



REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING
SLOVENIAN NUCLEAR SAFETY ADMINISTRATION

**Fifth Slovenian Report under the
Joint Convention on the Safety of Spent Fuel Management
and on the Safety of Radioactive Waste Management
Answers to questions raised by other contracting parties**





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May 2015

Introductory explanation

This document is one of the products of the reviewing process under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. As a contracting party to that convention Slovenia prepared [a report](#) before the 5th review meeting under that convention and submitted it on 10 October 2014 to be reviewed by other contracting parties. In the following weeks numbers of contracting parties have asked questions expecting further explanations from Slovenia. Slovenia prepared answers before the review meeting and sent them to other parties on 10 April 2015. During the country presentation on 11 May 2015 additionally some answers were orally explained.

This document is summarizing all the questions and answers about radioactive waste management and spent nuclear fuel management. Answers were prepared by the Slovenian Nuclear Safety Administration, the Slovenian Radiation Protection Administration, the Jožef Stefan Institute, the Krško NPP, the Agency for Radwaste Management and the Ministry of Infrastructure.

	Country	Article	Ref. in National Report
	Austria	General	General
Question/ Comment	As Austria cannot identify any reference to Art. 11, 12 respectively, of the Council Directive establishing the Community framework for the responsible and safe management of spent fuel and radioactive waste (Directive 2011/70/Euratom):		
	- Could you specify the status of the national programme in the meaning of the Directive 2011/70/Euratom?		
	- Could you indicate, when the Strategic Environmental Assessment (SEA) of the national programme in the meaning of the Directive 2011/70/Euratom will take place?		
Answer	The Resolution on the 2006–2015 National Programme for Managing Radioactive Waste and Spent Nuclear Fuel was adopted by the Slovenian Parliament in February 2006 which covers all contents required by the Directive. The validity of the national programme expires next year. Therefore, we started to prepare technical basis for revision of National Programme for Radioactive Waste and Spent Nuclear Fuel Management. It is expected that the new programme will be adopted the end of this year. It is expected that the Strategic Environmental Assessment will take place in the middle of this year.		
	Country	Article	Ref. in National Report
	Croatia	General	K
Question/ Comment	It is stated that Slovenia is in the process of revising National Programme for Managing Radioactive Waste and Spent Nuclear Fuel and ARAO is preparing technical basis for the revision. As per Agreement with Croatia, plan for the decommissioning of the Krsko NPP and disposal of LILW, spent fuel and high-level waste (Decommissioning Programme) should be jointly developed. Previous version of the Programme was accepted by the Slovenian Parliament after the Decommissioning Programme has been adopted by the Intergovernmental Commission. New revision of the Decommissioning Programme has not been adopted so far by the Intergovernmental Commission. How is ARAO going to consider Decommissioning Programme as an input to the new revision of the National Programme?		
Answer	Slovenia is aware of this situation and is acting in a proactive and responsible manner. For this reason a special topical workshop was organised in December 2014 with the title Workshop on radioactive waste management in small or shared nuclear programs where the preparation and synchronization of the National Programmes was one of the main topics of the workshop. Regarding the conclusions of the workshop Slovenia will prepare all plans for the Slovenian national solution including financial aspects in a transparent way in order to take timely decisions not impeding the operation of NPP Krško.		
	Country	Article	Ref. in National Report
	France	General	Overview matrix
Question/ Comment	The National Report of Slovenia includes an executive summary, but no overview matrix to be used by the Rapporteur during the Country Group review.		
Answer	The overview matrix will be presented during the Slovenian National Presentation at Country Group Session of the Fifth Review Meeting. See Support Document.		

Country	Article	Ref. in National Report
France	General	Section K

Question/ Comment Section K describes the different areas in which efforts have to be made to improve safety. But this section insists upon what has already been done in this field and is less succinct, for a certain number of items, on the schedules associated to the future actions. In addition, international collaborations and new round of intergovernmental discussions concerning Krsko are not mentioned.

Answer The section, as well as the whole report, describe the situation as it was in the period covered by the report and therefore focuses on the actions already accomplished. As regards the future intergovernmental discussions, they depend on the efforts of both sides. In January 2015, Slovenia nominated the members of its delegation to the Interstate Commission on the Krško NPP and we are currently awaiting the invitation to a meeting of the Interstate Commission. As regards the LILW project, it has already been mentioned in the report that the investment programme for the project was signed by the Minister of infrastructure and spatial planning in summer 2014 and it is now targeted that the repository could start receiving first waste in 2020.

Country	Article	Ref. in National Report
Italy	General	page 10

Question/ Comment In the Summary, the delays registered in the LILW repository of Vrbinja has been described, so that the new target for the operation of the facility is foreseen by 2020.
 Could Slovenia describe what kind of interaction is currently in act between the implementer and the Regulatory Body? Which is the licensing procedure, and timing, that is (will be) applied for the different authorizations of the LILW repository (design, construction, operation, closure and post closure)?

Answer The implementer (ARAO) is responsible and has already started with the preparation of the Safety case for the planned LILW repository. Siting was finished in December 2009. In 2010, the pre-licensing phase for the facility started and it is planned to start the construction in 2017 and operation in 2020. Slovenian Nuclear Safety Administration (Regulatory Body) is responsible for license approval and will regarding the Slovenian legislation be engaged when the Safety case is prepared.

Country	Article	Ref. in National Report
Slovakia	General	p. 10

Question/ Comment The report states that operation of LILW repository is delayed (instead of 2013 now 2020). This is a challenge to Slovenia to succeed with the project within the new deadline taking into account the licensing procedures.

Answer This is the challenge for Slovenia and Slovenia has undertaken it in such a manner. As part of the preparations for the investment, the new version of the safety assessment for the repository was completed in October 2012. Since 2013 the safety report has been in preparation. The field research has continued and all suggested possibilities for optimisation in terms of technical solutions to enhance the LILW repository have been analysed.” The actual regulator-implementer dialogue is very open and any open issues can be discussed. The

implementer shares the documentation prior to the official administrative procedure in order to give the regulator a possibility to get acquainted with the extensive documentation.

Country	Article	Ref. in National Report
Slovakia	General	p. 10; A, 11 and Article 32 B, 17

Question/ Comment The presented section A of the report states the following (quote): „It is now targeted that the LILW repository could start receiving first waste in 2020. The original target for start of operation of the LILW repository was 2013. This delay increases the challenges for the Krško NPP, which has to cope with its limited capacities of the radwaste storage. The limited storage capacities at nuclear facilities call for decisions to be taken and practical solutions to be found. Due to slow progress in the siting and construction of the repository for VLLW, the storage capacities at the NPP are almost exhausted“

In this regard, what is the current free storage capacity for RAW at the Krško NPP and what are the plans on how to handle the limited storage situation in order to provide sufficient storage capacity for the RAW until the operational start time of the VLLW repository ?

Answer Currently free storage capacity in storage cells is estimated to be less than 5%. A new Waste Management Programme is established. It assumes relocation of two Gamma Waste Assay Systems, manipulation equipment and supercompactor out from Rad-Waste Storage Facility. By doing it, additional storage capacity will be made. All manipulation with Rad-Waste packages will be relocated to a new building (Waste Manipulation Building) to be built shortly. By doing this, the Krško NPP will get enough free space to store radwaste on site until VLLW repository is operational.

Country	Article	Ref. in National Report
Slovakia	General	p. 9

Question/ Comment What further management/disposal option are being considered for the waste from operation/decommissioning of your research reactor and for stored operational waste of NPP Krško and the RAW from its decommissioning, that will not meet the WAC for LILW repository?

Answer Waste that will not meet the WAC for LILW repository should be stored in storage facilities for future solutions, either for alter development of LILW disposal solutions or to be combined with SF and HLW disposal.

Country	Article	Ref. in National Report
Slovakia	General	L (Annexes), 109

Question/ Comment Cited from the section L of the report: „One of the highest priorities in the Krško NPP in the last ten years has definitely been to reduce the volume of produced low-level solid radioactive waste. The Krško NPP goal for the period 2005 -2007 was ≤ 45 m3 and for the period 2008 – 2013 ≤35 m3. This task was more or less fulfilled as it can be seen from the following chart, only in 2013 the amount of LILW exceeded the goal.”

In this relation, what was the reason for the excession of the amount of LILW in 2013? What was the volume of the LILW production in 2014?

Answer The reason for exceeding the planned goal of radwaste production in 2013 was the problem of having failed fuel and demanding modifications and work being done in Radiological Control Area. The situation required additional personal protection causing more waste generated.

The volume of the LILW produced in 2014 was 34,4 m3.

Country	Article	Ref. in National Report
Poland	Article 4	p. 65

Question/ Comment Could You give more detailed information about interdependencies among different steps in spent fuel and radioactive waste management?

Answer As stated in the report the interdependencies among the different steps in spent fuel management and radioactive waste management are addressed in the Resolution on the 2006–2015 National Programme for Managing Radioactive Waste and Spent Nuclear Fuel adopted by the Slovenian Parliament in 2006. The producers of radioactive waste and spent fuel have to consider the interdependencies among different steps of their management in the safety analysis report and operating licences. The request to consider interdependencies among different steps in spent fuel and radioactive waste management is also provided in the Rules on Radioactive Waste Management that entered into force in May 2006 and operational document of licences.

Country	Article	Ref. in National Report
Poland	Article 6	p. 67

Question/ Comment Could You give more detailed information about siting requirements for LILW disposal? What is the status of your disposal at the moment?

Answer The siting for the LILW repository finished in December 2009 and after that the licensing phase for construction started. At this moment all necessary reports for the Safety case are prepared and the Final design is under development. During the siting phase the multi parameter prefeasibility study was prepared to compare different potential sites and Local partnerships were also established. Different conceptual designs were developed for three most promising sites and the feasibility study (included also the safety assessment) for the combination of the site and different concept was prepared. On the basis of the study the optimal combination of the site and the concept was proposed and when local community and the government approved the proposed site and the concept the licensing phase was finished.

Country	Article	Ref. in National Report
Poland	Article 7	p. 71

Question/ Comment Could You explain the role of an authorized expert for radiation and nuclear safety?

Answer Since the Republic of Slovenia is too small to maintain the necessary professional support within the government or the public sector, legislation is largely based on expert opinions of the so-called authorized experts. Legislation provides that the regulatory body in a special

administrative procedure identifies a particular legal person having appropriate skills to prepare expert opinions and acquire the status as an authorized expert. Legislation determines when the applicant is obliged to complete the application for acquiring the rights in the area of nuclear and radiation safety with an authorized opinion. Such arrangements relieve the state of financing and procedures for obtaining such expert opinions. On the other hand, the real independence of such opinions may be doubted. Any such doubts are regulated by legislation in force. Any administrative employee acting on a specific case should not to be connected with the opinion and assessment of the authorized expert and may require another or additional expert opinion.

The experts for radiation and nuclear safety are authorized by the SNSA based on the provisions of the Law (Articles 58 and 59) and the Rules on authorised radiation and nuclear safety experts (Rules JV3, see the above-mentioned web page of legislation). The experts can get the authorization in various fields of nuclear and radiation safety for four types of facilities/activities:

1. nuclear and radiation facilities
2. radioactive waste and spent fuel repositories
3. mining works in the scope of exploitations of nuclear mineral raw materials
4. hydrometallurgical and mining tailings repositories

All the fields of authorization can be found in the table of Annex 1 of the JV3 Rules.

The list of experts for all the fields of nuclear and radiation safety and for all four types of facilities/activities can be found (in Slovenian only) on the SNSA's web page (http://www.ursjv.gov.si/si/info/za_stranke/pooblasceni_izvedenci_za_sevalno_in_jedrsko_varnost/).

Country	Article	Ref. in National Report
Bulgaria	Article 8	Section G

Question/ Comment What is the frequency of the periodic safety review for SF storage facilities and RAW storage facilities? Does it required by the legislation?

Answer The frequency of the periodic safety review for every nuclear facility including SF storage and RAW facilities is about 10 years. Article 45 of the Rules JV9 defines that the facility operator of a radiation or nuclear facility shall carry out a Periodic Safety Review of the radiation or nuclear facility so that the application for the approval of the report on the Periodic Safety Review is submitted to the Administration within nine years and six months from the issuing of the facility operating license, in case of the first Periodic Safety Review, and within nine years and six months from the approval of the report on the previous Periodic Safety Review report, in case of subsequent Periodic Safety Reviews.

Country	Article	Ref. in National Report
Croatia	Article 10	G and H

Question/ Comment It is stated that "The basic reference scenario for the geological disposal has been developed, assuming the disposal of spent fuel in 2065". What container types for the spent fuel transportation from the dry storage facility to the spent fuel disposal facility that will be constructed in 2065 have been taken into consideration?

Answer The basis for this scenario was the Programme for the Decommissioning of the Krško NPP and Disposal of Low- and Intermediate-Level

Waste and Spent Fuel from 2004. This programme provides that spent fuel will be prepared for the disposal according to a Swedish model. The Swedish concept was chosen only as a cost estimate basis. The transport of SF from the dry storage facility to the spent fuel disposal facility is an open issue.

Country	Article	Ref. in National Report
Austria	Article 13	G and H, p67

Question/ Comment According the 5th Slovenian JC National Report “It is planned to identify sites for the Spent Nuclear Fuel Repository by 2035 and to propose the site by 2055.”

Can you provide some more details about the next steps?

Answer Because disposal of HLW and SNF from a single nuclear power plant in its own repository is an irrational solution, searching for international cooperation is a logical option. If no joint solution is going to be found, then construction of our own repository will be necessary. The Programme foresees the beginning of operation of the final repository for HLW and spent nuclear fuel in 2065. The locations suitable for site investigations must be selected until 2035, while the locations which are appropriate and publicly acceptable for construction must be chosen until 2055. For the purpose of the project implementation comparison studies, conceptual design and human resources are planned to be prepared by 2035. In the first phase from 2006 until 2015 only works that are necessary for the increased activation of this programme in the next decade are implemented.

Country	Article	Ref. in National Report
Ukraine	Article 13	G,H page 68-69

Question/ Comment Site selection process is described. Are there any prescribed criteria set in national regulations according to which sites are excluded from further consideration as candidate site for disposal facility location?

Answer Art. 8 and Annex 4 of the JV5 Rules specify the requirements on the location characteristic. The sites which can not meet the location criteria are excluded from further consideration as candidate sites for disposal facility location

Rules prescribe the following criteria:

- (1) The site shall be located in an area of seismic and tectonic activity low enough to pose no threat to the repository's isolating capability. The site shall be located in an area of seismic and tectonic activity low enough to pose no threat to the repository's isolating capability.
- (2) The frequency of surface processes such as repository-site flooding, landslides or erosion shall be low enough not to compromise the repository's capability of meeting safety requirements.
- (3) An integral characterisation of the repository's geological environment shall be carried out.
- (4) The site's geological environment shall contribute to the isolation of radioactive waste and to the confinement of releases of radionuclides into the environment, to the repository's stability, and it shall ensure adequate volume capacity and shall have characteristics favourable for repository project implementation.
- (5) The geometric, physical and chemical characteristics of the repository site's geological environment shall retard migration of

radionuclides from the repository into the environment in all phases of the repository's lifetime.

(6) The dependency of the characteristics of the bedrock on future geodynamic phenomena (climate change, neotectonics, seismicity, volcanism, diapirism) shall be low enough to prevent their unacceptable weakening of the isolating capability of the entire repository.

(7) Hydrogeological characteristics and the hydrogeological environment shall retard underground water flows, involve long transfer routes to limit migrations of radionuclides and contribute to safe isolation of waste for the specified time period.

(8) Physical-chemical and geochemical characteristics of the geological and hydrogeological environment shall retard discharges of radionuclides from the repository into the environment and shall not significantly reduce the durability of technical barriers.

Country	Article	Ref. in National Report
Croatia	Article 14	G and H

Question/Comment Within the chapter Design Basis for the LILW Repository it is stated that “the silos structure is 33 m high and 27.3 m in diameter. The base of the silo is approximately 55 m below the elevation of the flood protective platform. ... Two silos are foreseen in the preliminary design, with an overall capacity of 9,400 m³ of LILW”. Is the design of Vrbina facility developed in the line with the best practice in the field? If it so, what is the reference facility for Vrbina repository? Does it mean that two silos are designed for the overall operational and decommissioning LILW over the extended life time of the Krško NPP?

Answer The disposal concept on Vrbina site is developed with the support of the Safety case preparation/development which is in line with the best practice.
The concept is the combination of the surface and geological repositories with lots of reference facilities all around the world. The concept is designed for all radwaste arising on the territory of Slovenia including the extended period of operation of the Krško NPP.

Country	Article	Ref. in National Report
United States of America	Article 14	Exec Summary, pg. 10

Question/Comment The National Report states that the delay in the siting and design of the LILW repository increase the challenges for storage capacity at Krško NPP which has limited capacities for rad waste storage. The new projected start for the repository to start receiving waste is 2020. During your National Country Presentation at the Fifth Review Meeting, please update the latest status on how Slovenia is solving this problem.

Answer The last status of the disposal project will be presented during the Slovenian National Presentation at Country Group Session of the Fifth Review Meeting. See also answer Q.No 7.

Country	Article	Ref. in National Report
Croatia	Article 15	H

Question/Comment It is stated that Safety Case and Safety Assessment for the LILW repository identified five main scenarios. Did SNSA provide any requirements or guidance regarding the selection of the return period for the natural hazards to be considered in the safety case?

Answer The SNSA did provide requirements regarding location and natural hazards with the publication of JV5 Rules. For example the Rules in its

Annex 4 specify that the frequency and intensity of surface processes such as repository-site flooding, landslides or erosion shall be low enough not to compromise the repository's capability of meeting safety requirements.

Country	Article	Ref. in National Report
Ukraine	Article 15	G,H page 75

Question/ Comment It is mentioned in the long-term safety assessment of LILW disposal facility five main scenarios are identified for which analyses were conducted.

Please, describe shortly these scenarios. Whether the possibility of “hot” points due to spent sealed sources disposal have been taken into consideration in the development of the scenarios?

Answer In addition to Normal evolution scenarios four other post closure scenarios were also developed:

- Early degradation of engineering barriers,
- River meandering,
- Changes of hydrological conditions and
- Inadvertent human intrusion.

The safety assessment considered all potential LILW inventory (including spent sealed sources as potential “hot” spots).

Country	Article	Ref. in National Report
Croatia	Article 17	H

Question/ Comment What is the time period for which institutional control must be enforced at the Jazbec site?

Answer The time period is not defined by legislation, however the disposed long lived radionuclides will require institutional control for unlimited period of time.

Country	Article	Ref. in National Report
Ukraine	Article 18	E, page 28

Question/ Comment According national Safety Requirements and Regulations facilities are classified as nuclear, radiation and less important radiation facilities. Please give more information concerning criteria of this classification (the definition of a nuclear facility is only provided at page 29).

Answer Based on the Decree on practices involving radiation (Official Gazette RS, 48/2004):

1. a ‘radiation facility’ is a facility where:

- production or processing of radioactive substances could cause overexposure of members of the public,
- use of radiation sources for irradiation of subjects or foodstuffs with high dose rates which could cause deterministic effects on population,
- an accelerator, which accelerates particles to energy higher than 25 MeV, is used.

2. a ‘less important facility’ is a facility where:

- use of radiotherapeutic devices such as accelerator, device with sealed sources, X-ray machine, are carried out , if they are operating at voltage higher than 150 kV,
- use of fixed devices for industrial radiography, where energy of radiation is higher than 150 keV,
- use of unsealed source, when dealing with unsealed sources is carried out in class I or II,
- accelerator, which accelerate particles to a maximum energy of 25 MeV, is used,
- use of sealed sources, which causes dose rate higher than 1Sv/h at the distance of 1 meter without shielding.

Country	Article	Ref. in National Report
Germany	Article 19	p. 28 (Section E)

Question/ Legislative and regulatory framework
Comment

It is stated that for the main law of the Republic of Slovenia with regard to the safety of spent fuel and radioactive waste, the Ionising Radiation Protection and Nuclear Safety Act (the 2002 Act), an amendment is foreseen in 2014. Are there any changes concerning radioactive waste management to be expected due to the amendment?

Answer There will be no significant changes in the area of radioactive waste management. The main goal of this new revision of the Act is to simplify the process of obtaining a license, especially in the radiation protection area, to comply with the provisions of other relevant Slovenian legislation (e.g. in the area of construction works, spatial planning, mining, energy...) and with the provisions of EU legislation, WENRA reference levels and/or internationally recognised safety standards. A number of amendments were of editorial nature.

Country	Article	Ref. in National Report
Poland	Article 19	p. 27

Question/ What is the status of implementing to Your provisions of law a Directive 2011/70/Euratom (establishing a Community framework for the
Comment responsible and safe management of spent fuel and radioactive waste)

Answer The question is not clear. The table of concordance was prepared and showed that Slovenian legislation includes all requirements of the Directive 2011/70/Euratom. This year the first report will also be prepared as specified by the Directive.

Country	Article	Ref. in National Report
Ukraine	Article 24	B.1.1, page 47

Question/ Dose constraints were used for specific cases (the nuclear power plant, research reactor, uranium mine and central storage facility).
Comment Explain assumptions used to set dose constraints values for each facility. Is it planned to use the dose constraints concept as a design basis of LILW disposal facility as well?

Answer We used international standards, best practices and site characteristics to establish dose constraints for different facilities. The dose constraint for the planning of the LILW repository was set as design condition based on the requirement defined by Annex 4 of the JV5.

	Country France	Article Article 25	Ref. in National Report Section F: p. 59-62
Question/ Comment	The report describes emergency preparedness for crisis situations. But, is there any plan aimed at managing post-accidental situations (in particular for recovery and waste management as waste characterization and segregation, volume reduction and dedicated waste management facilities) ?		
Answer	The short answer is yes. In fact there is a plan for post-accidental situations called "the Post-Accident Strategy after the Nuclear or Radiological Accident". The plan was prepared by the SNSA in 2013 as appendix to the national plan. It covers handling of radioactive waste as well.		
	Country Germany	Article Article 26	Ref. in National Report p. 63 (Section F)
Question/ Comment	Research reactor Slovenia operates a TRIGA Mark II research reactor at the Jožef Stefan Institute in Brinje. What is the current strategy and timescale regarding (a) the continuation of operation of the research reactor, (b) the decommissioning of the research reactor, and (c) the management of TRIGA spent fuel?		
Answer	It is highly likely that the reactor will operate the following 10 years with a possibility of another 10 years. The operating organisation is expected to make a formal decision sometime in the year 2015. Meanwhile, a detailed decommissioning plan will be made. All radioactive waste and material will be handed over to the Agency for Radwaste Management including spent fuel elements.		
	Country Germany	Article Article 26	Ref. in National Report p. 9 (Executive Summary)
Question/ Comment	NPP Krško According to the report, the revision of the programme for decommissioning of the Krško NPP and disposal of low and intermediate level waste (LILW) and high-level waste (HLW) has not been finished and adopted yet. What is the current status of the “new decommissioning plan” (decommissioning and disposal of LILW and HLW)? Are there any changes with respect to the original strategy?		
Answer	The ownership of NPP Krško is shared between two independent member states of the EU, and the ownership is governed by the Bilateral agreement between Slovenia and Croatia. According to the Bilateral agreement both parties (Slovenia and Croatia) are equally in parity manner responsible for the preparation of the revision of the Decommissioning programme of the Krško NPP and disposal of low and intermediate level waste (LILW) and high-level waste (HLW). Slovenia is proactive in pursuing the agreement on new revision of the Decommissioning plan.		
	Country United States of America	Article Article 26	Ref. in National Report (i), pg. 62

Question/ Comment Please elaborate on the provisions for periodically reviewing decommissioning cost estimates and the adequacy of decommissioning funds.

Answer The ownership of NPP Krško is shared between two independent member states of the EU, and the ownership is governed by the Bilateral agreement between Slovenia and Croatia. According to the Bilateral agreement both parties (Slovenia and Croatia) are equally in parity manner responsible for the revision of the preparation of the Decommissioning programme of the Krško NPP and disposal of low and intermediate level waste (LILW) and high-level waste (HLW). According to the Bilateral agreement both countries together should revise the Decommissioning plan every five years. Slovenia is proactive in pursuing the agreement on new revision of the Decommissioning plan. According to the same Bilateral agreement separate Funds were established in both countries. Both Funds are collecting adequate decommissioning funds according to the approved decommissioning plan.

Country	Article	Ref. in National Report
Austria	Article 28	K, p 88 and p 10

Question/ Comment “As part of the preparations for the investment, the new version of the safety assessment for the repository was completed in October 2012, and since 2013 the safety report has been in preparation. The field research has continued and all suggested possibilities for optimisation in terms of technical solutions to enhance the LILW repository have been analysed.” (General Section).
 “It is now targeted that the repository could start receiving first waste in 2020. The original target for start of operation was 2013. This delay increases the challenges for the Krško NPP which has to cope with its limited capacities of the RAW storage. (section K) Taking into account other urgent activities, e.g. related to revision of the NEK Decommissioning Programme and changing in the long-term strategy mainly relevant for SNF, what are the critical milestones to fulfil the shifted schedule and how compliant implementation is assured?”

Answer The main milestones for the construction of the LILW repository in Slovenia are acquisition of Construction permit and start of trial operation.

Country	Article	Ref. in National Report
Montenegro	Article 28	Section J, page 85

Question/ Comment Montenegro express compliments to excellent data base of Slovenia. In the report it is stated when the sealed sources are no longer in use, they become radioactive waste.

1. Could Slovenia provide information who proclaimed DSRS as radioactive waste (SNSA, user or operator)?

Answer DSRSs are proclaimed as radioactive waste when the ownership is transferred from the owner of radioactive source to the Agency for Radwaste Management.

Country	Article	Ref. in National Report
United States of America	Article 28	J , pg. 86

Question/ The report states that, since 2000, waste producers are required to pay a fee in order to transfer a disused source. When accepted, the

Comment future management of source becomes the responsibility of the ARAO. Given the significant financial burden that is implicit with the long-term management and disposal of disused sources, how is an equitable fee established for the waste producer?

Answer Two separate approaches were used for the definition of equitable fee for the waste producers. The “large producer”, in our case this is the nuclear power plant, has to cover the total share of construction and operation costs of the LILW repository. The share is defined according to the required repository volume used by NPP waste. Costs are paid through the Fund. The disposal of disused sources (the so-called “small producers”) is defined as obligatory public service and the equitable fee is defined through public price list prepared and approved by the government and later published in the Official Gazette. Since Slovenia has a small nuclear programme the full fee that would cover the total costs, would be indeed high. To compensate for this and to encourage the owners of disused sources to properly dispose all sources the Government of Slovenia decided to charge only part of costs to the small producers.

Country	Article	Ref. in National Report
Bulgaria	Article 32	Page 12

Question/ Comment The report explains that a dry cask storage facility will be operational in 2018 and the storage capacity of the spent fuel pool was estimated to be sufficient for operation until 2018. Could Slovenia explore a little bit more on the acceptable options for the country if the Dry storage facility construction is delayed due to some reason?

Answer Other options were evaluated and found less optimal than dry storage, specifically:

- wet storage expansion with spent fuel pool reracking - does not provide sufficient capacity for the planned life extension and has inherently lower safety margins for beyond design bases accidents
- fuel reprocessing – would take even more time for implementation than dry storage and would require significant operating strategy changes
- full sell off – not very economically viable and would also require significant national strategy change.

As a contingency action in case dry storage implementation is delayed, wet storage loading strategy would be considered – some beyond design bases loading restrictions (implemented after the Fukushima event) would need to be changed.

Country	Article	Ref. in National Report
Croatia	Article 32	D

Question/ Comment Where does the inventory of Spent Fuel for NPP Krsko take into account the fuel elements that were identified as defected during 2013 outage? What is the status with these elements now?

Answer Some of the fuel elements (2), identified as defected during 2013 outage, were declared as spent fuel and were included in Table 5 (part of Fuel Batch 26B), while other defected fuel elements (4) with higher excess reactivity were tentatively considered as potentially usable if repaired and were consequently not declared as spent fuel.

Country	Article	Ref. in National Report
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	Croatia	Article 32	B
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Question/ Comment Spent Fuel Management Policy is based on “the Decommissioning Programme from 2004”. It is assumed that “spent fuel will be moved from pool to dry storage between 2024 and 2030”. Within chapter Spent Fuel Management Practices it is written that “due to these requirements the storage capacity of the spent fuel pool was estimated to be sufficient for operation until 2018”. It seems pretty clear that the dry storage facility for spent fuel will be constructed earlier than originally planned. What container types have been taken into consideration? Is there any requirement for the highly activated components that will come from the decommissioning of Krsko NPP to be temporarily stored within the same container type?

Answer Currently different types of casks are taken into consideration including dual-purpose metal and multi-purpose canister type container with concrete overpacks.
At this stage the decommissioning issues are not being taken into consideration. Decommissioning requirements will be addressed separately as part of the decommissioning plan. Nevertheless, based on supplier information, considered canisters can be used for storage of highly activated components.

	Country	Article	Ref. in National Report
	France	Article 32	Executive Summary:p.7/section B:p.17-18

Question/ Comment It is explained that waste is treated and packed into drums before being stored at Krsko NPP and Brinje. Could the treatment methods be more accurately described? In particular, how is managed the interdependency between waste storage and future waste disposal in term of Waste Acceptance Criteria?

Answer In the past, NEK used cementation with vermiculite for waste encapsulation. Since 1999 IN-DRUM-DRYING SYSTEM has been in operation. Waste concentrates from waste processing system, sludge and ion exchange resins are dried under vacuum in the stainless steel drums to form dry monoblocks and dried resin. Compressible waste is supercompacted, liquid waste (oils, solvents) is solidified. Burnable waste is incinerated. Incineration products are put in 100 l drum inserted (and encapsulated with cement) in 208 l drum. Final repository WACs are not yet finalized and defined. NEK has appointed members to the Repository WAC Preparation Group. One of the design inputs for the repository from the beginning has been to be able to receive NEK’s waste with minimal or no additional conditioning.
The main treatment methods for the central storage facility are segregation and dismantling (smoke detectors), for NPP Krško these methods are: supercompaction, in drum drying (primary resins and sludge), incineration, and cementation.
The interdependency between the storage and disposal is managed through WAC preparation for the disposal. All the waste streams (that are already in the storage facilities) will be checked if they meet the WAC or need any additional preparation for the disposal.

	Country	Article	Ref. in National Report
	Italy	Article 32	page 12

Question/ Deep geological repository is assured by 2065 and the Swedish concept is used as guideline.

Comment Could Slovenia specify which kind of research activity are currently carried out (or foreseen) for the site selection and which design criteria are taken into consideration?

Answer Slovenia is following dual track approach for deep geological repository. Investigating national option and participating in international efforts.

For the national long-term plan Slovenia is following all available relevant investigations of the rock formations potentially suitable for deep geological repository and preparing parameter database. Siting process has not started and neither it is foreseen for the near future. The Swedish concept was chosen only as a cost estimate basis.

Slovenia is also an active member of different initiatives, and in particular ERDO, that are looking for international solution for HLW and SF repository.

Country	Article	Ref. in National Report
Italy	Article 32	page 13

Question/ Comment Could Slovenia clarify which type of dry storage facility will be operational in 2018 and if it will located at Krsko NPP?

Answer The new interim dry storage facility is considered and will be located at the NPP Krško site. See also response to Question 35.

Country	Article	Ref. in National Report
Italy	Article 32	page 20

Question/ Comment With reference to the radioactive waste categorisation, only quantitative criteria are given for the category 3.1. Could Slovenia specify if quantitative criteria are applied for the other categories, in particular for the thresholds between LLW and VLLW utilized ?

Answer Quantitative criteria are also given for long-lived LILW (category 3.2). Radioactive waste is categorised as long-lived LILW, when the specific activity of alpha emitters exceeds the limitation applying to short-lived LILW (category 3.1). Very low-level radioactive waste (VLLW) is defined in Slovenian legislation as waste for which the SNSA may decide on clearance.

Country	Article	Ref. in National Report
Italy	Article 32	page 22

Question/ Comment Leaking fuel assemblies that potentially can be reused are excluded from the spent fuel. Could Slovenia specify when and where the fuel assemblies will be repaired?

Answer Momentarily the only licensed and viable fuel repair option is inside the Spent Fuel Pit at NEK. A decision for any fuel repair has not been taken yet and will be performed on case by case basis, based on fuel management and fuel integrity requirements.

Country	Article	Ref. in National Report
Poland	Article 32	p. 20

Question/ Comment Could You categorize waste according to Your criteria: the waste contains only alpha emitters and their activity does not exceed the limits for long-lived LILW

Answer If the waste contains only alpha emitters and their activity does not exceed the limits for long-lived LILW, the waste is categorized as short-lived LILW.

Country	Article	Ref. in National Report
Poland	Article 32	p. 24

Question/ Comment What is the status of the studies on the Borst mill tailings pile regarding landslide?

Answer The study about the landslide or liquefaction possibilities of the Boršt pile is being finalized in April 2015. The Slovenian delegation will probably be able to report about it at the review meeting.

Country	Article	Ref. in National Report
Slovakia	Article 32	B, 18

Question/ Comment Section B of the report provides following information „The Krško NPP is using an external services for the incineration of combustible waste and melting of radioactive metallic waste material. “

In this respect, how often are the external services for treatment of the RAW being used and what is the volume of the RAW? Which country is the RAW being transfer to for the treatment and consequently what type of product of the treated RAW is then transferred back to Slovenia (pellets, non-fixed ash, fixed ash in any type of matrix ...)?

Answer All contracts for melting and incineration were, through public tendering, awarded to a company in Sweden. Until now two campaigns of melting of metallic waste and 5 campaigns of incineration of burnable waste have been performed. In the last years combustible waste is sent for incineration every two years. The average volume of the burnable waste is 50 m3. Incineration products (ash, dust,..) are returned to NEK in a matrix: 100 l drum filled with products inserted and cemented in standard 208 l drum.

Country	Article	Ref. in National Report
Slovakia	Article 32	D, 24

Question/ Comment Section D of the report provides following information: „The Central Storage Facility for Radioactive Waste in Brinje is already filled to around 80% of its capacity. “

In this regards, when is the full capacity of the storage assumed to be reached? What is the plan for providing additional storage capacity after the full filling of the storage in Brinje?

Answer It is assessed that the majority of waste arise from the past and is already collected and stored in a storage facility. The annual amount of waste that needs to be stored in the facility is assessed on just two to three cubic meters per year. According to this current capacity will not

be reached before 2025. That is beyond 2020, when operation of the LILW repository is foreseen.

Country	Article	Ref. in National Report
Ukraine	Article 32	B, (iv) page 19

Question/ Comment Radioactive waste volume reduction program at the Krško NPP envisages using of segregation techniques for collecting non-contaminated materials separately, which allows waste streams to be processed separately. Please describe in more detail (for example what measurements are performed to sort materials as contaminated and non-contaminated materials). What is the further management of non-contaminated materials (clearance procedure, est?)

Answer Measures for sorting of contaminated and non-contaminated materials are taken on the site of the waste generation. The responsibility of work leaders, HP technicians and decontamination personnel is to distinguish between none and contaminated waste, perform required measurements, segregation and sorting.
After the material has been proven to be non-contaminated, clearance procedures are used.

Country	Article	Ref. in National Report
Ukraine	Article 32	D (iii), page 24

Question/ Comment Central Storage Facility for Radioactive Waste in Brinje is described in this para, in particular system the water and sewage collecting system. Liquids are discharged after measurements of radioactive contamination show that this is below the regulatory limit. Could you clarify regulatory requirements for discharges: is it prohibited to dilute contaminated liquids and whether chemical characteristics are controlled as well before discharge?

Answer The limit used for liquid discharges is the same for drinking water, as set in legislation. It is prohibited to dilute contaminated liquids. No control of chemical characteristics is being performed.

Country	Article	Ref. in National Report
Ukraine	Article 32	D, page 24

Question/ Comment The waste forms are listed for acceptance at Central Storage Facility for Radioactive Waste in Brinje. Explain if the next steps of management are taken into account in establishing these waste forms?

Answer The main treatment methods for the central storage facility are segregation and dismantling (smoke detectors).

Country	Article	Ref. in National Report
Germany	Article 32.1.1	p. 13 (Section B)

Question/ National Programme

Comment Regarding the resolution on the 2006–2015 National Programme for Managing Radioactive Waste and Spent Nuclear Fuel, are there any plans for updating this national programme? If so, are there any changes of the programme expected, e.g. a changed strategy for handling of spent fuel (e.g., as a result of NPP stress tests after the Fukushima accident)?

Answer The Resolution on the 2006–2015 National Programme for Managing Radioactive Waste and Spent Nuclear Fuel was adopted by the Slovenian Parliament in February 2006 which covers all contents required by the Directive. The validity of the national programme expires next year. Therefore, we started to prepare a new National Programme for Radioactive Waste and Spent Nuclear Fuel Management. It is expected that the new programme will be adopted by the end of this year. It will include a change of strategy as a result of NPP stress tests after the Fukushima accident. Spent fuel will be moved from the pool to dry storage which will be built until 2018.

Country	Article	Ref. in National Report
Germany	Article 32.1.1	p. 13 (Section B)

Question/ NPP Krško

Comment The dry cask storage facility will be operational in 2018. What is the current strategy/status of the dry cask storage facility? Will it be built also in case of terminating the operation of the Krško NPP in 2023?

Which solution for storage of spent fuel is foreseen if the dry storage facility does not start operation in 2018 and there will be no further storage capacity available in the spent fuel pool?

Answer NPP Krško is in the process of evaluation of different dry storage technologies. The Plant is preparing design specification and project documentation for dry storage investment, technology type and construction on site. Dry storage approach was initiated after the regulatory body's post Fukushima requirement to improve plant safety in the area of spent fuel storage. The decision and approval for plant life extension for additional 20 years was also one of the drivers and prerequisites for such investments. Dry storage for spent fuel is already included in the existing rev.1 Decommissioning and Waste Management Programme. For the last question see response to Question No. 33.

Country	Article	Ref. in National Report
Ukraine	Article 32.1.3	B, (iii) page 14

Question/ In the Program only LILW management is mentioned. The siting and the construction of a repository for short-lived LILW is one of the principal goals of LILW management in Slovenia.

Please give waste acceptance criteria for short-lived LILW disposal.

What is envisaged for long-lived LILW?

Answer WAC for the future LILW repository are under development. Waste that will not meet the WAC for LILW repository should be stored in storage facilities for the solution of ILW and HLW.

Country	Article	Ref. in National Report
Germany	Article 32.1.4	p. 16 (Section B)

Question/ Central Storage Facility in Brinje

Comment The operator ARAO started to revise the safety case for the Central Storage Facility (CSF) in Brinje. According to the report, the process is planned to be finished in 2014.

Has the update of the safety case been completed by now? If so, what are the main results?

Answer Update of the Safety report has not been finished yet. A new revision is foreseen in the middle of 2015.

Country	Article	Ref. in National Report
Ukraine	Article 32.1.4	B, (iii) page 15

Question/ Responsibilities of different parties involved in LILW management are described.

Comment Please clarify who will be the operator of LILW disposal facility.

Answer ARAO is responsible to prepare and file construction permit documentation and obtain construction permit. The foreseen operator of the future LILW repository is ARAO – the national radwaste management organisation.

Country	Article	Ref. in National Report
Germany	Article 32.1.5	p. 109 (Section L: Annexes (i))

Question/ Classification of radioactive waste

Comment The report states that “The volume of Low and Intermediate-Level Solid Radioactive Waste is one of the performance indicators of the Krško NPP”. Unfortunately, the ILW is not characterised in more detail in the report. This should be completed.

In this connection, the sentence “Low-level refers to all radioactive waste that is not spent fuel or a by-product of spent fuel processing” should be harmonised with the given waste classification (see page 20).

Answer Low and intermediate level waste is in the same category - LILW. In whole text under the title “Performance Indicators of the Krško NPP” on page 109 of the report, the wording “Low-Level” should be replaced with the wording “Low and Intermediate Level”.

Country	Article	Ref. in National Report
Ukraine	Article 32.1.5	B, (iv) page 15

Question/ The paragraph describes the ARAO Radioactive Waste Management Programme. Could you specify the key provisions of clearance

Comment procedure, clearance criteria and whether storage for decay is considered as possible option before clearance? What documents should be provided under the procedure of RAW release from the regulatory control?

Answer Clearance procedure is carried out according to Rules on radioactive waste and spent fuel management (Off. Gazette RS, 49/2006), and Decree on activities involving radiation (Off. Gazette RS 48/2004, 9/2006). The decree defined unconditional clearance levels and criteria for conditional clearance. In case clearance is foreseen then the regulatory body can issue the permit for decay and clearance of the radiation source in one document, and clearance is carried out by the licensee for the radiation source. The content of applications is prescribed in the JV2/SV2. The regulatory body has to be informed before the radioactive source is actually released from regulatory control. After clearance, the waste is managed according to the provisions of legislation dealing with waste management in general. In case of conditional clearance a special licence is required. The main document is a plan of handling radioactive substances and a plan of optimisation of human and environment protection against ionising radiation which demonstrates the compliance with the conditions for clearance. After clearance, the material is managed according to the selected scenario. (reuse, disposal, recycling).

Country	Article	Ref. in National Report
Ukraine	Article 32.1.5	B, (iv) page 16-17

Question/ Comment Remediation project for disposal sites for mining and milling waste is described. Only the radon exhalation rate after the completed remediation is mentioned. Is this the only criteria? Please specify the end-state criteria after the remediation of the territory affected by uranium production.

Answer The end-state criteria is not only radon exhalation rate (0.1 Bq/m²/s for "Jazbec" mine waste pile, which is below typical temperature inversion altitude and 0.7 Bq/m²/s for "Boršt" mill tailings site, which is above typical temperature inversion altitude). General dose constraint for nearby population is 0.3 mSv/year. Gamma dose rate on site shall be below 200 nGy/h. Any beta removable contamination above natural background is not allowed. Additionally, liquid emission of uranium and radium from the "Jazbec" mine waste pile into surface and subsurface waters are limited (up to 100 kg of uranium (in U308 form) and 25 MBq of 226Ra per year, while the concentrations are limited to 600 mg/m³ for U308 and 40 Bq/m³ for 226Ra. At the same time the sum of concentrations of 230Th, 210Pb and 210Po is limited to 100 Bq/m³ in any water sample from individual effluents). Liquid emissions of uranium and radium from the former mining pit are limited to 200 kg of uranium (in U308 form) and 50 MBq of 226Ra per year, while the concentrations are limited to 300 mg/m³ and 60 Bq/m³ respectively. There should be no liquid effluents from the "Boršt" mill tailings site, while the concentration of 226Ra in the nearby Boršt creek is limited to 60 Bq/m³, while the total amount of 226Ra should not exceed 50 MBq. All limits have been determined by group of experts for radiological protection according to ALARA optimisation principle.