list of classified equipment included in the ageing management programmes,
c) records and suitability of selection of the recorded data influencing ageing, as well as data identifying the status of the lifetime of classified equipment,
d) results of monitoring the lifetime and effectiveness of ageing management programmes for irreplaceable classified equipment and programs for managing the ageing of replaceable equipment,
e) acceptance criteria, current and required safety margins for classified equipment,
f) the level of understanding of the physical conditions, dominant ageing mechanisms, current safety margins and other effects, which could limit the service life of classified equipment,
g) possibilities of mitigating the effects of the classified equipment ageing process.

Section 9

Deterministic safety analyses

(1) The objective of the periodic review of deterministic safety analyses is to assess their scope, whether they are up-to-date and what is their quality in the light of the current state of nuclear safety of the design and operation, the actual conditions of classified equipment, analytical methods used, calculation instruments and data, as well as in terms of the condition of the nuclear safety as predicted by the date of the next periodic review. The objective of the deterministic safety analyses review is also to use the analyses in design verification and in assessment of the nuclear installation safety.
(2) The authorisation holder shall examine by the periodic review:
a) required safety analyses and their results,
b) input data used, conditions and justification of the assumptions for safety analyses,
c) analytical methods and computer programs used, as well as their verification and validation,
d) initiating events and their categorisation, acceptance criteria and fulfilment thereof,
e) methods of performing and verifying safety analyses,
f) effectiveness of measures focused on preventing the occurrence and mitigating the effects of incidents and accidents, and the management thereof.

Section 9a
Probabilistic safety assessment

(1) The objective of the periodic review of a probabilistic safety assessment is to assess whether the probabilistic safety assessment is complete, up-to-date and of high quality, and to assess its use for safety enhancement of the nuclear installation.
(2) The authorisation holder shall examine by the periodic review:
a) purpose and content of a probabilistic safety assessment,
b) input data used, conditions and assumptions used in analyses and their justification, the initiating events, and their categorisation,
c) status and validation of the analytical methods and computer programs used,
d) results of the probabilistic safety assessment in the light of the probabilistic safety objectives and whether the risk is sufficiently low and well balanced for all initiating events and operating states,
e) possibilities for enhancing the safety of the nuclear installation arising from the results of the probabilistic safety assessment,
f) compliance of strategies for accident management with the probabilistic models and their results.

§ 9b
Unintentional internal hazards and unintentional external hazards to a nuclear installation

(1) The objective of the periodic review of internal and external hazards to the nuclear installation is to assess the adequacy of the nuclear installation protection against the potential effects of internal and external hazards to the nuclear installation with respect to the current state of the design and operation, the actual conditions of classified equipment and other equipment important to safety, the characteristics of the site of the nuclear installation, analytical methods, safety standards and the level of knowledge achieved, as well as with respect to the conditions predicted by the date of the next periodic safety review.
(2) The authorisation holder shall examine by the periodic review:

a) a list of the internal hazards and external hazards to the nuclear installation that have been considered and their credible combinations, which may affect the safety of the nuclear installation, in particular, in case of internal hazards – internal fire and explosions, internal floods, pipe whips, internal missiles, drop of loads, steam release, hot or cold gas release, vibrations, structural collapse, loss or capacity degradation of air conditioning; in case of external hazards – external fire, floods, extreme natural and weather conditions, including seismic events and the occurrence of tornadoes, electromagnetic interference, human and industrial activities, including explosions in the vicinity of the nuclear installation, earthquakes, lightning strikes, biological effects and aircraft crashes,
b) the determination of the characteristics of likely internal and external hazards to the nuclear installation, including the analytical methods, models, assumptions, criteria and data used for their determination thereof,
c) a strategy and programmes for the long-term monitoring of the site and surroundings of the nuclear installation, including the use of the results obtained for the prevention, mitigation and prediction of the effects of natural phenomena on the nuclear installation,
d) analyses of the response of the nuclear installation to internal and external hazards to the nuclear installation, including an assessment of the interactions of several nuclear installations located on the same site,
e) the fulfilment of specified safety functions, the adequacy of the required interventions by the nuclear installation operating staff in preventing the development or mitigating the consequences of internal and external hazards to the nuclear installation, and the availability of classified equipment and other equipment important to safety, including the operational control room, emergency control room and emergency response centre.

Section 10
Nuclear installation safety performance

(1) The objective of the periodic review of the safety performance is to determine the status of nuclear installation safety performance, its trends and to assess its reliability based on operational records.
(2) The authorisation holder shall examine by the periodic review:
a) system of identification, classification, recording and reporting of operational events,[5])
b) selection and recording of operational data with respect to nuclear safety, including data for safety analyses,
c) system of root causes analysis of incidents, system of feedback analysis and modifications to systems, constructions and components based on these systems,
d) trend analyses of operational data related to nuclear safety, operational safety indicators, system and component reliability and unavailability and the impact of the human factor,
e) quantity, type, form and activity of radioactive waste in nuclear installation and handling thereof,
f) records on the integrity, potential breach of physical barriers for containing radioactive substances, including leaks,
g) records of radiation doses of persons inside the buildings of the nuclear installation,
h) records on the effluents and emissions of radioactive substances to the environment,
i) records of measurements of the radiation situation on the site and near the site of the nuclear installation,
j) regular nuclear safety assessment programme,
k) operating experience and the effectiveness of the feedback system during their use,
l) the definition, specification and meeting of operational and safety objectives.

Section 11
Use of experience from other nuclear installations and research findings

(1) The objective of the review of the use of experience from other nuclear installations and research findings is to determine whether adequate feedback from safety experience from other nuclear installations and research activity results is ensured.
(2) The authorisation holder shall examine by the periodic review:
a) system of collecting and using relevant information from other nuclear installations, and research findings,
b) modifications implemented in the nuclear installation which were initiated by experience from other nuclear installations and research findings.

Section 12
Organisation, administrative management, quality management system and safety culture

(1) The objective of the periodic review of the organisation, administrative management, the quality management system and safety culture is to determine whether the safety culture principles are applied systematically, whether the organisation and management are adequate to ensure safe operation of the nuclear installation and whether the quality management system is systematically applied and complied with.
(2) The authorisation holder shall examine by the periodic review:
a) quality policy and quality objectives,
b) the application of the principle that nuclear safety takes priority over any other aspect of the use of nuclear energy,
c) the management of the documented information of the quality management system,
d) the job description, authority and responsibility of persons who manage, carry out and evaluate work,
e) the application of process-based approach and graded approach,
f) quality management system processes and their interactions, including externally procured processes,
g) the management and evaluation of organisational and personnel changes,
h) ensurance of compliance with Authority's technical and administrative requirements and with generally binding legal documents,
i) the state of summary records on the operational and maintenance history of the nuclear installation,
j) the management of outsourced products and services affecting safety,
k) checking of quality management systems of the suppliers,
l) procedures and principles for the management of technical support,
m) procedures for the application of feedback from detected organisational and management failures,
n) the evaluation of the performance and effectiveness of the quality management system,
o) continuous improvement, including self-assessment and independent assessment,
p) knowledge and experience maintaining system,
q) safety culture standard.

Section 14
Procedures

(1) The objective of the periodic review of procedures is to assess the compliance of the

procedures with the requirements established for document management and nuclear installation operation.
(2) The authorisation holder shall examine by the periodic review:
a) system of approving, introducing and recording changes to procedures,
b) safety limits and operational states,
c) compliance of procedures with the limits and conditions of safe operation,
d) compliance of procedures with the design and the current state of the nuclear installation, the assumptions and results of safety analyses as well as operational experience,
e) system of regular review and updating the procedures,
f) programme of improving the content, format and structure of the procedures,
g) used methods and validation of the emergency operating procedures[6a]) and severe accident management guidelines.

Section 15
Human factor

(1) The objective of the periodic review of the human factors is the comprehensive assessment of the effect of human factor on ensuring the safe operation of the nuclear installation and the assessment of the level of these aspects of the human factors which have an effect on the nuclear safety of the nuclear installation.
(2) The authorisation holder shall examine by the periodic review:
a) the employee training policy, which shall contain at least:
   1. staff selection method of the authorisation holder,
   2. fulfilment of the requirements for a sufficient number of selected employees and professionally qualified employees according to the limits and conditions of safe operation,
   3. fulfilment of requirements for health and mental capability of the employees,
   4. objectives and programmes of the professional training of the authorisation holder's employees,
   5. distribution of responsibilities for the professional training of the authorisation holder's employees,
   6. up-to-date documentation for ensuring the professional training of the authorisation holder's employees,
   7. specialised equipment and technical furnishings thereof,
   8. continuity to other parts of the documentation of the authorisation holder's quality management system,
   9. use of feedback to prevent failures caused by the human factors in the professional training of the authorisation holder's employees,
b) ergonomics and equipment of control rooms and emergency response centres,
c) the effect of human factors on the risk of damage to nuclear fuel and release of radioactive substances into the environment.

Section 16
Emergency planning

(1) The objective of the periodic review of emergency planning is to assess the suitability and effectiveness of the emergency plans, employee preparedness, technical aspects and equipment for mitigation of incidents and accidents pursuant to specific legislation.[7])
(2) The authorisation holder examines by the periodic review:
a) the organisation of emergency response,

b) functions, organisation and means for decision-making in emergency response centres,
c) implementation of training for emergency response personnel and familiarisation of employees and other persons with authorisation to stay on the site of the nuclear installation,
d) implementation of exercises including the implementation of measures resulting from the comprehensive evaluation of exercises and their effect on updating the internal emergency plan,
e) comprehensiveness and quality of elaboration of the documentation and updating of internal emergency plans,
f) cooperation of the authorisation holder with the Authority and competent authorities in the field of civil protection[8]) which are responsible for implementation of the civil protection plans,
g) the adequacy of resources and equipment in managing incidents and accidents.

Section 17
Radiological impact on the environment

(1) The objective of the periodic review of radiological impact on the environment is to determine whether the authorisation holder has an adequate programme for its monitoring and whether the impact identified is in accordance with the applicable limits.
(2) The authorisation holder shall examine by the periodic review:
a) effectiveness of the programme for monitoring the environmental impact of the nuclear installation in terms of the concentration of radionuclides in the air, water and soil, as well as in agricultural products and animal products,
b) comparison of the detected data with the values measured before the nuclear installation started its operation, if such data are available.

Section 18
Long-term operation

(1) The objective of the periodic review of long-term operation is to ensure that the comprehensive long-term operation programme of the authorisation holder to operate the nuclear installation is available and functional. The results of the periodic review of long-term operation demonstrating that the operation is safe are used for justification of long-term operation. Long-term operation is operation executed on the basis of safety assessment, considering the limitations of the processes and properties of systems, structures and components.
(2) The authorisation holder shall examine by the periodic review the comprehensive long-term operation programme consisting of:
a) review of the care for equipment important to safety within the existing equipment qualification programmes, in–service inspection programs, inspection programs, surveillance programmes, maintenance programmes, strategies for the replacement and monitoring of chemical regimes with a view to long-term operation,
b) revalidation of time-limited safety analyses of equipment important to safety with a view to long-term operation,
c) review of ageing management programmes for active and passive equipment important to safety with a view to long-term operation,
d) revision of procedures for the nuclear installation with a view to long-term operation,
e) revision of the system for maintaining of knowledge and experience from the design, start-up and operation of the nuclear installation with a view to long-term operation,

f) verification of the retention of skills, approaches and expertise capacities for nuclear installation safety and whether long-term human resource policy objectives have been developed and are adhered to.

(3) Equipment important to safety referred to in Paragraph 2 means:

a) classified equipment that must be functional during operation to ensure:
   1. pressure boundary integrity of the cooling circuit of the nuclear reactor,
   2. ability to shut down the reactor and maintain it in safe shutdown conditions,
   3. ability to prevent or mitigate the event consequences that may lead to the release of radioactivity,
b) classified equipment, failure of which may preclude adequate performance of the safety functions of the equipment referred to in (a),
c) other equipment credited in the safety assessment of the nuclear installation.

(4) The provisions of Paragraphs 2 and 3 shall be applied to nuclear installations referred to in Section 2 (f) (2) to (5) of the Act, accordingly.

Section 19
Final evaluation

The final evaluation pursuant to Section 2 (9) (d) and the final evaluation during the decommissioning shall contain:

a) an overview of the positive findings identified,
b) an overview of the negative findings identified and their safety significance,
c) an overview and the hierarchy of corrective actions in terms of their significance for resolving negative findings,
d) an overview of findings decisive in assessment of achieved level of nuclear safety of the nuclear installation,
e) a comparison of the examined safety factors with the status ascertained during the previous periodic review,
f) the results of the overall nuclear safety level achieved during the period examined.

Section 20
Updating the documentation after the periodic review

(1) The authorisation holder shall adequately update the documentation specified in Annex No. 1 Point C of the Act on the basis of the periodic review results during operation.

(2) The authorisation holder shall adequately update the documentation specified in Annex No. 1 Point D of the Act on the basis of the periodic review results during decommissioning.

Section 21

This Decree has been adopted in accordance with a legally binding Act of the European Union in the area of technical standards and technical regulations.[9])

Section 22

Nuclear Regulatory Authority of the Slovak Republic decree No. 49/2006 Coll. on periodic safety review shall be repealed.

Section 23
Entry into force

This decree shall enter into force on 1 March 2012.

Marta Žiaková, m.p.

Footnotes:
1) Section 2 (d) of the Decree No. 430/2011 Coll. on nuclear safety requirements.
2) Section 5 of the Decree No. 430/2011 Coll. on nuclear safety.
3) Section 3 of the of the Decree No. 430/2011 Coll. on nuclear safety requirements.
4) Section 3 (3) of the of the Decree No. 430/2011 Coll. on nuclear safety requirements.
5) Decree No. 48/2006 Coll. amended by Decree No. 32/2012 Coll. Laying Down Details on the Manner of Reporting Operational Events and Events in Transportation and Details of Ascertaining Causes Thereof.

6a) Annex 4 to the Decree No 430/2011 Coll. on nuclear safety requirements.

7) Decree No. 55/2006 Coll. laying down details in emergency planning for the event of an incident or an accident as amended by Decree 35/2012 Coll.
8) Section 12 through 14 and Section 15 of the Act No. 42/1994 Coll. on civil protection as amended.
9) Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services.