MONTENEGRO

FOURTH

NATIONAL REPORT ON THE IMPLEMENTATION OF OBLIGATIONS UNDER THE JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

PODGORICA, NOVEMBER 2020

1 Table of Contents

2 Section A: Introduction

Inadequate management of disused radioactive sources, radioactive waste or spent fuel can have consequences on territory of a country or in a cross-border context as well. Therefore, the protection of human life and health, as well as the environment from the harmful effects of ionizing radiation and radioactive waste management, ie radiation and nuclear safety and security are important activities of the Government of Montenegro.

Aware of the importance that the international community attributes to the properly use of nuclear energy for peaceful purposes, and confirming the need to continue to further improve the high level of nuclear and radiation safety and security worldwide, the Parliament of Montenegro, wishing to promote an efficient culture in terms of radiation safety, adopted the Law on the Ratification the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ("Official Gazette of Montenegro – International Treaties", No. 03/10 of 19 March 2010). The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereinafter referred to as: the Joint Convention) entered in force in Montenegro on 27 March 2010. The accession instrument to the Joint Convention was deposited with the International Atomic Energy Agency (IAEA) on 9 August 2010, and in Montenegro it entered in force on 7 November of the same year. No declarations or reservations towards the accession instrument were made. As a fully-fledged member, Montenegro is sending a clear message that only through the strengthening of international cooperation and through the readiness to take part in the process of reporting and reviewing reports of other Contracting Parties, a full contribution can be given to the global framework for the furthering of the nuclear and radiation safety and security.

In order to fulfill the obligations regulated by the Law on Ratification of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, the Government of Montenegro, at its session held on September 22, 2011. adopted the First National Report on the Implementation of Obligations Arising from the Joint Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management, while the Second and Third National Reports on the Implementation of Obligations Arising from the Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management were adopted at the session of the Government of Montenegro held on 2 October 2014 and 5 October 2017 respectively.

Reports, presented at the Fourth, Fifth and Sixth Review Meetings of the Contracting Parties to the Joint Convention held in May 2012, 2015 and 2018 at the at the Headquarters of the International Atomic Energy Agency (IAEA) in Vienna, were prepared by the Ministry of Sustainable Development and Tourism in cooperation with other responsible authorities and institutions.

In the course of the review process of the three previous Reports, Montenegro took active part in asking questions to other Contracting Parties and in preparing answers to questions asked to Montenegro. In relation to that, the Government of Montenegro had discussed and adopted the Answers to questions of the Contracting Parties to the Joint Convention on the First, the Second and the Third National Report on the Implementation of Obligations under the Joint Convention on the Safety of Spent Fuel

Management and on the Safety of Radioactive Waste Management, on 12 April 2012, 16 April 2015 and 19 April 2018 respectively.

The aim of the **Fourth National Report on the Implementation of Obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management** is to demonstrate that Montenegro has been fulfilling its obligations within the framework of the Joint Convention by presenting the achieved progress between the two Review Meetings, as as well as to describe existing and future challenges and plans to overcome them.

The Fourth National Report will be presented at the **Seventh Review Meeting of the Contracting Parties to the Joint Convention** which will take place from 24 May to 4 June 2021 at the International Atomic Energy Agency (IAEA). The Report, discussed and adopted by the Government of Montenegro, was prepared by the Ministry of Sustainable Development and Tourism in cooperation with the Directorate for Emergency Situation of the Ministry of the Interior, the Nature and Environmental Protection Agency, the Administration for Inspection Affairs and the "Centre for Eco-Toxicological Research" LLC.

Benefiting from its status of a fully-fledged member of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Montenegro takes the opportunity to present its status in the area of radioactive waste management and to take part in the constructive dialogue aimed at its further improvements, thus contributing to the global framework of the overall safety improvement.

During the preparation of the Fourth National Report on the Implementation of Obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Montenegro carefully considered the Report of the Chairman and Coordinator of the Sixth Review Meeting of the Contracting Parties, as well as questions raised by Contracting Parties, all with a view to improving the presentation of the implementation of the Joint Convention and the National Report of Montenegro.

3 Section B: Policies and Actions (Practices)

3.1 Article 32 Reporting, paragraph 1

„In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address its:

(i) spent fuel management policy;
(ii) spent fuel management practices;
(iii) radioactive waste management policy;
(iv) radioactive waste management practices;
(v) criteria used to define and categorize radioactive waste.“

3.2 Radioactive Waste Management Policy

Pursuant to the Law on Ionizing Radiation Protection and Radiation Safety (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16), construction of nuclear power plants, plants for production of nuclear fuel and plants for the treatment of used nuclear fuel is banned, as well as any research or activity aimed at development, production and use of nuclear weapons, as well as any use of radioactive or nuclear material for production of weapons of mass destruction.

Provisions of this Law stipulate the prohibition of import of radioactive waste, as well as any processing, storing and disposal of radioactive waste of foreign origin on the territory of Montenegro, any trade in nuclear material on the territory of Montenegro, any installation of radioactive lightning rods on the territory of Montenegro, any installation of ionizing smoke detectors having a source of ionizing radiation in gaseous state or ionizing radiation source whose breakup products are in gaseous state. Also, adding radioactive substances in food, drinking water, medicines, tobacco and tobacco products, toys, jewellery, cosmetics, toiletries, construction material, animal feeds, ores, primary metallic products, mineral raw materials and consumer goods, as well as import, export and marketing of such products is prohibited. In that respect, items (i) and (ii) of Article 32 of the Joint Convention are not relevant for Montenegro.

Pursuant to the ratified Agreement on Safeguards, the Additional Protocol and the Protocol on Small Quantities, Montenegro has reported nuclear materials (source materials), which it does through regular reporting, and has so far hosted three inspections by the International Atomic Energy Agency.

As it has already been pointed out, **there is no spent fuel** on the territory of Montenegro. In addition to the prohibition given by the Law on Ionizing Radiation Protection and Radiation Safety, the Energy Policy of Montenegro until 2030, which was adopted by the Government of Montenegro on 3 March 2011 as well as the the **Energy Development Strategy of Montenegro until 2030** – White Book with the Strategic Environmental Assessment and the Public Debate Report, adopted by the Government of

Montenegro at the session of 10 July 2014, the construction of nuclear power plants, ie installations **is not envisaged**.

In Montenegro there are few practices related to ionizing radiation, which is why the use of radioactive material and ionizing radiation sources is limited to the use in medicine, industry and for training, scientific and research purposes. Total quantities of radioactive waste in Montenegro are very small, given the size of the country that counts not more than 620.029 inhabitants, its small-size industry and the legal obligation to return the disused, high activity radioactive sources to the supplier after the expiry of their exploitation lifetime.

Regardless of a relatively small number of practices and small quantities of stored disused sealed radioactive sources and of radioactive waste, Montenegro is provided with a central facility for the storage of radioactive waste. The Government of Montenegro, that is, the Ministry of Sustainable Development and Tourism is the owner of this storage facility, which is administered, since 13 June 2012, by the Centre for Eco-Toxicological Research Podgorica, on the basis of a license issued by the Nature and Environmental Protection Agency.

The table shows **the overview matrix** of policy status, the overview in the management of disused radioactive sources, radioactive waste and spent fuel in Montenegro:

Type of Liability	Long-Term Management Policy	Funding of Liabilities	Current Practice / Facilities	Planned Facilities
Spent Fuel	Not applicable as Montenegro does not have spent fuel	Not applicable as Montenegro does not have spent fuel	Not applicable as Montenegro does not have spent fuel	None
Nuclear Fuel Cycle Wastes	Not applicable as there is no waste from the nuclear fuel cycle	Not applicable as there is no waste from the nuclear fuel cycle	Not applicable as there is no waste from the nuclear fuel cycle	None
Application Wastes	• Export whenever is possible • Storing in centralised operational storage of radioactive waste facility until disposal option identified	• Centralised facility for storing of radioactive waste established and operational • Fees structured and defined in the 2009 Law (article37 and 38) for use of centralised facility	• Minimisation of RW and DSRS • Conditioning of RW and DSRS • Storage at centralised facility • Prohibited import of radioactive waste of foreign origin	• To develop Analysis of further management of DSRS and RW including disposal options for the development of a future strategic framework
Decommissioning	There is legacy site with parts of jet engines	Funding will be secured by the budget of Montenegro and donors	The first Draft Plan of preparatory activities and practical work has	Dismantling decommission and store radioactive

	that require decommissioning		been prepared	material in the radioactive waste storage facility
Disused Sealed Sources	• Return to manufacturer/supplier • Export if possible • Storing in centralised operational storage of radioactive waste facility until disposal option identified	• According to the Rulebook all holders of licenses to perform radiation activity who have sources of ionising radiation and procure them for own needs from suppliers, or directly from manufacturers, are obliged to also ensure by the agreement on a source procurement the return of the source to its manufacturer. This ensures funds to secure the return of the source to its manufacturer, i.e. the price of the procurement includes the cost of return of the source, which means that holders of licenses to perform radiation activity who have sources of ionising radiation bear the cost of their return. • When it is not possible source will be stored in a central radioactive waste storage facility	• Return to manufacturer/supplier • Storing in a central radioactive waste storage facility	• Return to manufacturer/supplier • Storing in centralised operational storage of radioactive waste facility until disposal option identified

3.3 Development and implementation of a holistic and sustainable strategy for radioactive waste and spent fuel management

The provisions of the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) and the provisions of the Law on the Ratification of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management stipulate the establishment of the policy, i.e. the strategy in the area of radioactive waste management in Montenegro ("Official Gazette of Montenegro – International Treaties", No. 02/10). In order to ensure the conditions for implementation of the policy in the area of ionizing radiation protection, radiation safety and radioactive waste management, the Government of Montenegro, at the session held on 22 September 2011, adopted, at the proposal of the Ministry of Sustainable Development and Tourism, the first ***Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its Implementation (2012-2016)*** *together with two biennial reports on its implementation, on 18 December 2013 and 17 December 2015, respectively.*

According to the 2016 Operational Programme of the Government of Montenegro and the Programme of Accession of Montenegro to the European Union 2016-2018 (PPCG 2016-2018), the Government of Montenegro, at the session held on 29 December 2016, *discussed and adopted*, at the proposal of the Ministry of Sustainable Development and Tourism, the **Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its Implementation for 2017-2021.** The Strategy was prepared based on the analysis of the previous Strategy for 2012-2016, taking in account new requirements of international standards and measures established and clearly described in the *Second Report on the Implementation of the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management* that have not been achieved during the reference period.

The Strategy was developed in cooperation between the Ministry of Sustainable Development and Tourism and the experts of the International Atomic Energy Agency, whereas its review was entrusted to the representatives of the Institute for Radioelements of the Kingdom of Belgium. Special attention during the development of the Strategy was given to **the lessons learned and the experiences gained during the Review Meetings of the Joint Convention** and to the questions asked to Montenegro by the Contracting Parties to the Convention.

To facilitate the review of the status, the concept of this strategic document was made in such way to include, for each of the 25 chapters, the following descriptions: current status and achieved progress, objectives to be achieved through requirements of international standards and the European Union *acquis*, proposals and recommendations that need to be applied to achieve established objectives, through the implementation of precise measures defined in the Action Plan. Therefore, each of the chapters of the Strategy includes the definition of goals, identification of stakeholders, proposal of expected results, timeframe for their achieving, financial reports as well as other preconditions important for implementation of the Strategy (legal and administrative requirements, necessary knowledge and human resources).

The Strategy addresses the following issues: radiation practices performed in Montenegro, status in the area of radiation and nuclear safety and security; current quantities of radioactive waste and disused sealed radioactive sources; possible ways of generation of new radioactive waste on the territory of Montenegro; time frames for decision making in this area as well as technical, financial and human resources necessary to achieve the Strategy goals. The document, particularly the part related to the radioactive waste management, was drawn up consulting the publication of the International Atomic Energy Agency „Policies and Strategies for Radioactive Waste Management“, as well as the provisions of the Council Directive 2011/70/EURATOM establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste and other Acquis Communautaire acts of the European Union.

The adopted national policy for radioactive waste management **is long-term storage management** according to Strategy for protection against ionizing radiation, radiation safety and radioactive waste management for the period 2017-2021 with the Action Plan for the period 2017-2021. However, a policy on radioactive waste disposal has also been introduced. Namely, the Strategy states that "all countries that have a storage facility on their territory in which disused radioactive sources and radioactive waste are located should make a decision on disposal, whether in the country or abroad." In this regard, future activities, which include the preparation of a special Analysis on the further management of disused sealed radioactive sources and radioactive waste, will be extremely important for the development of a future Strategy, which will cover these issues.

In accordance with the provisions of Article 38 of the existing Law on Ionizing Radiation Protection and Radiation Safety, radioactive waste, until the conditions for its disposal are established, will be stored with a legal entity licensed to operate a radioactive waste storage facility, while maintenance costs are provided from the Budget of Montenegro. The costs of transport, safe and secure storage of disused radioactive sources that cannot be returned to the supplier are provided by the owner of these sources. In addition, this amount includes the costs of disposing of that source.

As explained in section 3.2 Radioactive Waste Management Policy, Montenegro has a limited number of radioactive sources in use that are constantly controlled and the radioactive sources are returned to the supplier after use, which is regulated by the Agreement between suppliers and users of these sources. Montenegro has no nuclear facilities and their construction is prohibited by Law. In addition, Montenegro has no spent fuel and does not plan to have it.

Based on documents and licenses issued for operation of the storage (construction, exploitation, license to manage radioactive waste storage) and based on the estimated volumes of generated radioactive waste in Montenegro, it is estimated that the storage for radioactive waste can be operational for **at least 50 years,** as highlighted in the Safety Report, which was one of the conditions for obtaining a permit.

After expiry of this period, depending on the condition and volume of the waste at that time, a decision will be made concerning next steps – methods of handling radioactive waste. **This may be**: extension of the operational lifetime of the existing storage for another 50 years, ie. as long as the building can be stable, safe and secure for those purposes; construction of a new storage facility or construction of a radioactive waste disposal facility with decommissioning of the existing storage facility.

These issues will be addressed in a special document Analysis on the further management of disused sealed radioactive sources and radioactive waste, which, in addition to considering all technical options, should also present a financial statement for each of the options separately. After a thorough Analysis, which will be the basis for the future strategic or program framework on radioactive waste management, a clearer sustainability of radioactive waste management will be achieved. Attention should be paid to issues such as feasibility, capacity, environmental side effects, social factors such as public risk perception, communication and transparency of information, the need for dialogue and consultation of all stakeholders, especially those near which some of the future facility new options will be, if any.

Also, ethical aspects such as those related to planning and cost allocation should be taken into account, as well as the principle regarding dose limitation. It is therefore important that the Analysis proposes practical technical options by which they can be taken into account in the decision-making process, introducing a matrix of stated financial values, to ensure transparent and systematic consideration of values in choosing the future strategic or programmatic framework for radioactive waste management in Montenegro, which would also provide time frames for planned activities. In addition, it is necessary to describe the necessary human capacities, necessary for the implementation of any option, as well as their continuous training.

It should be noted that the half-life of some radioactive material in the radioactive waste storage **exceeds 100 years** (Ra 226-1600 years). Also, for the expected radioactive material thorium (aircraft engine remnants) that will initially be stored in the radioactive waste storage, the half-life exceeds **one billion years**.

In the Strategy, in the section Responsibility of the Government, it is stated:
"The Government is expected to establish and develop a legal framework that ensures the safe disposal of radioactive waste, with clearly defined responsibilities of those: selecting the sites where the disposal will be built, working on the design and construction of the disposal, as well as those who manage the disposal and decide on its closure.This means that at the national level it must first be determined: what type of disposal meets the national needs, disposal development procedures and procedures by which its licensing process is carried out, a clear division of responsibilities of all involved in the disposal development process from the very beginning, ie from the selection of location to the closure, sources of continuous financing that ensures the operation and maintenance of such a facility during its operation and after its closure. "

It is important to point out that the new Proposal Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security **stated and defined in detail all steps in radioactive waste management for the situation in Montenegro, including disposal (licenses, surveillance, decommissioning, etc.)**. Also, it is prescribed that radioactive waste generated in Montenegro may be disposed of in a member state of the European Union or in a state that is not a member state of the European Union, based on an concluded Agreement on the use of radioactive waste disposal in that country.

Guided by the analysis of the results achieved in the previous period and future goals that Montenegro has to achieve, as well as the challenges in the area of ionizing radiation protection, radiation and nuclear safety and security and radioactive waste

management, the Strategy provides, within the framework of the Action Plan, clear strategic guidelines for the fulfilment of established goals. Compared to the first Strategy 2012-2016, the following areas have been included for the first time: education, training and re-training; the license issuing system; inspection supervision; radioactivity monitoring; institutional, administrative and technical capacities; decommissioning of plants using radioactive sources and decommissioning of plants storing radioactive materials used for military activities; safety culture; nuclear security; security culture; naturally occurring radioactive materials NORM; disused radioactive sources management; transport; transboundary movement; decommissioning of radioactive waste storage facility; preparedness and response in emergency cases with a brief overview of the situation in Montenegro after the Fukushima accident in Japan; radioactive waste disposal and research and development.

The development of the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its Implementation for 2017-2021 did not require the drawing up of the Strategic Environmental Assessment, as established by the Ministry of Sustainable Development and Tourism, on the basis of Article 13a paragraph 2 of the Law on Strategic Environmental Assessment ("Official Gazette of the Republic of Montenegro", No. 80/05 and "Official Gazette of Montenegro", No. 73/10, 40/11, 59/11), in the Decision on non-elaboration of the Strategic Environmental Assessment for the Strategy for Ionizing Radiation Protection Radiation Safety and Radioactive Waste Management with the Action Plan for its Implementation for 2017-2021. The reason for this is that the draft Strategy, compared to the Strategy for 2012-2016, does not introduce any new element that would have an important impact on environmental segments, neither are new options or decisions taken in consideration regarding the management of disused sealed radioactive sources and radioactive waste, including radioactive waste disposal, considering that such a decision would require a prior drawing up of the Analysis of further steps for the management of disused sealed radioactive sources and radioactive waste. After having conducted the above mentioned Analysis, the most acceptable options for further management of disused sealed radioactive sources and radioactive waste will be the subject of the new Radioactive Waste Management Program envisaged by theProposal Law, while the Decision on elaboration of the Strategic Environmental Assessment will be made in due time, pursuant to the Law on Strategic Environmental Assessment ("Official Gazette of the Republic of Montenegro", 80/05, "Official Gazette of Montenegro", No. 73/10, 40/11, 09/11, 52/16).

It is foreseen that the **Strategy would be revised**, in order to monitor in a more efficient way the development of radiation activities and the management of disused sealed radioactive sources and radioactive waste in Montenegro, the implementation of which will be regularly notified to the Government of Montenegro by the Ministry of Sustainable Development and Tourism **every two years**.

It is important to underline that the drafting of the Strategy 2017-2021 was subject to a very constructive forty-day long Public debate which resulted in the drawing up of the corresponding Report. During the public debate, a series of intersectoral consultations were held with the purpose of harmonization of received comments, opinions, remarks and suggestions.

Guidelines for the implementation of the Strategy were presented in the Action Plan within the framework of 52 implementation measures. Out of 52 measures, 15 of them

require financial resources in the amount of 869.000 Euro for the overall period of five years.

The Government of Montenegro at the session held on 29 December 2016 by Conclusion No. 08 - 3371 from 12 January 2017, instructed the Ministry of Sustainable Development and Tourism to report biennially the Government of Montenegro on the level of implementation of the Action Plan for the period 2017-2021. In this regard, the Government of Montenegro at the session held on 26 December 2019 considered and adopted the First Report on the implementation of measures of the Action Plan for the period 2017-2018 of the Strategy for Protection Against Ionizing Radiation, Radiation Safety and Radioactive Waste Management for the period 2017-2021.

The First report on the level of implementation of the Action Plan for the period 2017-2021 refers to the period **January 2017 - December 2018** and was prepared by the Ministry of Sustainable Development and Tourism in cooperation with, for this area, relevant institutions, with which in direct cooperation it determined the level of implementation of measures from the Action Plan. The First report provides an overview and assessment of the achieved progress in: legal and institutional framework, strengthening of administrative capacities, concrete implementation activities, international cooperation, technical cooperation projects, etc.

Full implementation of activities envisaged by the Action Plan for the period 2017-2021, will ensure the improvement of the quality of ionizing radiation application, as well as the improvement of radiation and nuclear safety and security, both from a preventive and operational view, and from the point of view of eliminating the consequences of inadequate use of ionizing radiation sources and inadequate application of measures related to radiation and nuclear safety and security.

During the implementation of activities planned by this strategic document, a number of challenges were encountered that were overcome, but this resulted in a shift in the implementation of a number of activities for the next period. This primarily refers to the biggest challenge related to the drafting of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, for which an earlier implementation deadline was set, but the complexity of the matter required an extension of that deadline. It is a very complex substantive Law that needed to be harmonized with the existing Acquis Communautaire, ratified international legal instruments, standards and guidelines of the International Atomic Energy Agency and the International Commission on Radiological Protection, which in the period since the adoption of the existing Law, ie since 2009, has changed significantly since today, which was the reason for the adoption of the new Law, which will be discussed in more detail in Section **E: Legislative and regulatory framework.**

The Parliament of Montenegro is currently considering a new legal framework, ie the **Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security**, which improves the existing legal framework in this area and harmonise with the standards of the International Atomic Energy Agency and the Acquis Communautaire. With regard to the data (i) and (ii) of Article 32 of the Convention, this Proposal of the Law for the first time **regulates the authorization of export and transit of radioactive waste and transit of spent fuel**, while, inter alia, the import, processing, storage, disposal of radioactive waste and spent fuel of foreign origin on the territory of Montenegro **is prohibited.** In addition, the Proposal of the Law **does not**

apply to spent fuel management and export of spent fuel because Montenegro does not have it.

The Proposal of the Law regulates in detail the conditions for radioactive waste management that apply to radioactive waste from its generation to disposal. Special attention was paid to the decommissioning of legacy sites (inherited) with radioactive material and the manner of providing subsidies for the implementation of decommissioning by the Government of Montenegro.

The part relating to transboundary shipments of radioactive waste and/or spent fuel regulates the conditions for cross-border shipments, ie the conditions for export or transit of radioactive waste or transit of spent fuel, for which approvals are issued on the prescribed standardized form, according to which all participants in the shipment behave. It also regulates the procedure in case of a failed shipment, the manner of obtaining consent and exchange of information between the countries participating in the shipment, as well as the manner of reporting to the European Commission on shipments.

In addition to the above, for the first time within the new proposed legal framework the import, export, transit and use of nuclear materials are allowed under the conditions that accompany the appropriate licences.

Detailed reporting on the legal framework of this area, which represents the progress achieved between two Review meetings, will be done at the upcoming Review Meeting of the Parties to the Joint Convention, as it is by then expected that the Law will be adopted by Montenegrin Parliament.

3.3 Radioactive Waste Management Procedures

The Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) stipulates the requirements for radiation practices in Montenegro and for the protection of human life and health and of the environment against the harmful impact of ionizing radiation. Radioactive waste in Montenegro is mostly generated by the use of radioactive sources for medical and industrial purposes, as well as for education, science and research purposes. The following radiation practices are currently conducted in Montenegro:

(1) Medical practices:

a) dental X-ray diagnostics;
b) diagnostic and intervention radiology;
c) radiotherapy;
d) brachytherapy;
e) nuclear medicine (diagnostics);
f) veterinary X-ray diagnostics.

(2) Non-medical practices:

a) non-destructive tests – radiographic tests (industrial radiography);
b) measurements by portable gauges, detection or analytical techniques (thickness, density, level, humidity etc.);
c) measurements with stationary gauges, detection or analytical techniques (thickness, density, level, humidity etc.);
d) radioactive waste management;
e) trade (import; export, transit) and transport of ionizing radiation sources and radioactive materials.

As one of the possibilities, introduction of radiation practices – nuclear medicine (therapy) will be taken in consideration.

In this chapter, Montenegro takes the opportunity to give a description of the current status in terms of the management not only of radioactive waste, but also of disused sealed radioactive sources and radioactive material generated during the performance of the above mentioned practices.

Montenegro has **only one department of nuclear medicine** (use of 99mTc for diagnostic purposes), **one department of radiotherapy** (linear accelerator), **including brachytherapy** (Ir 192). Having in mind the application and structure of sources in Montenegro, most of the disused sealed radioactive sources and radioactive waste in Montenegro are radioactive lightning rods and smoke detectors with radioactive isotope. Despite the relatively low activities and the small amount of disused sealed radioactive sources and radioactive waste, the issue of management of disused sealed radioactive sources and radioactive waste in Montenegro is being resolved in a good way, in accordance with international standards.

The *Law on Ionising Radiation Protection and Radiation Safety* defines radioactive waste as radioactive material not intended for further use. The Law defines high-level waste as the radioactive material of high levels of activity, but fails to specify the low and intermediate level waste (LLW/ILW), or long and short lived LLW/ILW, but it gives the legal ground for the development of relevant secondary legislation (Article 37) to be defined in accordance with the radioactive waste classification proposed by *the* IAEA (*General Safety Guide GSG-1* http://www.iaea.org/Publications/Standards/index.html). Pursuant to the Law on Ionising Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) the following implementing legislation was adopted:

- **Rulebook on detailed conditions for obtaining the license for radioactive waste storage management** ("Official Gazette of Montenegro", No. 56/11 of 25 November 2011);
- **Rulebook on the method of collecting, keeping, processing and storing radioactive waste** ("Official Gazette of Montenegro", No. 58/11 of 6 December 2011).

Adoption of the Rulebook on detailed conditions for obtaining the license for radioactive waste storage management and the Rulebook on the method of collecting, keeping, processing and storing radioactive waste, regulated a **new classification of radioactive waste** in accordance with the latest IAEA standards, **clereance level, exemption level, discharge, waste acceptance criteria of radioactive waste, etc.** In that way, all preconditions for safe and secure management of radioactive waste and disused sealed radioactive sources have been created.

In addition to the above, the classification of radioactive waste is listed in the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its implementation (2012-2016) and the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for 2017-2021 with the Action Plan for the period 2017-2021.

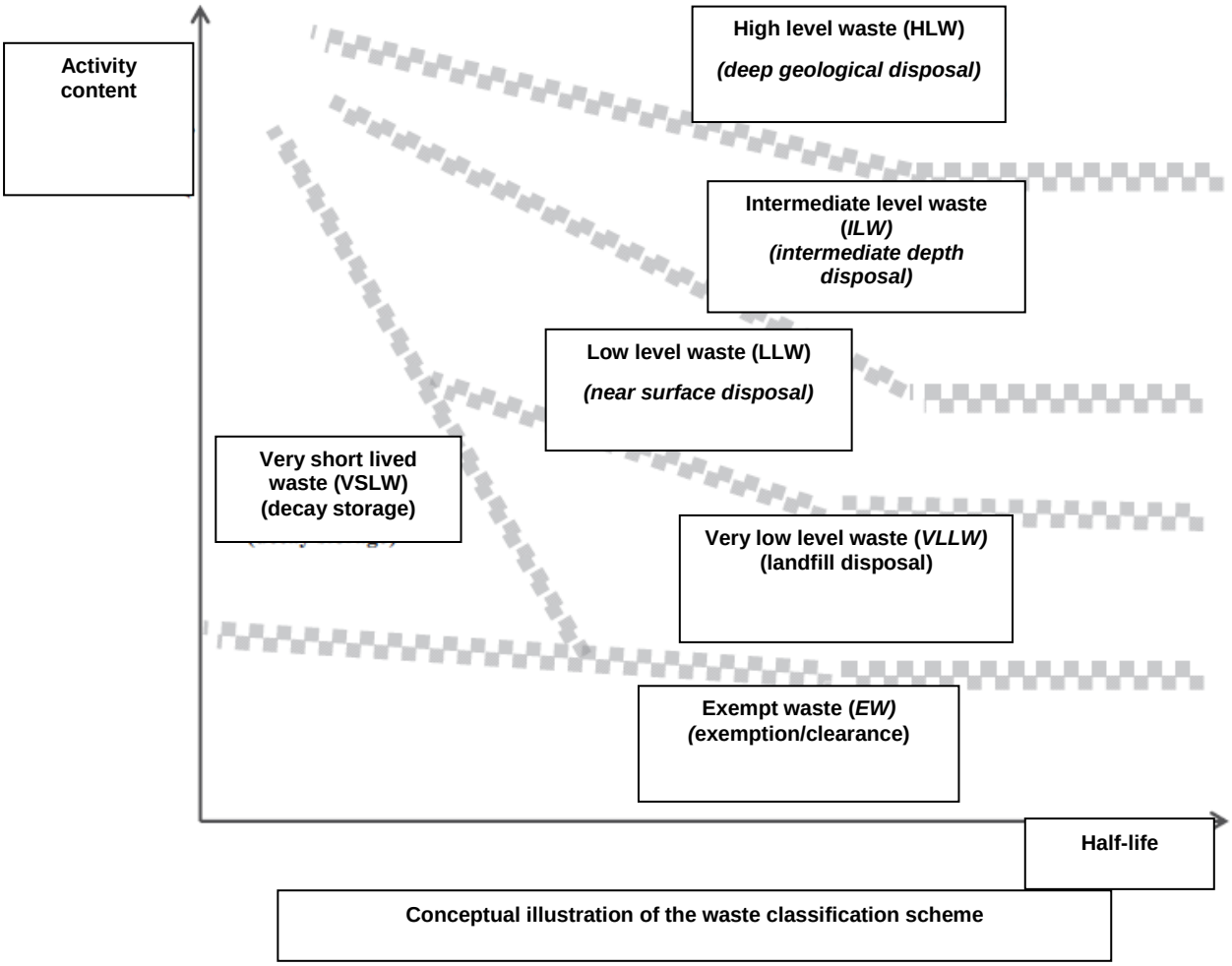
The Rulebook on the method of collecting, keeping, processing and storing radioactive waste governs, inter alia, the classification of waste in line with the IAEA document GSG-1. Provisions of Article 4 of the said Rulebook envisage that radioactive waste is collected, kept, recorded, processed, stored and disposed of according to the type and classification, as well as that according to its physical state, radioactive waste is divided into: solid, liquid and gaseous.

According to the level and type of radioactivity, radioactive waste is classified into exempted waste (EW), very short lived waste (VSLW), very low level waste (VLLW), low level waste (LLW), intermediate level waste (ILW) and high level waste (HLW) in line with the table below, and the graph 1:

Table 1: Classification of radioactive waste

Radioactive waste	Typical features and disposal methods
Exempted waste (EW)	Waste whose specific activity or total activity is equal to or lower than the limit values set in Appendix 3 to the present Rulebook on the method of collecting, keeping, processing and storing radioactive waste ("Official Gazette of Montenegro", No. 58/11 of 6 December 2011).
Very short lived waste (VSLW)	Waste that can be stored for decay over a limited period of up to a few years and subsequently cleared from regulatory control according to arrangements approved by the regulatory body, for uncontrolled disposal, use or discharge. This class includes waste containing primarily radionuclides with very short half-lives often used for research and medical purposes.
Very low level waste (VLLW)	Waste that does not necessarily meet the criteria of EW, but that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near surface landfill type facilities with limited regulatory control. Such landfill type facilities may also contain other hazardous waste. Typical waste in this class includes soil and rubble with low levels of activity concentration. Concentrations of longer lived radionuclides in VLLW are generally very limited.
Low level waste (LLW)	Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred

	years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration (specific activity), and also long lived radionuclides, but only at relatively low levels of activity concentration (specific activity).
Intermediate level waste (ILW)	Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its storage and disposal. ILW may contain long lived radionuclides, in particular, alpha emitting radionuclides that will not decay to a level of activity concentration (specific activity) acceptable for near surface disposal during the time for which institutional controls can be relied upon. Waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.
High level waste (HLW)	Waste with levels of activity concentration (specific activity) high enough to generate significant quantities of heat by the radioactive decay process or waste with large amounts of long lived radionuclides that need to be considered in the design of a disposal facility for such waste. Disposal in deep, stable geological formations usually several hundred metres or more below the surface is the generally recognized option for disposal of HLW.



Shema 1

It is important to underline **that liquid radioactive waste does not exist in Montenegro**, however there is always the likelihood that any sealed radioactive source in contact with water can generate liquid waste. In the event that liquid radioactive waste is generated in Montenegro in any way, the holder of a license for radioactive waste storage management is obliged in cooperation with the Ministry of Sustainable Development and Tourism to define a Plan for converting such waste into solid waste outside the borders of Montenegro. Only the solid waste that meets the acceptance criteria for the storage facility may be stored.

It is important to remind that all disused sealed radioactive sources previously stored in 18 temporary facilities, as well as radioactive lightning rods that have been installed on the territory of Montenegro, and produced in the former republics of SFRY, were dismantled removed, collected, transported and safely placed and stored in the radioactive waste storage facility, after which their conditioning was performed. These activities were carried out with the support of the International Atomic Energy Agency and the European Commission. Montenegro has, therefore, received support for the implementation of several projects dealing with various aspects of radioactive waste management (medical waste and sealed radioactive sources, monitoring of radioactivity, removal of radioactive lightning rods, prevention of illicit traficking in nuclear and other radioactive material and strengthening the legal framework). The establishment of a

radioactive waste inventory and the establishment of conditions for the operation of a radioactive waste storage facility is also supported by the international community.

A description of the activities carried out by Montenegro, ie the competent institutions for the management of disused sealed radioactive sources and radioactive waste is given in **Section J: Disused sealed sources.**

What is still an ongoing challenge in the process of radioactive material management is the management of contaminated radioactive material, ie aircraft engine debris, some parts of which, among other things, are reinforced with special materials whose chemical components includes thorium radionuclide (232Th) up to 4.7%. Contaminated material is safely and securely stored in the temporary storage facility located on the property of the state company JSC "13. Jul Plantaže" in Podgorica, in accordance with international standards, of which the Ministry of Sustainable Development and Tourism informed the International Atomic Energy Agency, European Commission, the Montenegrin public and the Contracting Parties to the Joint Convention in previous national Reports. In the previous period activities in resolving this issue have been launched. In relation to that, this issue has been also stressed in the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management 2017-2021 with the Action Plan for its Implementation for 2017-2021, and also a solution for this issue was proposed within the measure 38 of the Action Plan to the above mentioned Strategy, in which the issue of management of radioactive material, which is in the possession of JSC "13. Jul Plantaže", was emphasized, including decommissioning. Namely, radioactive waste should be safely stored in the radioactive waste storage facility and the temporary facility should be decommissioned. Decommissioning of this temporary facility requires the drawing up of the Decommissioning Plan, planning of the temporary facility decommissioning and ensuring necessary financial resources for its implementation (execution). The Ministry of Sustainable Development and Tourism, Nature and Environmental Protection Agency and JSC „13 Jul Plantaže“, on whose property the temporary facility is situated, should ensure financial resources and, within the framework of a special project, to dismantle parts of aircraft engines, carry out the conditioning by separating radioactive parts (plates made of magnesium and thorium) from nonradioactive ones, store radioactive material in the radioactive waste storage facility, carry out decontamination of the space and shut the facility down. In this regard, the Ministry of Sustainable Development and Tourism, which is in charge of creation and implementation of radioactive waste management policy and strategy, has asked the International Atomic Energy Agency for expert advisory support in the form of an expert mission which was carried out in period 6-10 November 2017 as part of IAEA regional project. The mission has been dedicated to advising on the development of decommissioning plans for both the temporary facility (storage) and the central radioactive waste storage facility.

Montenegro has developed an Action Plan which now needs to be implemented with financial support. Thus, continuous work is being done to find a way to manage the contaminated radioactive material, which is locazed in temporary storage on the property of JSC "13 Jul Plantaže", performed in the prescribed manner, all in order to ensure the protection of human health and the environment from the harmful effects of ionizing radiation.

The number of positively evaluated inspections of radioactive waste storage facility, the amount of additionally conditioned disused radioactive sources already stored in the radioactive waste storage facility, as well as the amount of new radioactive waste stored

in the radioactive waste storage facility are **clear performance indicators** of radioactive waste management and management of disused radioactive sources in Montenegro.

Until the establishment of electronic portal monitors, Montenegro manually controls shipments of radioactive materials, metals and other goods on radioactivity through its border crossings, whether for export, import or transit. Thus, radioactivity control with mobile devices is performed at the prescribed cross border points, which is in more detail explained in **Section J: Disused Sealed Sources.**

4 Section C: Scope of Application

4.1 Article 3: Scope of Application

„This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.

This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.

This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Parties. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military of defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.

This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.“

This Report does not address the safety of spent fuel management because Montenegro does not have any nuclear facilities neither did it ever have any facility of this category operating or existing on its territory. This means that **there is no spent fuel in Montenegro.**

Montenegro does not have any waste containing only naturally occurring radioactive material (NORM) resulting from the nuclear fuel cycle.

However, Montenegro takes this opportunity in the Fourth Report to inform the Contracting Parties to the Joint Convention that, compared to the previous Strategy for 2012-2016, where the issue of NORM was not addressed, the new Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for 2017-2021 with the Action Plan for 2017-2021 defines clearly and, for the first time, strategically, the method of their management, within the sub-section 22.1.2 Naturally Occurring Radioactive Materials (NORM).

As far as the legal framework is concerned, the provisions of Article 31 of the Law on Ionizing Radiation Protection and Radiation Safety (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16) stipulate that a legal person or an entrepreneur, while performing technical-technological procedures of production bring to an increase of concentrations of naturally occurring radionuclides above the prescribed limits, has the

obligation to keep the record thereof and to submit it to the Nature and Environmental Protection Agency once a year.

The Nature and Environmental Protection Agency, based on submitted evidence, shall establish the degree of damage incurred to human health and life and to the environment and order the application of additional ionizing radiation protection measures. Also, the Rulebook on the limits of radioactive contamination of the environment and decontamination procedures ("Official Gazette of the FRY", No. 9/99) defines the limits of radionuclide content in construction materials and construction materials containing NORM, i.e. whose production uses NORM as one of the building components.

In the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its Implementation for 2017-2021, the provisions of the European Union Directives and standards of the International Atomic Energy Agency are identified as goals to be attained over the reference period of five years. In relation to that, the Strategy underlines the obligation stemming from the Council Directive 59/2013 regarding the identification of types of industrial activities likely to involve the production of naturally-occurring radioactive material and to take in account the protection of workers and the general public against ionizing radiation arising from NORM. The same recommendation was given in the Standard GSR Part 3 – Radiation Protection and Safety of Radiation Sources – International Basic Safety Standards of the IAEA.

Also, the Annex VI of the Directive 59/2013 gives a clear definition of all industrial sectors involving naturally occurring radioactive materials, including research and relevant secondary processes. Only few of these mentioned are relevant for Montenegro: hydrocarbon (oil and gas) production, primary iron production and energy production in thermal power plant.

Furthermore, the Strategy stipulates that all activities in Montenegro resulting in the production of NORM should be adequately addressed from the regulatory point of view, which means that a legal entity performing such activities should carry out the environmental monitoring before, during and after performing the activity, as well as monitoring of generated NORM and inform thereof the Nature and Environmental Protection Agency. The need for personal dosimetry of workers is estimated on the basis of activities of the generated NORM. Adequate protection of the general public against the impact of NORM should be carried out depending on the results of the above mentioned monitoring. Guided by these guidelines given in the Strategy, these issues are regulated in detail in the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security.

It is important to underline that the Government of Montenegro, through the Ministry of Sustainable Development and Tourism, in cooperation with the World Bank (WB) is implementing the "Industrial Waste Management and Clean-up Project". The Project includes the rehabilitation of four (4) priority industrial waste landfills in Montenegro, as well as the identification of the most suitable site for building the national hazardous waste landfill. Four priority sites are: Aluminium Factory Podgorica, Shipyard Bijela, flotation tailing ponds Gradac in Pljevlja and ash landfill of the Pljevlja TPP. The Loan Agreement between the Government of Montenegro and the World Bank for implementation of this project, with the total value of 50 million Euro, was signed in October 2014. Rehabilitation activities are underway at three of the four mentioned locations: Bijela Shipyard, flotation tailing ponds Gradac in Pljevlja and ash landfill of the Pljevlja TPP.

5 Section D: Registers and Lists

5.1 Article 32: Reporting, paragraph 2

„This report shall also include:

(i) a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;

(ii) an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;

(iii) a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;

(iv) an inventory of radioactive waste that is subject to this Convention that:

(a) is being held in storage at radioactive waste management and nuclear fuel cycle facilities;

(b) has been disposed of; or

(c) has resulted from past practices.

This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;

(v) a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.“

Since Montenegro has neither nuclear facilities generating nuclear power nor research reactors or radioisotope reactors, therefore it has no spent fuel facilities for storage or disposal of spent fuel subject to the Joint Convention, provisions of **Article 32 paragraph 2 items (i) and (ii) of the Joint Convention related to the reporting, do not apply to Montenegro.**

Provisions of this Article given in items (iii), (iv) and (v) are relevant for Montenegro. Namely, provisions of Article 7 of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16) stipulate that the Nature and Environmental Protection Agency is one of the four competent institutions that perform expert and related administrative tasks in the area of ionizing radiation protection and radiation safety, and that is, among other things, competent for establishing and maintaining the database (the central register) of ionizing radiation sources, users of such sources, radioactive materials, professionally exposed workers and radioactive waste. In order to improve its work in the part related to the central register, the Nature and Environmental Protection Agency received a donation in the form of the Regulatory Authority Information System RAIS, through the national project *„Support to the Development of Regulatory Infrastructure – phase I“* within the framework of the technical cooperation with IAEA. The central source register contains all available source data: device type, isotope type, source activity (given or estimated on the specified date), source serial number (if available), source owner and location where the source is used. Also, records on occupationally exposed persons and radiation protection officers (RPO) are kept.

Medical uses of ionizing radiation in Montenegro include: about 300 medical radiation sources including dental X-ray units; CTs, 15 screen-film, 2 CR and 1DBT mammography systems (the procurement procedure of three new DBT systems is in progress); 2 digital angiography systems; 1 bone density system; mobile X-rays; 1 digital C-arm for operational room; 1 radiotherapy department with 3 LINACs: Siemens Ocor, Varian True Beam and Varian Halcyon, and 24slice Siemens CT for treatment planning; 1 nuclear medicine department with Gamma camera and SPECT CT.

Industrial and research uses include: several sources used in mining (bauxite, coal, etc.) and metal processing (steel and aluminium smelters).

Montenegro also has TSO JSC Institute for Ferrous Metallurgy from Nikšić which is authorised and provides service of industrial radiography. Namely, the strongest radioactive source in Montenegro is used in industrial radiography, a high-activity radioactive source of category 2 selenium Se-75, whose activity on 22 June 22 2017 was 3.33TBq (90Ci). The source is supplied by the Vinca Institute of Nuclear Sciences - Belgrade, which takes back the disused radioactive source. In addition, in Montenegro, another high-activity radioactive source of iridium Ir 192 is used in medicine (brachytherapy), which is returned to the supplier after expiration. Table 1 shows sealed radioactive sources which are in use in Montenegro:

Table 1: Inventory of sealed radioactive sources which are in use in Montenegro

Radionuclide	Number of sources	Total Activity (GBq)
Eu – 152	2	0.0007
Co - 60	3	0.0008
Am - 241	7	14.253
Cs - 137	7	1.41
Sr - 90	2	0.066
Ni - 63	10	4.4
Ir -192	1	445
Se - 75	1	3700
Y - 88	1	0.0006
Total	**34**	**4165.13**

The Nature and Environmental Protection Agency, as one of the important players in the process of radioactive waste management, has been continuously working on making the radioactive waste inventory. Moreover, there has been a continuous updating of the data on disused sealed radioactive sources and radioactive sources that are in use. As stated, the Agency keeps records of occupationally exposed persons and radition protection officers (RPOs). Table 2 shows the database of occupationally exposed persons.

Table 2: The database of occupationally exposed persons

OCCUPATIONALLY EXPOSED PERSONS	
CATEGORY A	**102**
CATEGORY B	**544**
TOTAL	**646**

The Ministry of Sustainable Development and Tourism and the Nature and Environmental Protection Agency keep the database on declared nuclear materials.

In Montenegro there is a **central radioactive waste storage facility** managed by the LLC "Centre for Eco-Toxicological Research" – Podgorica. Holders of the licence for performing radiation activities temporarily store disused sealed radioactive sources and radioactive waste generated in the course of their radiation activity in their temporary facilities until their transportation to the radioactive waste central storage facility. The Rulebook on the method of collecting, keeping, processing and storing radioactive waste ("Official Gazette of Montenegro", No. 58/11) stipulates the manner in which radioactive waste and DSRS are collected, kept, processed, registered and stored. Among other things, it stipulates that radioactive waste records are to be kept in electronic form for each year separately, on the form prescribed by the Rulebook. The Rulebook also stipulates that the records are to be kept for each package separately and should include the data on fulfilment of acceptance criteria for the reception of radioactive waste in the storage facility. All data in the radioactive waste records are permanently kept.

Protection of data on sources of ionising radiation and radioactive waste from computer viruses (cybercrime) is ensured by applying of the Information Security Law ("Official Gazette of Montenegro", No. 14/10, 040/16) and through coordination by the Government Cyber Incident Response Team (CIRT). Strategic guidelines are provided within the Cyber Security Strategy of Montenegro for the period 2018-2021, which was adopted by the Government of Montenegro on 21 December 2017.

Due to continuous increase of the number of services that public and private sectors provide online, both to citizens and to other legal entities, safe cyber space of Montenegro is becoming one of national priorities. There is no doubt that cyber security constitutes a challenge of modern time and, as such, has not bypassed Montenegro either.

The Parliament of Montenegro has adopted the Law on Changes and Amendments to the Information Security Law ("Official Gazette of Montenegro", No. 14/10, 040/16) which envisages two key activities: establishment of the Information Security Council and protection of information infrastructure, which are in line with the NIS Directive (2016/1148), and after which the Information Security Council was established on 8 June 2017 within accompanying Action Plan for implementation of the Strategy.

In addition, the Analysis of Reports on Incident Situations in Montenegro, which is prepared by the Government Cyber Incident Response Team (CIRT) annually, noted a growing trend in the number of reported incidents year after year, as well as increasingly sophisticated attacks.

5.1.1 Types and Quantities of Radioactive Waste and Disused Sealed Radioactive Sources and Quantities of Expected Radioactive Waste

The following Table presents types and quantities of radioactive waste and disused sealed radioactive sources:

No.	Type of radioactive waste /disused radioactive source	Radionuclide	Number of pieces of radiation sources	Activity per unit(GBq)	Total activity(GBq)
1.	Radioactive lightning rods	$Eu^{152/154}$	66	(0.55 – 2.69)	110.98
		Co^{60}	4	(0.005 – 0.051)	0.094
		Am^{241}	3	3.80	11.40
2.	Radioactive smoke detectors	Am^{241}	475	(0.074 – 2.70) x 10 E-03	1.18
3.	Industrial sources	Cs^{137}	2	8.60	17.20
		Cs^{137}	4	2.61 x 10 E-03	0.01
		Sr^{90}	5	-	-
		Am^{241}	2	0.37	0.74
		Cs^{137}	1	0.74	0.74
		Am^{241}	1	11.10	11.10
		Ni^{63}	1	0.555	0.555
4.	Sources used in science and research	Cs^{137}	1	6.25	6.25
		Cs^{137}	1	0.000003	0.000003
		Co^{60}	1	0.000001	0.000001
		Ra^{226}	1	0.0001	0.0001
		Co^{60}	1	0.00042	0.00042
		Am^{241}	1	-	-
		Ra^{226}	1	0.00004	0.00004
		Cs^{137}	1	0.00011	0.00011
		Co^{60}	1	0.00000087	0.00000087
		Ra^{226}	1	0.0000027	0.0000027
5.	Sources used in medicine	Ir^{192}	1	93.24	93.24
6.	Ministry of the Interior of Montenegro	Cs^{137}	2	0.000037	0.000074
		Sr^{90}	1	-	-
		Ni^{63}	4	0.37	1.48
		H^{3}	2	18.56	37.12
		Ni^{63}	2	0.74	1.48
		Ra^{226}	10	0.00004	0.0004
7.	Army of Montenegro	Ra^{226}	7127	0.00004	0.286
		Ra^{226}	2	-	-
		Sr^{90}	1269	-	-
8.	Customs Administration	Cs^{137}	1	0.0000009	0.0000009
9.	Control of Scrap Metal/ miscellaneous	Ra^{226}	77	-	-

Note: Nuclear materials are not included in the Table.

High activity sealed radioactive sources are returned after their use to the manufacturer as disused radioactive sources, other than smoke detectors with radioactive sources there. This means that there are no other radioactive sources that could generate radioactive waste, so that **it is not expected that significant quantities of radioactive waste would be generated in future**. However, it is important to take in account potentially illegal trade in radioactive and nuclear materials, appearance of sources of unknown owners (orphan sources), as well as incident and accident situations likely to generate radioactive waste.

A radioactive waste storage facility is intended for the storage of solid radioactive waste from industry, medicine or research activities. Only solid radioactive waste that meets the acceptance criteria for a radioactive waste storage facility can be stored. This measure is also contained in the Action Plan of the Strategy for the period 2017-2021. The radioactive waste storage facility is not intended for the storage of liquid radioactive waste, nor for the waste that could be a product of nuclear energy production. In general, Montenegro does not have or has ever had in its history facilities that could be classified as "nuclear", so the number and type of radioactive waste are limited. On the other hand, all known radioactive waste and disused radioactive sources have been removed from the territory of Montenegro and stored in accordance with national regulations and principles of the International Atomic Energy Agency (IAEA). The conditioning process was supervised by the IAEA, which provided expert support to Montenegro in this area.

Previously, in this Report is reviewed the (non) existence of liquid radioactive waste in Montenegro.

As far as the historical radioactive waste is concerned, special focus in this Report is given to addressing the issue of radioactive material management contained in aircraft engines, located in a temporary storage facility on the property JSC "13. Jul Plantaže“ (Figures 1 and 2).

Figure 1

Figure 2

More details on this issue are provided in **Section B, subchapter 3.3 Radioactive Waste Management Procedures.** Montenegro expects donor support to address and resolve this issue. In addition, this issue as well as decommissioning and similar potential locations that may arise are standardized within the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security.

6 Section E: Legislative and Regulatory Framework

6.1 Articles 18-19

Article 18 Implementing Measures

„Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.“

Article 19 Legislative and Regulatory Framework

„Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.

This legislative and regulatory framework shall provide for:

(i) the establishment of applicable national safety requirements and regulations for radiation safety;

(ii) a system of licensing of spent fuel and radioactive waste management activities;

(iii) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a license;

(iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;

(v) the enforcement of applicable regulations and of the terms of licenses;

(vi) a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.

When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.“

The area of ionizing radiation protection, radiation and nuclear safety and security is normatively regulated by the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16). The Law on Ionizing Radiation Protection and Radiation Safety stipulates the protection of human life, health and the environment from harmful effects of ionizing radiation, performance of radiation activities, trade in ionizing radiation sources and radioactive materials, radioactive waste management, actions taken in the event of radiation accident, as well as other issues relevant for ionizing radiation protection and radiation safety. The law prohibits the construction of nuclear power plants, nuclear fuel production plants and spent nuclear fuel treatment plants, as well as the import, use and possession of radioactive sources that will end their life as high activity radioactive waste. Also, the Law prohibits research and other activities for the use of nuclear weapons, import of radioactive waste of foreign origin, installation of new radioactive lightning rods, installation of smoke detectors that have a source of ionizing radiation in the gaseous state or a source of ionizing radiation whose decay product is in the gaseous state and adding radioactive materials in food and other products. The Law also defines the basic principles for the performance of radiation activities: justification of application,

optimization of ionizing radiation protection and limitation of individual exposures. The Law defines the need for the adoption of the Strategy on Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its implementation (Article 6), defines the competencies of the Nature and Environmental Protection Agency, determines measures for ionizing radiation protection and defines monitoring of radioactivity, reporting, required measurements, as well as exposure limits, working conditions for occupationally exposed persons, persons in education and research work and additional training programs. The Law defines a special chapter on the conditions for performing activities, keeping records, quality control and decontamination.

The Law on Ionizing Radiation Protection and Radiation Safety serves as the basis for implementation of seventeen (17) secondary legislation documents (regulations) in Montenegro (the majority of regulations in this area date back in the period of FRY and they are still in force until the adoption of new ones, which is planned according to the dynamics of the development of regulations and harmonization with the European Union *acquis* within the negotiating process for Chapter 15 – Energy, i.e. until the integration of Montenegro with the European Union). Of particular importance is secondary legislation related to radiation protection of the general public and professionally exposed workers, radiation protection in medicine, safe transport of radioactive materials, radioactive waste management etc. The list of secondary legislation is given in the Annex 1.

The following Laws include provisions addressing the issue of transport, trade in radioactive materials and radioactivity monitoring: Criminal Code of Montenegro ("Official Gazette of the Republic of Montenegro", No. 70/03, 13/04, 47/06, "Official Gazette of Montenegro", No. 40/08, 25/10, 73/10, 32/11, 64/11, 40/13, 56/13, 14/15, 42/15, 58/15, 044/17, 049/18), Law on International Legal Assistance in Criminal Matters ("Official Gazette of Montenegro", No. 4/08, 36/13), Law on Inspection Supervision ("Official Gazette of the Republic of Montenegro", No. 39/03, "Official Gazette of Montenegro", No. 76/09, 57/11, 18/14, 11/15, 52/16), Law on Transport of Dangerous Goods ("Official Gazette of Montenegro", No. 33/14, 013/18), Law on Foreign Trade ("Official Gazette of the Republic of Montenegro", No. 28/04, 37/07, "Official Gazette of Montenegro", No. 73/10, 1/14, 14/14, 57/14), Law on Control of Export of Dual-use Items ("Official Gazette of Montenegro", No. 30/12), Law on Foreign Trade in Weapons and Military Equipment ("Official Gazette of Montenegro", No. 40/16), Law on Food Safety ("Official Gazette of Montenegro", No. 57/15), Law on the Environment ("Official Gazette of Montenegro", No. 52/16) and the Decision on the checklist for export and import of goods ("Official Gazette of Montenegro", No. 22/14, 38/15, 29/16, 062/16, 024/17, 035/18, 022/19).

From the aspect of regulations, ie. national legislation that enable the implementation of the Joint Convention, in addition to the provisions of mentioned legal acts, provisions of the following legal acts are also important: the Environmental Impact Assessment Law ("Official Gazette of Montenegro", No. 075/018), Decree on Projects Subject to Environmental Impact Assessment ("Official Gazette of the Republic of Montenegro", No. 020/07, "Official Gazette of Montenegro", No. 047/13, 053/14, 037/18) and the Law on Strategic Environmental Assessment ("Official Gazette of the Republic of Montenegro", No. 020/07, "Official Gazette of Montenegro", No. 047/13, 053/14, 037/18). Particularly important are provisions of the Law on Ratification of the Convention on Environmental Impact Assessment in a Transboundary Context ("Official Gazette of Montenegro - International Treaties" , No. 008/08), the Law on Promulgating the Law on Ratification of the Protocol on Strategic Environmental Impact Assessment in a Transboundary Context ("Official Gazette of Montenegro - International Treaties", No. 002/09) and the

Law on Ratification of the Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters ("Official Gazette of Montenegro - International Treaties", No. 003/09).

As the umbrella law in the area of the environment, the Parliament of Montenegro adopted the Law on the Environment ("Official Gazette of Montenegro", No. 052/16), which, among other things, regulates the environmental monitoring which ensures a continuous control and monitoring of the environment in accordance with this Law and with other specific laws, such as the Law on Ionizing Radiation Protection and Radiation Safety, which, among other things, regulates the radioactivity monitoring programme.

In the area of ionizing radiation protection, it is important to highlight the Law on Food Safety ("Official Gazette of Montenegro", No. 57/15), which establishes conditions for the safety of food and feeding stuff for animals, obligations and responsibilities of entities regarding operations with food and feeding stuff, including traditional products, as well as other issues of relevance for the safety of food and feeding stuff, for the purpose of protection of human life and health, environment and efficient market operation. The Administration for Food Safety, Veterinary and Phytosanitary Affairs is the competent administrative authority dealing with issues in the area of food safety.

In the field of emergency situations, the Law on Protection and Rescue ("Official Gazette of Montenegro", No. 13/07, 05/08, 86/09, 32/11, 54/16) and the Strategy for Disaster Risk Reduction with Dynamic Action Plan for the implementation of the Strategy for the period 2018-2023 were adopted.

The Criminal Code („Official Gazette of the Republic of Montenegro", No. 70/03, 13/04, 47/06, „Official Gazette of Montenegro", No. 40/08, 25/10, 73/10, 32/11, 64/11, 40/13, 56/13, 14/15, 42/15, 58/15) stipulates the following actions as criminal acts: export and import of hazardous substances, unlawful handling of hazardous substances, unauthorized building of nuclear power facilities, failure to enforce the decision on environmental protection measures, breach of the right to environmental information, causing general danger, threat to safety with nuclear materials, terrorism, use of lethal devices and destruction and damaging of nuclear facility.

In the period since 2009, when the existing Law on Ionizing Radiation Protection and Radiation Safety was adopted, the Acquis Communautaire in the field of ionizing radiation protection and radiation safety has significantly changed, international legal instruments have been confirmed and standards and guidelines adopted at the international level by the International Atomic Energy Agency and the International Commission on Radiological Protection, in order to improve the protection of human health and the environment in this area, it was necessary to start drafting **the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security**. Previously, a detailed analysis of the existing Law and bylaws that need to be drafted was performed. The analysis showed that the adoption of bylaws would not significantly improve the system because there are significant limitations due to the impossibility of transposing the acquis that has been significantly changed and the need to change and upgrade the system in this area, with a completely new approach. Therefore, the conclusion of the analysis was to start drafting a completely new Law with a set of bylaws that will enable its full implementation, which will, based on experience and implementation so far, significantly improve the protection of human health and the environment from the harmful effects of ionizing radiation which may stem from peaceful use of ionizing radiation, and thus facilitate the Law implementation for end users.

In addition, such a framework needs to be aligned with the Acquis Communautaire, international standards and the guidelines and obligations that Montenegro has taken over from international legal instruments. The process of drafting the text of the Proposal of the Law lasted for two years, during which an intensive Public Debate was conducted, whose results are presented in the Report on the conducted public consultation, which is a publicly available document. More detailed information on the public consultation and public participation is provided in the Report in **Section K: Planned Activities for Safety Improvement.**

The Government of Montenegro at its session held on 16 January 2020 has approved the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security and submitted it to the Parliament of Montenegro for consideration and final adoption.

The proposed Law improves:

- application of a graded approach to authorisation procedures;
- consideration of the justification of the practices when using ionising radiation;
- demonstrating that requirements concerning safety and security are met to possess an ionising radiation source before use;
- the system of issuing authorisations which are time-limited and will not, therefore, cause undue pressure on inspection activities;
- the system of issuing authorisations (vocational training, decommissioning, disposal, possession of ionising radiation sources, etc.);
- more detailed misdemeanour provisions;
- legal basis for drafting by-laws;
- system of adequate prohibitions;
- the security aspect of ionising radiation application;
- medical exposure, in particular in terms of controlling the exposure of patients, carers and comforters;
- carrying out a practice where radioactive material with elevated concentrations of natural radionuclides (NORM) may occur;
- protection against radioactive gas radon;
- governing for the first time the authorisation of radioactive waste export and transit and spent fuel transit, which must be allowed;
- governing for the first time the authorisation of the import, export, transit, transport and use of nuclear materials;
- application of safeguards from ratified international legal instruments related to nuclear materials, and the like.

The provisions of the standards and guidelines of the International Atomic Energy Agency and the International Commission on Radiological Protection, the following Acquis Communautaire of the European Union have been transposed into the Proposal of the Law:

1) Council Directive 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/EURATOM and 2003/122/Euratom;

2) Council Directive 2013/51/EURATOM of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption;
3) Council Directive 2011/70/EURATOM of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste;
4) Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations;
5) Council Directive 2014/87/EURATOM of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations;
6) Council Directive 2006/117/EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel;
7) Commission Regulation (EURATOM) No 302/2005 of 8 February 2005 on the application of Euratom safeguards;
8) Commission Decision 2008/312/EURATOM of 5 March 2008 establishing the standard document for the supervision and control of shipments of radioactive waste and spent fuel referred to in Council Directive 2006/117/Euratom;
9) Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work;
10) Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work (ninth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC);
11) Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace (first individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC);
12) Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace (third individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC);
13) Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).

In addition, certain provisions of ratified international legal instruments as well as the provisions of non-binding instruments have been transposed into the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security.

European Commission's support was used in 2018 during the drafting of the Proposal of the Law, to check the compliance of the first draft of the Law with the Acquis Communautaire of the European Union on ionising radiation protection, which was the main activity within the regional project supported through the European Commission's Instrument for Pre-accession Assistance (IPA) multi-beneficiary project “Further Strengthening of Nuclear Regulatory Bodies of Albania, Bosnia and Herzegovina, Kosovo, Northern Macedonia, Montenegro and Serbia”. An evaluation of the draft law was included in European Commission's Report.

The enactment of this Proposed Law is done in pursuit of one of the key priorities of the Government of Montenegro concerning public health and wellbeing, as pointed out in Governmental Medium-term Work Programme for the period 2018 - 2020. In addition, this Law will also work in favour of achieving the targets set in the National Sustainable Development Strategy by 2030, particularly as regards improving human resources and strengthening social inclusion with the recognised strategic goal of ensuring healthy lives and promoting wellbeing for all at all ages, and by improving health protection of vulnerable and deprived groups, in line with SDG 3 (3.2 and 3.7).

With the adoption of this Law, progress will be made in several negotiation chapters, where the area of protection against ionizing radiation, radiation and nuclear safety and security permeates horizontally. First of all, it refers to the negotiating chapters: 15 - Energy, 19 - Social policy and employment, 24 - Justice, freedom and security, 28 - Consumer and health protection, 30 - External relations and 31 - Foreign security and defense policy.

The Proposal of the Law is presented in XIX legal postulates that clearly indicate the rights and obligations, both implementers and legal and natural persons to which this area applies, all in order to protect human life and health and the environment from the harmful effects of ionizing radiation during their inadequate application.

Given that it is paramount for general population to govern the liability for nuclear damages sustained through a nuclear accident/incident in relation to nuclear material, as well as the accident/incident in a nuclear facility wherever it may be located, which has adverse effects on the public health and the environment within the territory of Montenegro, this Law sets basic guidance, particularly for issuance of certain licences and approvals, for depositing funds to a specific Budget subaccount (nuclear account) for possible coverage for any nuclear damages occurring while performing licenced and/or approved activities in line with separate legislation governing liability for nuclear damages. Detailed regulation of this area will be provided in a separate Law which is to govern liability for nuclear damages and reflect Montenegro's commitments under ratified international treaties on liability for such damages.

The Proposal of the Law envisages the graded approach of authorisation process (registration (2), licensing (23), and approvals (14)) and permits (5) for performing various tasks, in line with the commitments stemming from the European Union Acquis, based on risks associated with such practices. The authorisations and permits are of limited validity, which has not been the case so far. With regard to developing and applying the graded approach, first, the categorisation of ionising radiation sources and nuclear materials has been done. To be able to regulate practices, the necessary precondition was to regulate the justification of such practices as the initial step to inform other steps in the process of issuing registration decisions, licences or approvals. Unjustified practices are banned, while justified practices, depending on the proofs submitted to the Agency in the process for applying for each practice, are subject to issuance of registration decisions, licences or approvals. It, moreover, envisages practices which may be exempted from the notification obligation only if they meet the exemption criteria. Also, it is envisaged that certain practices which involve handling materials with increased NORM contents, a decision may be made not to apply exemption if such practices may lead to the presence of NORM in drinking water or affect its quality or have other exposure pathways. It is stipulated that practices which are subject to issuance of registration decisions, licences or approvals, may be subject to

notification only, provided they meet the general criteria for exemption and clearance and are subject to mandatory inspection.

According to the graded approach, as the new approach introduced by the EU acquis, practices involving ionising radiation are subject to: **notification, issuance of registration decisions, licences and/or approvals and inspection controls** commensurate to their size and probability of exposure and the impact they may have, with the aim of minimising such exposure or improving radiation and nuclear safety and security.

It is envisaged that this Law will enter into force on the eighth day from the day of its publication in the "Official Gazette of Montenegro", and will start with applicaton on 1 June 2023. The final provision stipulates that bylaws for the implementation of this Law will be adopted within three years from the day this Law enters into force (there are 112 legal bases for bylaws and thematic documentation, the Law on Liability for Nuclear Damage). The Proposal of the Law precisely defined obligations of all interested parties and entities. Aware of the complexity of the obligations imposed by the new Law, which are only the minimum conditions required by the transposed Directives and the shortcomings of the existing Law that apply during its implementation, it is estimated that a period of three years is needed, not only for the adoption of bylaws that will enable its implementation, but it is also the period that economic entities need to prepare in a way that fulfills all the obligations that this Law provides for them.

In addition to that, a three month time limit is laid down from the day of commencement of application of the present Law for notifying the carrying out of practices. It is also stipulated that companies, other legal entities or entrepreneurs issued with licences in the field of ionising radiation protection and radiation safety before the entry into force of the present Law are obliged to harmonize their operations with the provisions of the present Law within 2 years from the day of commencement of application of the present Law. Apart from the above, it is stipulated that undertakings and permit holders and employers which possess proof of vocational training for their employees acquired prior to the application of the present Law, are obliged to obtain new proof of vocational training for such persons in accordance with the provisions of the present Law, within three years from the day of commencement of its application.

Deadlines for the adoption of local radon protection action plans for local self-government units for radon prone areas and other non-radon prone areas have also been set. Also, the time limit for establishing national diagnostic reference levels has also been set. It was emphasised that procedures that have been initiated by the date of application of the present Law shall be completed according to the regulations in force until the day of commencement of application of the present Law. Apart from the above, provisions on reporting to the European Commission that will apply from the date of Montenegro's accession to the European Union have been set.

Given that the application of this Law is planned for 2023, it is necessary to plan funds during 2022 for 2023. In addition, for the implementation of this Law, it will be necessary to secure financial resources from other sources of financing.

During the drafting of the Proposal of the Law, special attention was paid to the **removal of business barriers and the creation of a competitive market**, which is especially

reflected in the series of given jobs for which legal entities will be created or entrepreneurs who will perform them.

Aiming to boost market competition and trade facilities, the Proposal of the Law took into account the recommendations given in the Final Report of the "Addressing Market Access Barriers in Selected Supply Chains in CEFTA" project implemented in the six CEFTA countries. The project was implemented by UNICTAD and the International Trade Centre (ITC) in collaboration with the German Federal Ministry for Economic Cooperation and Development. A number of analyses was developed within the framework of this project focusing on different barriers to trade identified by the private sector, and recommendations were given for addressing them, including some for radioactivity control. In this regard, the Proposal of the Law envisages **recognition of certificates/proof of radioactivity check** upon import and transit of water, metal, metal products and metal raw and building materials, which reduce business barriers.

As regards costs for economy entities, these mostly come down to the same ones incurred under the current Law, with the exception of the costs for developing and implementing: the Initial and Final Decommissioning Plan; the Operational Radioactivity Monitoring Programme; Extraordinary Radioactivity Monitoring Programme; Safety Report to ensure the safety of the facility and activity and/or practice undertaken therein to protect lives and the environment against ionising radiation; Radioactive Waste Management Plan; Programme of Protection Against Ionising Radiation; Quality Assurance and Quality Control Programme. In addition to the above, employers need to allocate funds for radon measurements at specified workplaces; for clinical audit done once in 5 years for the activities and/or practices involving medical exposure.

Also, given that conditions are put in place for authorisation of legal entities and/or entrepreneurs in the area of ionising radiation protection, currently unavailable in Montenegro, this will give an impetus to job generation, and as such will generate additional revenues (payroll taxes, corporate tax, personal income tax, VAT, customs charges, etc.). Moreover, revenues for the Budget will also be generated by foreign legal entities which meet the requirements stipulated by the present Law becoming active in the Montenegrin market.

It is envisaged that the Ministry of Sustainable Development and Tourism will oversee the implementation of this Law and regulations adopted on the basis of this Law. Inspection over the implementation of the present Law and regulations adopted pursuant to the present Law will be performed by the state administration body responsible for inspection affairs via the environmental inspectorate, i.e. ionising radiation protection inspectors, as well as other inspectorates, in line with the present Law, other separate laws and the Law governing inspection. This chapter also prescribes mandates of environmental inspectors and ionising radiation protection inspectors, mandate of food inspectors, mandate of veterinary and phytosanitary inspectors, mandate of health and sanitary inspectors, mandate of market inspectors, mandate of inspectors for electronic communications and postal activities, as well as mandate of customs authorities.

In the forthcoming period it is necessary to continuously work on strengthening the capacity of the Ministry of Sustainable Development and Tourism, the Nature and Environmental Protection Agency, the Administration for Inspection Affairs and the Ministry of Interior and other inspection services, in accordance with the obligations from negotiating positions, in order to enable full implementation of legislation, especially bearing in mind that in these institutions mostly the same employees deal with protection against non-ionizing radiation.

In the area of ionizing radiation protection, radiation and nuclear safety and security, Montenegro is the contracting party to twentyone (21) international legal instruments, listed in the Annex 2. Beside the above mentioned international legal instruments, Montenegro, from the aspect of international law, also applies the following:

- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR Agreement) with its integral components, Annexes A and B;
- Convention concerning International Carriage by Rail – (COTIF);
- Regulation concerning the International Carriage of Dangerous Goods by Rail – RID;
- Convention on International Civil Aviation;
- Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc. 9284 AN/905), including additions, amendments and corrections;
- European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN).

In January 2016, Montenegro, on the proposal of the Ministry of Sustainable Development and Tourism, formally expressed readiness for voluntary implementation of a non-binding Code of Conduct on the Safety and Security of Radioactive Sources and Supplementary Guidelines on the Import and Export of Radioactive Sources and the contact person for Code was appointed at the same time. In January 2019, Montenegro prepared a letter to the Director General of the IAEA and expressed readiness to implement the Supplement Guide on the Management of Disused Radioactive Sources and contact person for the Guide was appointed.

In addition, Montenegro is a member of the systems:

- RASIMS, which present Radiation Safety Information Management System ;
- NUSIMS, which present Nuclear Security Information Management System;
- EPRIMS, which present Emergency Preparedness and Response Information Management System.

Montenegro participates with its representatives in platforms International Nuclear and Radiological Event Scale (INES) and Unified System for Information Exchange in Incidents and Emergencies (USIE), which includes radioactive sources with potential transboundary impact.

Since 2006, Montenegro has been a member of the Incident and Trafficing Database (ITDB).

In addition, representatives of Montenegro are the members of the:

- Nuclear Safety Guidance Committee (NSGC);
- Radiation Safety Standards Committee (RASSC);
- Waste Safety Standards Committee (WASSC);
- Emergency Preparedness and Response Standards Committee (EPReSC).

6.1.1 Licensing System

The licenses in the area of ionizing radiation protection and radiation safety, which are not time-limited, are issued by the Nature and Environmental Protection Agency on the

basis of the provisions of the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) and the related secondary legislation, Law on General Administrative Procedure ("Official Gazette of the Republic of Montenegro", No. 60/03, "Official Gazette of Montenegro", No. 73/10, 32/11), Law on Administrative Procedure ("Official Gazette of Montenegro", No. 56/14, 20/15, 40/16, 37/17) and the Law on Transportation of Dangerous Goods ("Official Gazette of Montenegro", No. 33/14, 13/18).

The Nature and Environmental Protection Agency keeps the RAIS database (Regulatory Authority Information System), which contains, among other things, the data on issued licenses. On the basis of the above mentioned legislation, the Nature and Environmental Protection Agency, among other things, issues licenses for: performing radiation activity; temporary performing radiation activity; trade in ionizing radiation sources – import; trade in ionizing radiation sources – export; circulation of ionizing radiation sources – transit; transport (carrying) of ionizing radiation sources; radioactive waste storage management.

The most demanding procedure in Montenegro in this area was related to the issuance of a license for the management of radioactive waste storage, which became operational on 13 June 2012 by issuing a license to LLC "Center for Ecotoxicological Research", which was described in detail in the Second National Report on the Implementation of Obligations Arising from the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The storage facility fully meets all safety requirements defined by Law and bylaws for safe and secure storing of radioactive waste and disused sealed radioactive sources, in accordance with international standards. A detailed Report on the licensing of this storage facility and the participation of the Montenegrin public in the whole process is described in detail in previous national reports on the implementation of obligations arising from the Joint Convention on Safety of Spent Fuel Management and Safety of Radioactive Waste Management.

Based on the database from the information system that it maintains, the Nature and Environmental Protection Agency issued a **total of 253 permits in the period between 1 October 2017 and 31 July 2020 (Table 1).**

Table 1: **Licences issued in the period between 1 October 2017 and 31 July 2020**

LICENCE	NUMBER OF ISSUED LICENCES
Licences for performing radiation activities	**67**
Licence for temporary perfoming radiation activities	**3**
Licence for trade in source of ionizing radiation - import	**89**
Licence for trade in source of ionizing radiation- export	**18**
Dozvole za promet izvora jonizujućeg zračenja – tranzit	**0**
Licence for transport of sources of ionizing radiation	**76**
TOTAL	**253**

The Nature and Environmental Protection Agency, as one of important players of the radioactive waste management process, is working continuously on the **inventory of radioactive waste** in Montenegro. In addition, **data on radioactive sources in Montenegro are continuously updated**, and they are in the RAIS database, as well as data on professionally exposed persons. The database is updated every day with relevant data concerning trade and transport of radioactive materials, as well as trade, transport and use of all sources of ionizing radiation in our country.

For the purpose of more effective and more efficient work, the staff of the Department for Radiological and Nuclear Safety and Security and Ionizing and Non-ionizing Radiation Protection of the Nature and Environmental Protection Agency participated in the work of commissions for assessing the fulfilment of conditions for performing radiation activities.

According to the *Law on Transport of Dangerous Goods ("Official Gazette of Montenegro", No. 33/14, 13/18),* the Ministry of Interior - Directorate for Emergency Situations issued **63 compliance for transport of dangerous materials in the period between 1 October 2017 and 31 July 2020** in the regular procedure of issuing licences for trade in radioactive materials issued by the Nature and Environmental Protection Agency.

The Nature and Environmental Protection Agency **has developed six internal procedures** relating to issuing of various licences:

- Procedure for issuing licences for mobile industrial radiography (gamma defectoscope);
- Procedure for issuing licences for performing radiation activities in medicine - use of high energy ionizing radiation generators – accelerators;
- Procedure for issuing licences for performing radiation activities - use of devices with sealed source of ionizing radiation in medicine for radiotherapy – brachytherapy;
- Procedure for issuing licences for trade (import/export/transit) in sources of ionizing radiation;
- Procedure for issuing licences for performing radiation activities – use of dental X-ray machine; and
- Procedure for issuing licences for performing radiation activities - use of open sources of ionizing radiation for diagnostics and therapy in nuclear medicine.

In the framework of the regional project supported by the European Commission through the pre-accession instrument of European Union, IPA multi-beneficary project "Further strengthening of the nuclear regulatory bodies of Albania, Northern Macedonia, Bosnia and Herzegovina, Serbia, Kosovo (under UNSCR 1244/1999) and Montenegro", representatives of the Nature and Environmental Protection Agency has checked the existing procedures and performed their audit to ensure more systematic approach to licensing.

Future changes in the licensing process

Taking into account the requirements of the IAEA GSR Part 3 - Radiation Protection and Safety of Ionizing Radiation Sources - International Basic Safety Standards, other IAEA Standards and Publications and Provisions of European Council Directives, in the new Proposal of Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security a graded approach has been established in defining the conditions for performing practices and the time period for validity of licenses is given, which is a novelty in relation to the existing legal framework. This means that through the

licensing system, the following has been introduced into the legal system of Montenegro within the Proposal of the Law: notification, registration and licensing, which has not been the case so far. Inclusion of scrap metal plants in the regulatory control process, inter alia, has been a particular challenge in transposing the requirements of international standards and the Acquis Communautaire of EU into national related legal framework. In that sense, close cooperation was established with all relevant entities in order to better standardize all requirements of international standards and the Acquis Communautaire, especially in the issuance of various permits, and this process was preceded by two years of development and consultation with stakeholders.

In order to achieve the mentioned requirements, it was necessary to define precise norms within the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, which will be further regulated through a set of regulations related to the licensing process, which primarily are related to application forms and exemption criteria. Following the adoption of the new Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, which is in the Parliament of Montenegro for final adoption, Montenegro will inform Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management about details that this legal act regulates this area.

6.1.2 Inspection Supervision

Inspection supervision in the area of ionizing radiation protection, radiation and nuclear safety and security is carried out, **with or without prior announcement**, by the ecological inspection of the Administration for Inspection Affairs, **on the basis of the annual plan and programme,** pursuant to the Law on Inspection Supervision ("Official Gazette of the Republic of Montenegro", No. 39/03, "Official Gazette of Montenegro", No. 76/09, 57/11, 18/14, 11/15) and the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16). Based on the above legislation, inspectors are entitled to institute, if necessary, misdemeanour or criminal proceedings, in case of violation of provisions of the above mentioned regulations.

To ensure a more efficient work, 13 following internal inspection procedures have been developed and approved:

- Procedure for transport of radioactive material;
- Procedure for inspection when removing radioactive lighting rods (dismantling and removal of radioactive lighting rods, transport and response in emergencies);
- Procedure for inspection of sealed sources (fixed devices for calibration, detection and other devices);
- Procedure for control of radioactive sources which are used in industrial radiography;
- Procedure for control of nuclear medicine;
- Procedure for inspection of X-ray machines;
- Procedure for control of mobile sealed radioactive sources;
- Procedure for inspection of stationary devices which are used for industrial radiography;
- Procedure for inspection of linear accelerator;

- Procedure for inspection of gamma irradiators;
- Procedure for inspection of open radioactive sources which are used in industry;
- Procedure for inspection of radiotherapy; and
- Procedure for inspection of radioactive waste storage.

In the framework of the regional project supported by the European Commission through the pre-accession instrument of European Union, IPA multi-beneficary project "Further strengthening of the nuclear regulatory bodies of Albania, Northern Macedonia, Bosnia and Herzegovina, Serbia, Kosovo (under UNSCR 1244/1999) and Montenegro", advices for updating existing procedures, which should be updated after the adoption of a new legal framework in the field of ionizing radiation protection, radiation and nuclear safety and security, has been given.

Following inspection orders, controls of radioactivity of goods during import are carried out in cooperation with the LLC "Centre for Eco-Toxicological Research" Podgorica and the JSC Institute of Ferrous Metallurgy Nikšić, in a way that upon the invitation of the inspection, and on the basis of legal acts, they control certain types of goods on radioactivity. During every appearance of certain consignments of scrap metal at border crossings, the inspection visits border crossings as needed, as well as during regular controls. In the event that an increased level of radiation is determined during the control of certain goods, the authorized persons secure the location and inform the inspection, which shall immediately go to the location (scene) and together with the customs authorities return the goods to the owner of the consignment. **In the period between 1 October 2017 and 31 July 2020 a total of 182.080 controls** of radioactivity for import/export or transit of metals, metal products and raw materials, as well as building material were performed(90.146 performed by LLC "Center for Ecotoxicological Research" and 91.934 by the Institute of Ferrous Metallurgy JSC Nikšić), in accordance with the Checklist and the List of Goods Subject to Radioactivity Control.

In order to have more efficiently control, a significant contribution to the development of a new legal framework in the field of ionizing radiation protection, radiation and nuclear safety and security was made by the Administration for Inspection Affairs, whose responsibilities are clearly divided. As the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security is in the process of being approved by the Parliament of Montenegro on innovations and improvements in the part of inspection supervision, Montenegro will inform the Contracting Parties to the Joint Convention at the Seventh Review Meeting of the Contracting Parties to the Joint Convention in 2021.

Pursuant to provisions of the Inspection Supervision Law ("Official Gazette of the Republic of Montenegro", No. 039/03, "Official Gazette of Montenegro", No. 076/09, 057/11, 018/14, 011/15, 52/16), Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16), Law on Administrative Procedure ("Official Gazette of Montenegro", No. 056/14, 020/15, 040/16, 37/17), Misdemeanour Law ("Official Gazette of Montenegro", No. 001/11, 006/11, 039/11, 032/14, 43/17, 51/17) and on the basis of the Criminal Code of Montenegro ("Official Gazette of the Republic of Montenegro", No. 070/03, 013/04, 047/06, "Official Gazette of Montenegro", No. 040/08, 025/10, 073/10, 032/11, 064/11, 040/13, 056/13, 014/15, 042/15, 058/15, 44/17, 49/18), **in the period between 1 October 2017 and 31 July 2020, the ionising radiation inspector has:**

- **conducted 308 inspection supervisions** to control persons performing radiation activities (verbal warning for minor irregularities, etc.);
- **issued 202 Decisions** regarding taking of certain measures and actions to remove established irregularities, measure the level of individual external exposure of professionally exposed persons, conducting health examination of professionally exposed persons who work in a radiation zone, dosimetry examinations, control of working environment and measuring for the purpose of implementation of the programme of quality assurance and control for sources of ionizing radiation, obtaining the Decision on fulfilment of prescribed conditions for using sources of ionizing radiation;
- **issued 3 Decrees;**
- **submitted 1 request for instituting misdemeanour proceedings** under the Law on Ionizing Radiation Protection and Radiation Safety;

Regarding administrative procedure and a possibility to appeal which, *inter alia*, reflect independence of work of the competent institution, the Law on Administrative Procedure envisages that any individual or organisation whose right has been violated by the decision of the first-instance authority (in this case the Nature and Environmental Protection Agency or Administration for Inspection Affairs) may appeal to the second-instance authority (Ministry of Sustainable Development and Tourism) within 15 days from the date of the Decision. Appeal is the general remedy for instituting the administrative procedure at the second instance and represents a process of control of the first-instance authority. The second-instance procedure may not be instituted without filing an appeal, nor can it be implemented ex officio. The above Law regulates general administrative procedure and unless special regulations in the field of environment protection regulate these matters, provisions of this Law shall apply in the decision-making process.

In the Fourth Report, Montenegro wishes **to highlight the previously successfully conducted inspections** during the collection and transportation of disused radioactive sources and radioactive lightning rods, during the conditioning of disused sealed radioactive sources in the radioactive waste storage facility, as well as inspections of the radioactive waste storage facility.

Having in mind the fact that disused radioactive sources, radioactive lightning rods and other radioactive material are stored in a safe and secure manner in the radioactive waste storage facility, we appreciate that it is important to describe in this Report the key elements of regular inspection of the radioactive waste storage facility, **which is** conducted twice a year.

Key elements of regular inspection control of radioactive waste storage facility are:

1) Control of identification data on:
   - The name and other relevant information about the institution which is the operator,
   - Storage management, officer who is responsible for radiation protection, radiation protection expert, quality control monitoring system.

2) Safety control which includes:

- Control of the data on radioactive waste inventory which is in the storage and the manner of its monitoring;
- Control of accessibility and safety of the inventory database;
- Control of the source and waste monitoring system, from identification through to storage itself;
- Control of the storage design (description is provided for all variations and changes compared to the ones approved by the regulatory body during the licensing process, i.e. whether safety assessment was conducted after the changes were made, whether physical protection is ensured, whether the fire detection system is in working order, who manages physical protection of the storage, what is the video surveillance system for the storage and the surrounding of the storage, breaking in system, automatic ramp for the storage access control, control of keys, a key in case of accidents, etc.).

3) Control of monitoring data for radioactivity of the surrounding of the storage;

4) A system for controlling safety inside the storage (waste acceptance criteria, safety assessment by a qualified radiation protection expert, ventilation control, control of filters, control of air humidity, control of potentially contaminated water, control of precipitation discharge - drainage, control of water from handling area, control of the system for electrical equipment security, control of fire warning signs);

5) Control of the Protection Programme (whether the programme is in place, control of measuring equipment, control of personal dosimetry equipment, control of personal protection equipment, control of the storage entry and exit system, control of the warning system, identification of packages and space);

6) Control of monitoring of occupationally exposed persons;

7) Safety activities (preparation of waste in the storage, safety actions related to the activities of the person responsible for radiation protection, data on dose limits, marking of controlled areas, notifications such as radiation warnings);

8) Local rules and monitoring (whether rules exist in written form, whether workers are familiar with procedures, control of procedures);

9) Data on management (whether there is communication with the fire department and security, whether management is providing adequate staffing, whether management ensures adequate resources for training of the staff, whether management ensures adequate equipment, etc.);

10) Control of the area (control of visitors, control of temporary workers (external employees), control of the population);

11) Discharge of material from the storage (in accordance with a special programme);

12) Interim storage (in accordance with a special programme);

13) Accidents (in accordance with a special programme);

14) Records.

Having analysed previous inspection activities in this area and taking in consideration new requirements of international standards and EU directives, in the previous Third National Report on the Implementation of Obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Montenegro emphasized the need to strengthen inspection supervision from the quantitative and qualitative point of view, by engaging an additional number of inspection officers and through a continuous professional education in the country and abroad, according to the development of technologies, etc.

In this regard, the Government of Montenegro, pursuant to Article 28, paragraph 4 of the Law on Public Administration ("Official Gazette of Montenegro", No. 078/18), at the proposal of the Director of the Administration for Inspection Affairs, adopted the Rulebook on Internal Organization and Systematization of the Administration for Inspection Affairs, which envisages that the work of protection against ionizing and non-ionizing radiation is performed by three additional persons who need to be employed. This is also an improvement in this part compared to the presented within the Third Report of Montenegro.

Starting from the fact that the application of ionizing radiation is complex and that its improper use can lead to endangering human health and the environment, it is necessary to constantly work on professional training and retraining of professionally exposed persons, as well as employees in competent institutions and competent inspections services. Emphasizing the importance of constant improvement of employees, this norm is an integral part of the new Proposal of the Law on Protection against Ionizing Radiation, Radiation and Nuclear Safety and Security. In addition, it is regulated that the costs of conducting professional training for employees from the competent state institutions are provided from the Budget of Montenegro.

Regarding the training plan for inspectors and other employees from the competent institutions that represent the regulatory body in the field of ionizing radiation protection, the Strategy for Protection against Ionizing Radiation, Radiation Safety and Radioactive Waste Management envisages the adoption of a special training program in radiation and nuclear safety and security and protection against ionizing radiation, which could be adopted on a multi-annual basis, in accordance with the recommendations of the International Atomic Energy Agency (IAEA).

It is important to point out that vocational training and retraining for the implementation of measures against ionizing radiation of all other persons, who perform radiation practices are related to ionizing radiation, will be performed by a legally authorized person on the basis of the Framework Program checks of vocational training and retraining which will be an integral part of the Rulebook on vocational training, which should be adopted by the Ministry of Sustainable Development and Tourism with previously obtained opinion of the state administration body responsible for education and state administration body responsible for health affairs.

Until the development of the multi-annual training plan, the ionizing radiation protection inspectors will continue with the continuous trainings provided by the International Atomic Energy Agency and the European Commission, as well as on the basis of cooperation within the signed bilateral agreements.

6.2 Article 20: Regulatory Body

„Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.

Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation."

The national regulatory body for ionizing radiation protection, radiation and nuclear safety and security is structured within the Ministry of Sustainable Development and Tourism, the Nature and Environmental Protection Agency, the Administration for Inspection Affairs and the Ministry of the Interior. A clear division of competences is stipulated in the Decree on the organization and the method of work of State administration ("Official Gazette of Montenegro", No. 87/18, 002/19, 038/19, 18/20), adopted by the Government of Montenegro. Interinstitutional cooperation is regulated by the Law on State Administration ("Official Gazette of Montenegro", No. 78/18).

According to the Decree on the organization and the method of work of State administration ("Official Gazette of Montenegro", No. 087/18, 002/19, 038/19, 18/20), the Ministry of Sustainable Development and Tourism, among other things, carries out administration tasks in terms of creating policies and legal regulations for all aspects of ionizing radiation protection and radiation safety and radioactive waste management. It also governes the policy of international cooperation, conclusion of international agreements, follow-up of international standards, negotiations, coordination and implementation of international conventions and agreements, monitoring the process of accession to the European Union, harmonization with international standards, regulations and recommendations, etc. The Ministry of Sustainable Development and Tourism coordinates other relevant institutions at the national level, as the umbrella institution that conducts policy in this area and reports to the European Commission and the International Atomic Energy Agency on various aspects in this area, including the process of negotiating EU membership, reporting on the implementation of Council Directives in this area, as well as reporting on the implementation of international legal instruments.

The Law on the Environment ("Official Gazette of Montenegro", No. 52/16), Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) and the Decree on the organization and the method of work of State administration ("Official Gazette of Montenegro", No. 087/18, 002/19, 038/19, 18/20) stipulate that expert and related administrative duties in the area of ionizing radiation protection and radiation safety shall be carried out by the Nature and Environmental Protection Agency (license issuing, systematic testing of radioactivity in the environment, keeping the central register - database, etc.). The Nature and Environmental Protection Agency issues licenses for trading of ionizing radiation sources and radioactive materials, performance of radiation activity, temporary performance of radiation activity, license for radioactive waste storage management, as well as the license for legal entities involved in ionizing protection operations, all in accordance with the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16).

The Ministry of Interior has the Directorate for Emergency Situations which, within its scope of work, Division for risk management establishes a database for dangerous material under provisions of the Law on Transport of Dangerous Goods ("Official Gazette of Montenegro", No. 33/14, 13/18), which provides that the Ministry of Interior shall issue compliance for transport of radioactive material, which is furnished to the Nature and Environmental Protection Agency for the purpose of issuing licences.

In case of an accident likely to cause the state of emergency in the country, the responsible ministry is the Ministry of the Interior, which established the National Coordination Team for this purpose. In addition, the Ministry of Interior (Directorate for Emergency Situations) issues approvals for plans at the local level (municipal and entrepreneurial) that must be harmonized with the National Action Plan in the Event of a Radiation Accident. In addition to the above, the Ministry of Interior issues approvals for protection plans for mandatory protected facilities in accordance with the Law on Protection of Persons and Property ("Official Gazette of Montenegro", No. 043/18).

The Administration for Inspection Affairs was established following the adoption of the Law on Amendments and Supplements to the Law on Inspection Supervision ("Official Gazette of the Republic of Montenegro", No. 39/03, "Official Gazette of Montenegro", No. 76/09, 57/11, 18/14, 11/15, 52/16), and it gathers the largest number of inspection services, including the ecological inspection, which is competent for implementation of provisions of the Law on Ionizing Radiation Protection and Radiation Safety.

In addition to the above mentioned institutions, the regulations related to the trade and control under the Law on Foreign Trade ("Official Gazette of the Republic of Montenegro", No. 28/04, 37/07, "Official Gazette of Montenegro", No. 73/10, 1/14, 14/14, 57/14), Law on Control of Export of Dual-use Items ("Official Gazette of Montenegro", No. 30/12), Law on Foreign Trade in Weapons and Military Equipment ("Official Gazette of Montenegro", No. 40/16) are enforced by the Ministry of Economy, Ministry of Defence, Police Administration and Customs Administration of Montenegro and competent inspection departments.

Following the Decision of the Director of the Agency of 24 April 2012, the Advisory Committee for Ionizing Radiation Protection and Radiation Safety was established as the expert and advisory body. The Advisory Board, inter alia, has been involved in providing: recommendations to the licensing procedure for carrying out of ionizing radiation protection activities; opinion on laws and secondary legislation; opinion in connection with medical exposures to ionizing radiation; recommendations for job systematization in the radiation protection area; opinion on required trainings and additional training of staff in the area of ionizing radiation protection; opinion when issuing more complex licenses requiring special safety analysis; opinion to the program of systemic testing of radioactivity in the environment; opinion in connection with international conventions in the area of ionizing radiation protection and radiation safety, etc.

Since the mandate of the Advisory Committee expired following the implementation of the measure 16 of the Action Plan of the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for 2017-2021, it was proposed to have re-election or to appoint new members of the Advisory Committee.

State institutions constituting the national regulatory body in the area of radiation and nuclear safety and security and ionizing radiation protection have a Programme Budget and are financed from the Budget of Montenegro, in accordance with the Law on Budget,

which is annualy adopted, and the Law on Budget and Fiscal Responsibility ("Official Gazette of Montenegro", No. 20/14, 56/14, 70/17, 04/18, 55/18, 66/19).

The national regulatory body in the area of radiation and nuclear safety and security and ionizing radiation protection is autonomous in execution of its tasks. Tasks of all the four competent institutions are divided pursuant to the Decree on the organization and the method of work of State administration ("Official Gazette of Montenegro", No. 087/18, 002/19, 038/19, 18/20), and to the respective legislation on ionizing radiation protection and radiation safety, inspection supervision, transport of hazardous substances, protection and rescue, protection of persons and property.

As for independence of regulatory bodies, we point out that pursuant to the Decree on the organization and the method of work of State administration, supervision of legality and suitability of work of administration authorities is performed by Ministries (in this case the Ministry of Sustainable Development and Tourism supervises the Nature and Environmental Protection Agency). In performing supervision, the Ministry: suspends acts adopted outside administrative procedure when they are contrary to the law and other regulations and proposes to the Government to abolish or annul them; gives proposals for appointing and dismissing heads of independent administration authorities whose work it supervises; requests reports and notifications of particular matters under the competence of administration authorities; gives expert guidelines, clarifications, instructions and advice for application of regulations under the competence of administration authorities; gives assessment of the situation regarding progress reports; defines individual tasks of administration authority; indicates weaknesses and illegalities in the work of administration authority and gives proposals for overcoming them; warns administration authority of observed work irregularities, initiates suspension of the administrative authority whose work it supervises and performs other control of work and actions of administrative authority, in accordance with regulations.

Also, in accordance with the Decree on the organization and the method of work of State administration, supervision of the legality and suitability of work and legality of administrative acts for individual administrative fields under the competence of the **Administration for Inspection Affairs** is conducted by the Ministries competent for a particular administrative field (supervision of administrative acts of ecological inspection is performed by the Ministry of Sustainable Development and Tourism).

Supervision of coordinated work of inspections of the Administration for Inspection Affairs is performed by the Government, through the Ministry of Public Administration.

Montenegro is a small system with limited use of radioactive sources and sources of ionising radiation and establishing of an independent state administration body is currently not sustainable.

Regarding influence of, for example, budget control, mechanisms have been put in place to control spending of approved annual budget, primarily through the Law on Budget and Fiscal Accountability, Law on Public Procurement, and through the system of inspections of the State Audit Institution, which controls all spending units. Also, control mechanisms have been put in place separately within each institution in which internal audit control is in place.

As far as the reporting obligation is concerned, competent institutions report to the Government of Montenegro once a year about the progress in work for all areas of their competence, **and all documents are publicly available.** In addition, the Nature and Environmental Protection Agency reports to the Ministry of Sustainable Development

and Tourism on its work, as appropriate, while the Administration for Inspection Affairs reports to the Ministry of Public Administration.

6.2.1 Administrative and Technical Capacities

In four competent institutions (Ministry of Sustainable Development and Tourism, Ministry of the Interior, Nature and Environmental Protection Agency and Administration for Inspection Affairs) there is a **total number of eight (7) employees** working on tasks related to ionizing radiation protection and radiation and nuclear safety and security.

In addition to one employee (B. Sc. in Physics) in the Ministry of Sustainable Development and Tourism, the process of development of the legal framework also involves two lawyers from the Directorate for the Environment, which works on other segments of the environment as well.

In the Nature and Environmental Protection Agency, there are **four (4) employees** out of the total number of six (6), which is the number planned by the Rulebook on Internal Job Organization and Systematization of the Agency, in the Department for Radiological and Nuclear Safety and Security and Ionizing and Non-ionizing Radiation Protection.

In the Administration for Inspection Affairs, there is one inspector working on issues related to ionizing radiation protection.

In the Ministry of the Interior (Directorate for Emergency Situation) there is one employee.

Employment of civil servants of competent institutions is performed on the basis of a public competition in accordance with the Law on Civil Servants and State Employees ("Official Gazette of the Republic of Montenegro", No. 2/18, 34/19). Pursuant to Article 41 of the Law on Civil Servants and State Employees ("Official Gazette of Montenegro", No. 2/18, 34/19), the filling of the position of the head of the administration body (Director of the Nature and Environmental Protection Agency) is performed on the basis of a public competition. The Minister responsible for the environment, on the basis of the results of the tests and after interviews, proposes Government to appoint a Director, for a period of five (5) years.

Article 60 of the aforementioned Law stipulates that the term of nominated or appointed person (Director of the Agency) shall expire:

- with the expiration of mandate;
- upon personal request;
- with termination of employment;
- by dismissal.

This person shall be dismissed if:

- was sentenced to unconditional imprisonment;
- has been convicted of an offense which renders him or her unworthy of a public authority;
- the executive order imposes a disciplinary measure on termination of employment; and
- in other cases prescribed by a special law.

As far as **nuclear security is concerned**, it should be underlined that the following institutions play an important role in this area: Ministry of Sustainable Development and Tourism, Ministry of the Interior, Nature and Environmental Protection Agency, Administration for Inspection Affairs, Police Administration, Forensics Centre, National Security Agency, National Security Council, Customs Administration, Ministry of Public Administration, Ministry of Foreign Affairs, Ministry of Defence, Ministry of Science, Faculty of Natural Sciences and Mathematics, JSC Centre for Ecotoxicological Research, Institute of Ferrous Metallurgy JSC, Agency for Personal Data Protection, General and State Prosecution Offices.

In Montenegro, there are three authorized legal entities (technical services) that perform various measurements in the area of ionizing radiation protection: LLC "Centre for Eco-Toxicological Research", JSC "Institute of Ferrous Metallurgy" and the Faculty of Natural Sciences and Mathematics.

Taking in consideration obligations under the negotiating Chapter 15 – Energy as well as the obligations that Montenegro needs to comply with in the forthcoming period in the area of nuclear and radiation safety and security and ionizing radiation protection, strengthening of administrative and implementation capacities will continue in the form of continuous trainings and through an increase of employed persons, as underlined in the **Montenegro's Programme of Accession to the European Union** and recommendations of the European Commission presented in the final report for IPA 2007 project "EuropeAid/127007/C/SER/Multi – Assessment of regulatory infrastructure in the field of nuclear safety and radiation protection in Albania, Bosnia and Herzegovina, Croatia, Former Yugoslav Republic Macedonia (now Northern Macedonia), Kosovo (under the UN Security Council Resolution 1244), Montenegro and Serbia".

Therefore, in addition to the quantitative strengthening of administrative capacities, it is necessary to continuously work on the qualitative strengthening and continuous improvement of administrative capacities in Montenegro, as well as on the improvement of the capacities of professionally exposed persons. Within the framework of the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for its Implementation for the period 2017-2021, the need for planning the strengthening of existing capacities and new employments in relation to already systematized jobs was emphasized. Aware of the complexity and obligations imposed by the new Proposal of the Law, it is necessary to plan certain financial resources to strengthen the capacities of the Ministry of Sustainable Development and Tourism, the Nature and Environmental Protection Agency, the Administration for Inspection Affairs, the Ministry of Interior, as well as other inspection services according to obligations from negotiating positions, in order to enable full implementation of legislation, especially bearing in mind that in these institutions mostly the same employees deal with protection against non-ionizing radiation.

7 Section F: Other General Safety Provisions

7.1 Article 21: Responsibility of the License Holder

„Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the license holder and shall undertake appropriate measures to ensure that each of them meets its responsibility.
If there is no such license holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.“

The primary responsibility for safe and secure management of radioactive sources, including radioactive waste management, rests on the holder of the license for performing radiation activity and the holder of the license for radioactive waste storage management, pursuant to the provisions of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16). The provision therefore cover also the responsibility to ensure a safe and secure handling of disused sealed radioactive sources. High activity sealed radioactive sources are returned to the manufacturer/supplier or they are kept stored in central storage of radioactive waste facility when restitution (retrieval) to the manufacturer/supplier is not possible.

The Chapter VI of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16), Articles 37-40, includes provisions defining radioactive waste management, whereas more detailed conditions for radioactive waste management are defined by the respective secondary legislation. The Law also stipulates that license holders shall report to the Nature and Environmental Protection Agency any change related to the operation of ionizing radiation sources, termination of use of ionizing radiation sources as well as the manner of their keeping and storage and any change in relation to prescribed conditions based on which the license has been issued (Article 25).

The Administration for Inspection Affairs through Environmental inspections, Inspector for Ionizing Radiation Protection, on the basis of the Law on Ionizing Radiation Protection and Radiation Safety, the Law on Transport of dangerous goods ("Official Gazette of Montenegro Montenegro", No. 033/14, 013/18) and the Inspection Supervision Law(" Official Gazette of the Republic of Montenegro", No. 039/03, Official Gazette of Montenegro", No. 076/09, 057/11, 018/14, 011/15, 052/16) controls whether the licence holder conducts the practice in accordance with the aforementioned laws and conditions given in the licence. With a view to more efficient and effective work in the field of ionizing radiation protection, radiation and nuclear safety and security the Administration for Inspection Affairs developed 13 internal procedures.

In addition, it is important to point out that the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, in addition to the basic principles on which protection against ionizing radiation is based (Justification of application, Optimization of ionizing radiation protection and Exposure Limitation) defines the principle of graded approach, the principle of primary responsibility for safety and security and the principles on which radioactive waste management is based.

Guided by the **principle of primary responsibility for safety and security**, the a company, entrepreneur or another legal entity that has been issued a registration decision, licence, approval or permit to carry out a practice activities in the application of ionizing radiation **shall bear the primary responsibility** for:

- safe and secure carrying out of a practice;
- for the safety and security of facilities where the practice is carried out;
- for the safety and security of disused ionising radiation sources and radioactive waste at all stages of management.

The primary responsibility of these persons cannot be transferred to another person.

In addition to the above, **principles on which radioactive waste management** is based are very important. Thus, for example, one of principles is that the generation of radioactive waste shall be kept to the minimum, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials.

7.2 Article 22: Human and Financial Resources

„Each Contracting Party shall take the appropriate steps to ensure that:

(i) qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;

(ii) adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;

(ii) financial provision which will enable the continuation of appropriate institutional supervision and arrangements for continuing monitoring in the period deemed necessary following the closure of a disposal facility.“

The Government of Montenegro is the owner of the radioactive waste storage facility, which is administered, according to the license for radioactive waste storage management issued by the Nature and Environmental Protection Agency on 13 June 2012, by the Centre for Eco-Toxicological Research Podgorica.

Within the LLC "Center for Ecotoxicological Research", among others, there are a unit for radionuclide analysis and a unit for dosimetric and noise measurements, in which there are six (6) employees with university degrees, of which two have the a PhD degree, and one has a MSc degree. Pursuant to the Act on systematization of workplaces of this organization, four (4) employees are engaged in radioactive waste management, who are specially trained through scholarships implemented within the national project MNE3002 "Strengthening radioactive waste management", supported by the International Atomic Energy Agency (IAEA).

Pursuant to Article 38 of the Law on Ionizing Radiation Protection and Radiation Safety (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16), radioactive waste, until the conditions for its disposal are met, shall be stored with the legal person holding the license for radioactive waste storage management, while the costs for running the storage facility shall be provided from the Budget of Montenegro. Article 37 of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”,

No. 56/09, 58/09, 40/11, 55/16), stipulates that the maintenance costs for the storage of ionizing radiation sources and radioactive waste without known owner (orphan sources) shall be provided from the Budget of Montenegro, while Article 38 stipulates that the costs of maintenance of the storage facility shall be also ensured from the Budget of Montenegro.

At the proposal of the Ministry of Sustainable Development and Tourism, and after having obtained the approval of the Government of Montenegro, the Contract on use of temporary radioactive waste storage facility was signed on 11 October 2012 with the LLC "Centre for Eco-toxicological Research", holder of the licence for radioactive waste storage management. After the expiration of five (5) years on 1 September 2017 the ANNEX to the Contract on use of temporary radioactive waste storage facility No. 01-2144/6 dated from 11 October 2012 has been signed with LLC "Center for Ecotoxicological Research".

At the annual level, **in the amount of 50,000 euros**, financial resources from the Budget of Montenegro are allocated for the management of radioactive waste in storage, disused radioactive sources, orphan sources, as well as for the smooth operation and management of radioactive waste storage**.**

The corresponding institutional supervision of the radioactive waste storage facility, in terms of license issuing and the drawing up of a radioactivity monitoring programme is under the competence of the Nature and Environmental Protection Agency.

Inspection supervision is carried out by the Administration for Inspection Affairs through the ecological inspection, whereas the supervision of implementation of the *Law on Ionizing Radiation Protection and Radiation Safety* ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) is carried out by the Ministry of Sustainable Development and Tourism.

It is important to underline that the representatives of all the three authorities competent for the area of ionizing radiation protection and radiation safety undergo a continuous education through active participation in regional and national projects supported by the IAEA and the European Commission.

The holder of the license for performing radiation activity has the obligation to collect, keep, process, register and dispose radioactive waste in the prescribed manner and according to prescribed conditions, until its handover to the legal entity which is the holder of the licence for radioactive waste storage management, LLC "Centre for Eco-Toxicological Research".

Decommissioning is described in the definition given in the Rulebook on the method of collecting, keeping, processing and storing radioactive waste ("Official Gazette of Montenegro", No. 58/11) but only in relation to the radioactive waste storage facility, whereas the provisions of the Rulebook on detailed conditions for obtaining the license for radioactive waste storage management ("Official Gazette of Montenegro", No. 56/11) stipulate that the method of storage facility decommissioning is an integral part of the Safety Report which is provided by the applicant, within the procedure of obtaining the license for radioactive waste storage management.

In the Strategy for Ionizing Radiation Protection Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for its implementation for the period 2017-2021, special attention is paid to the Decommissioning of plants using radioactive sources and of plants holding in storage radioactive materials used in military activities (Section XIII) and to the Decommissioning of radioactive waste storage facility (Section XXI).

Considering the fact that funds have not yet been earmarked for the permanent shutdown and decommissioning of the storage facility, which became operational for a long-term management of radioactive waste on 13 June 2012, it is underlined in the Strategy set out guidelines that were standardize into the Proposal of the Law on Ionizing Radiation Protection and Radiation and Nuclear Safety and Security, in which it was necessary to define a provision which will stipulate the obligation to provide financial resources for permanent closure of the storage facility and decommissioning, which was precisrebed in detail.

Also, the new Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Insecurity prescribes the provision necessary to require the applicant to develop an Initial and Final Decommissioning Plan, while the content of decommissioning plans will be prescribed by a special Rulebook. The Proposal of the Law prescribes the requirements or conditions for the performance of decommissioning, including the necessary financial resources. Such solutions represent serious progress compared to existing legislation and regulations. More details on the manner in which the standardization was performed within the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security can be found in section **7.6 Article 26: Decommissioning**.

It is important to emphasize that the Proposal of the Law covered all costs, precisely prescribed them and that all this was preceded by the Regulatory Analysis of the Impact Assessment of the Proposal of the Law on: Budget of Montenegro, business entities, other persons and employers, competent institutions, competitiveness and improvement of business environment, as well as on the population.

7.3 Article 23: Quality Assurance

„Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste are established and implemented.“

Article 27 of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16) stipulates that the holder of the license for performing radiation activity has the obligation to establish and implement the Quality Assurance and Quality Control Programme for ionizing radiation protection measures, depending on the radiation activity performed by such license holder, i.e. depending on activities carried out by the legal entity in the area of ionizing radiation protection.

Quality assurance programmes are also established within the LLC “Center for Eco-Toxicological Research” (CETI). CETI is a well-equipped institution that carries out most of the radioactivity level measurements in Montenegro, and it has both human resources and organisational capacities to manage the radioactive waste storage facility. CETI has set up one of the best equipped laboratories in the region with full calibration standards for all measurement techniques, it has experienced staff for radiological measurements, decontamination, radiotherapy measurements, nuclear medicine measurements, radiation protection and has established the Quality Management System certified in accordance with ISO 9001:2000 standard and the laboratory accredited according to the ISO/IEC 17025 standard.

LLC “Centre for Eco-Toxicological Research” takes part in international inter-laboratory comparative research and in implementation of national and regional projects supported by the IAEA, many of which are related to radioactive waste management.

It is important to underline that the LLC “Centre for Eco-Toxicological Research” has developed all necessary procedures, both for the purpose of obtaining the license and for the purposes of management of disused sealed radioactive sources, including radioactive lightning rods. The LLC “Centre for Eco-Toxicological Research” has also developed all necessary procedures for the conditioning of disused sealed radioactive sources.

For the purpose of implementation of laws and secondary legislation in this area, the Nature and Environmental Protection Agency developed guidances for applicants for licenses defined by the Law, available on the Agency’s web page.

The Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for the period 2017-2021, unlike the previous Strategy, it devotes a **special chapter to radiation and nuclear safety and to safety and security culture.**

The Strategy emphasizes that in order to adequately protect the health of occupationally exposed persons, persons responsible for protection against ionizing radiation (radiation protection officers), employees of the competent state and administrative bodies in the field of protection against ionizing radiation, as well as the population, it is necessary to constantly work on improving the safety culture. Namely, a safety culture is a set of traits, attitudes, and behaviors that are established in application of ionising radiation sources, both at the institution level and at the level of individuals contributing to safety, as well as those who are active participants in carrying out certain activities with sources of ionizing radiation within the institution, as well as others that may be directly or indirectly threatened by possible accidents or incidents occurring within the institution where the sources of ionizing radiation are used. The Strategy emphasizes the importance of adhering to the fundamental principles of safety culture (in accordance with the IAEA SF-1 standard "Fundamental Safety Principles"), which are: individual and collective commitment in the field of radiation and nuclear safety; responsibility for all levels of safety, both for the individual and for the whole institution; constantly raising awareness of what it means and what contributes to the implementation of a safety culture at all levels.

It is also important to emphasize that for the first time, the Strategy for the Protection against Ionizing Radiation, Radiation Safety and Management of Radioactive Waste for the period 2017-2021 with the Action Plan for the period 2017-2021 also deals with the concept of security culture. Namely, it is emphasized that security culture represents the establishment of certain characteristics and attitudes, both at the individual and institutional levels that regulate issues related to: protection against theft or illegal seizure of nuclear or radioactive materials, malicious activity in nuclear or radiation facilities and malicious action during transport of nuclear or radioactive materials. Considering that the responsibility of the state in this matter is the greatest, relevant state institutions should establish a regulatory and legal framework that requires all institutions that are users of ionizing radiation sources, which store or transport radioactive or nuclear materials, to establish all measures that ensure their security through licencing process.

Article 17 of the *Rulebook on the method of collecting, keeping, processing and storing radioactive waste* defines, among other things, the acceptance criteria for the reception

of radioactive waste in the storage facility and they are an integral part of the Safety Report for the radioactive waste storage facility. The *Rulebook on detailed conditions for obtaining the license for radioactive waste storage management* defines, among other things, necessary documentation confirming that conditions for a safe and secure operation of the storage facility have been met. In relation to that, it is necessary to underline that **the Safety Report, as the most comprehensive document,** contains: access to the safety of the storage facility; description and analysis of the storage facility site; technical characteristics of the storage facility; analysis of the safety of the storage facility including the data; description of construction of the storage facility; organization of work of the storage facility; working conditions and restrictions; organization of ionizing radiation protection; the manner of and procedures for handling radioactive waste in the storage facility; radioactive waste data; the manner of and procedures for proceeding in case of radiation accident (planned measures in case of a radiation accident in the storage facility); the **Quality Assurance Programme for Radioactive Waste Management**, i.e. the quality assurance for providing a high quality management of the radioactive waste storage facility applying international standards (Quality Assurance Program); the manner of providing physical security and technical protection of the radioactive waste storage facility and the decommissioning method.

The issue of Quality Assurance and Quality Control has been specially elaborated within the Proposal of the Law on ionizing radiation protection, radiation and nuclear safety and security. It is envisaged that the Quality Assurance and Quality Control Program QA/QC will be developed by companies, legal entities and entrepreneurs who have applied for the issuance of certain licenses. The QA/QC Programme shall be developed by hiring ionising radiation protection experts, in accordance with the guidelines prescribed by the Ministry of Sustainable Development and Tourism, and shall be updated depending on the technology development and needs of undertakings, of which the Nature and Environmental Protection Agency shall be notified.

Funds for the development, implementation and updating of the QA/QC Program shall be provided by applicants for certain licenses, and its represent a condition for obtaining a license.

7.4 Article 24: Operational Radiation Protection

„Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel of radioactive waste management facility:

(i) the exposure of the workers and the public to radiation caused by the facility shall be kept as low as reasonably possible, taking economic and social factors into account;

(ii) no individual shall be exposed, in normal circumstances, to radiation doses which exceed national limits set in accordance to internationally adopted standards protection from radiation; and

(iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.

Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

(i) to keep exposure to radiation as low as reasonably possible taking into account economic and social factors; and

(ii) so that no individual shall be exposed, in normal circumstances, to radiation doses which exceed national limits that are in accordance with internationally adopted standards on protection against radiation.

Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects."

Primary responsibility for performing radiation activity, including radioactive waste management rests with the holder of the licence for performing radiation activity and holder of the licence for radioactive waste storage management, in accordance with provisions of the *Law on Ionizing Radiation Protection and Radiation Safety* ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16).

Article 4 of the *Law on Protection from Ionising Radiation and Radiation Safety* ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) regulates basic principles which are applied in performing radiation activities. The basic principle **justification of application** provides that each radiation practice should be planned and implemented in such manner that the use of ionizing radiation sources provides more benefit than the overall damage. The principle **optimization of ionizing radiation protection provides** that each radiation practice must be carried out in such manner to ensure that exposure to ionizing radiation is as low as reasonably possible, taking into account economical and social factors, while the principle concerning **limitation of individual exposure** stipulates that a radiation practice must be planned in such manner that exposures of individuals shall always be under established limits. Article 8 of the Law defines ionizing radiation protection measures for the purpose of protection of human life and health and of the environment from harmful effects of ionizing radiation, while Articles 11 and 12 of the Law stipulate measurements to be carried out for the purpose of assessment of ionizing radiation exposure and exposure limits, both for professionally exposed workers, persons undergoing educational programmes or scientific and research work and for the general public.

More details about exposure limits of professionally exposed workers and the general public are given in several secondary legislation documents, of which the most relevant are: the *Rulebook on the ionizing radiation exposure limits* ("Official Gazette of the FRY", No. 32/98) and the *Rulebook on limits of radioactive contamination of the environment and the methods of decontamination* ("Official Gazette of the FRY", No. 9/99). These Rulebooks are harmonized with ICRP 60 recommendation of the International Commission on Radiological Protection.

Additional protection mechanisms are internal operative levels which may be established by holders of the license for radioactive waste storage management. The same applies for individual exposure limits of the general public which ensures that in normal circumstances no person is exposed to radiation doses that exceed national limits, established according to internationally accepted radiation protection standards.

Holders of licenses for performing radiation practices, who possess radioactive sources or radioactive waste in the temporary storage facility, perform their activity on the basis of the issued license and they have the obligation to comply with the provisions of the *Law on Ionizing Radiation Protection and Radiation Safety* ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16), secondary legislation and findings of regular inspection controls (supervision). This also includes the keeping of sources in safe and secure conditions, thus ensuring that doses for workers and the general public are kept below established limits (in accordance with ICRP recommendations and EU directives).

The unique facility in Montenegro working with open radiation sources is the Nuclear Medicine Department of the Clinical Centre of Montenegro (CCM). However, this Department currently operates only with ^{99m}Tc, which, due to its physical characteristics, primarily its half-life, does not represent significant threat.

The discharge limits for the purpose of keeping the radiation exposure as low as reasonably possible are given in Rulebooks of 2011, which regulate radioactive waste management issues.

As far as the radioactive waste central storage facility is concerned, it is important to underline that, according to the provisions of the Rulebook on detailed conditions for obtaining the license for radioactive waste storage management, the Centre for Eco-Toxicological Research CETI had the obligation to submit, among other things, the Report on results of radioactivity monitoring before the commissioning of the storage facility, provided that the radioactivity monitoring was to be carried out by a company outside of Montenegro. Such request of the Nature and Environmental Protection Agency was based on the fact that CETI is the only entity in Montenegro authorized to conduct radioactivity monitoring.

Regarding the provision of operational ionizing radiation protection measures, mandatory part of the documentation necessary for issuing the license for radioactive waste storage management is **the Safety Report**. Extracts from the contents of the Safety Report, as the most comprehensive document, are given in **Section 7.3 Article 23: Quality Assurance**.

Based on estimations and calculations, the LLC „Centre for Ecotoxicological Research" CETI, which manages the radioactive waste storage, has set dose limits for dose burden of workers and visitors for the storage, which are presented in the Instructions on Entering, Leaving and Staying in the storage in Podgorica (LAB-RAO – 01). Operational threshold annual effective doses for workers in normal operation equals 10 mSv/year, for visitors of the storage 3 μSv per visit (with annual maximum of 0.1mSv). The dose constraints for the most exposed individuals amongst the population is 0,1 mSv/year.

All workers performing activities in the storage, as well as visitors, are continuously monitored in accordance with procedures of radiological protection of employees in the storage. Records are kept about all entries in the controlled area, which are used for immediate control of the dose received by individuals as defined by the **Instructions on Entering, Leaving and Staying in the RAW storage in Podgorica** (LAB-RAO – 01).

All dose limits are below the internationally accepted and recommended limits with a goal to ensuring that radiological burden resulting from working or staying in the storage is as low as possible and significantly lower than internationally accepted, and the ones prescribed by the Rulebook on ionizing radiation exposure limits („Official Gazette of FRY", No. 32/98) (1 mSv/year for the population and 20 mSv/year for occupationally exposed persons).

Pursuant to Article 9 of the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16), the Nature and Environmental Protection Agency prepares proposal of annual Programme of systematic examination of radioactivity in the environment, which is adopted by the Government of Montenegro on the proposal of the Ministry of Sustainable Development and Tourism. The Programme of systematic examination of radioactivity in the environment, which has been performed since 1999, is performed to establish presence of radionuclide in the environment and assess the level of exposure of the population to ionizing radiation in normal conditions, and in case of suspected radiation accident and during radiation accident.

The programme is prepared in accordance with the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16), Decision on systematic examination of the radionuclide contents in the environment ("Official Gazette of the FRY", No. 45/97), Rulebook on the limits of radioactive contamination of the environment and decontamination procedures ("Official Gazette of the Federal Republic of Yugoslavia", No. 9/99), Rulebook on the limits of exposure to ionizing radiation ("Official Gazette of the FRY", No. 32/98), Rulebook on conditions to be fulfilled by legal entities for performing systematic examination of radionuclide in the environment ("Official Gazette of the FRY", No. 32/98) and the Rulebook on intervention and derived intervention levels and measures of protection of the population, domestic animals and agriculture (veterinary medicine, crop production and water management) in case of emergency ("Official Gazette of the FRY", No. 18/92 and "Official Gazette of Serbia and Montenegro" 1/2003 - Constitutional Charter). The systematic examination of radionuclide is performed in: the air, soil, rivers, lakes and the sea, solid and liquid precipitation, construction material, drinking water, foodstaff and feedstaff, general use products. In addition, measuring includes intensity of absorbed dose of gamma (γ) radiation in the air and the level of radon exposure in residential areas and workplaces are examined. The methods of measuring specific activities of radionuclide in samples from the environment include: gamma (γ) spectrometry, measuring total alpha (α) and beta (β) by gas proportional counter and measuring of Sr-90 by radiochemical separation by liquid scintillation counter, which are compliant with applicable methods and recommendations of the IAEA. The programme of systematic examination of radioactivity in the environment establishes places, time intervals, types and methods of systematic examination of radioactivity in the environment. Since it is impossible to plan places, time intervals, types and methods of systematic examination of radioactivity in the environment in case of suspected radiation accident and during radiation accident, certain funds are planned in this case for extraordinary radioactivity monitoring.

Costs of radioactivity monitoring (regular and extraordinary) and assessment of the level of exposure of the population to ionizing radiation are covered from the Budget of Montenegro. A legal entity that the Nature and Environmental Protection Agency selects through public tender launched under the Law on Public Procurement ("Official Gazette of Montenegro", No. 42/11, 57/14, 28/15, 42/17) implements the Programme of systematic examination of radioactivity in the environment and is obliged to submit to the Agency the Report on monitoring radioactivity in the environment until 1 March of the current year for the previous year. In case of radiation accident, the legal entity is obliged to immediately notify the Agency. After that, the Nature and Environmental Protection Agency prepares consolidated Information about the environment condition with Proposal of measures for mitigating negative environmental impact, which includes other segments of the environment, which is adopted by the Government of Montenegro on the proposal from the Ministry of Sustainable Development and Tourism. On the basis of the Conclusion of the Government of Montenegro, the Ministry of Sustainable Development and Tourism informs the Government about implemented activities.

Pursuant to the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for the period 2017-2021, in 2019/2020, the Ministry of Sustainable Development and Tourism conducted an **open public procurement procedure for the development of the Analysis of monitoring of radioactivity in drinking water throughout Montenegro** needed for preparation of bylaws related to the testing of radioactivity in drinking water. Measurements included water sampling from 68 water sources in Montenegro in

which the following parameters were analyzed: radon in drinking water, tritium in drinking water and gross alpha and gross beta activity in drinking water.

It is also very important to point out that measurements of radon concentration in workplaces, such as radioactive waste storage, are performed. The Government of Montenegro, at the proposal of the Ministry of Sustainable Development and Tourism, at the session held on 20 December 2018 adopted the Radon Protection Program with the Action Plan for the period 2019-2023. The Program provided guidelines that are standardized within the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security. Within the Proposal of the Law, emphasis was given to all workplaces where increased exposure to natural sources of ionizing radiation can be expected, as well as workplaces where there is a possibility of increased exposure to radon. It is important to point out that the Radon Protection Program has provided guidelines for the legal provisions for national reference levels of radon activity concentration for existing and new dwellings and workplaces, urgent action level of radon activity concentration, as well as to legally regulate radon prone areas. Taking into account national reference levels, as well as the effective doses that person can receive in workplaces or in dwellings, protective measures are defined. In order to implement protective measures and reduce the activity concentration of radon in dwellings, in radon prone areas, as well as in other areas, the participation of local governments is emphasized, which are obliged to develop and implement local action plans for radon protection within the prescribed deadlines. Regarding workplaces, it is defined where it is mandatory to measure the radon activity concentration.

Special progress in the legal framework has been made with the adoption of the **Law on Spatial Planning and and Construction of Structures** („Official Gazette of Montenegro“, No. 064/17), which, among other things, **regulates the protection against radioactive radon gas in the design phase and construction of facilities, as a preventive measure**. In this way, alignment was performed, both with national needs and specifics, and with part of the provision related to protection against radon from Council Directive 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/EURATOM and 2003/122/Euratom.

7.5 Article 25: Emergency Preparedness

„Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested at an appropriate frequency.
Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory that may be affected by a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.“

Pursuant to the Decree on the organization and the method of work of State Administration (“Official Gazette of Montenegro”, No. 087/18, 002/19, 038/19, 18/20) and the Law on Protection and Rescue (“Official Gazette of Montenegro”, No. 13/07, 5/08, 86/09, 32/11, 54/16), the Ministry of the Interior is a part of the Public Administration which is competent, among other things, for development, adoption,

implementation and update of national plans for any type of hazards (including nuclear and radiological hazards). At the proposal of the Ministry of Internal Affairs, the Government of Montenegro at the session held on 21 December 2017 has adopted the Strategy for Disaster Risk Reduction with the Dynamic Action Plan for the implementation of the Strategy for the period 2018-2023.

The Strategy, whose development was coordinated by the Ministry of the Internal Affairs (Directorate for Emergency Situations), was developed by a multi-sectoral working group composed of representatives of relevant institutions. The strategy aims at reducing and preventing the occurrence of new risks, strengthening the capacities of society and state institutions in response to various types of natural and technical technological hazards.

The main objectives of this Strategy are: raising citizens' awareness and encouraging institutions to carry out activities in the field of disaster risk reduction; strengthening the capacity to manage risks from natural and other disasters; integrating disaster risk reduction in policies, programs and plans, and creating safe and resilien communities. The Strategy specifically addresses nuclear and radiation accidents.

Pursuant to the Law on Protection and Rescue ("Official Gazette of Montenegro", No. 13/07, 5/08, 86/09, 32/11, 54/16) protection and rescue plans are developed at the three following levels: **national, municipal and entrepreneurial**. Plans at the local level (municipal and entrepreneurial) must be harmonized with the National Action Plan in case of a Radiation Accident Plan, which is verified by issuing of approval by the Ministry of Interior (Directorate for Emergency Situations).

The **National Action Plan in case of a Radiation Accident** was developed and adopted by the Ministry of the Internal Affairs in March 2010, in accordance with the IAEA methodology and recommendations and in cooperation with experts of all competent institutions of Montenegro.

The Ministry of Internal Affairs coordinates implementation of the National Plan of Action in Case of a Radiation Accident through the Coordination Team, headed by the Prime Minister of Montenegro (members of the Coordination Team for Protection and Rescue were appointed by a Decision, adopted at the session of the Government of Montenegro on 27 July 2017).

Operational coordination of the response to the radiation and nuclear accident is done by calling the **Operational Headquarters for Protection and Rescue**, which includes representatives of relevant ministries, state bodies and state administration bodies appointed by the Government. (At the session held on 27 July 2017, the Government of Montenegro adopted the Decision on the appointment of members of the Operational Headquarters for Protection and Rescue ("Official Gazette of Montenegro", No. 13/07, 32/11, 54/16)).

The territory of the municipality in case of emergencies caused by excessive radiation is managed by the Municipal Team for Protection and Rescue, which consists of the mayor who is the team leader; Commander of the Protection Service who is the Deputy Team Leader and members: a representative of the organizational unit of the Ministry responsible for protection and rescue, heads of local government bodies, responsible persons in companies and other entities whose activities are related to protection and rescue from radiation and nuclear risks, as well as representative of the Red Cross. Elders and representatives of other municipal bodies, representatives of other organizations and institutions, as well as experts in the field of protection and rescue can participate in the work of the Municipal Team, upon invitation.

Holders of licenses for performing radiation activity and of the license for radioactive waste storage management, pursuant to the provisions of the Law on Protection and Rescue and the Law on Ionizing Radiation Protection and Radiation Safety, must have in place adequate action plans in case of emergency. Approval of plans is given by the Ministry of the Interior (Directorate for Emergency Situations), and it is submitted to the Nature and Environmental Protection Agency for the purpose of license issuing.

The National Action Plan in Case of a Radiation Accident provides a good insight into the preparedness and responses for all aspects caused by emergency situations due to excessive radiation. This plan is updated together with other protection and rescue plans with the most recent events and information. The aim of the National Action Plan in Case of a Radiation Accident is to analyse the existing and future radiation and nuclear risks, establish the concept of organized action of state and other institutions in case of radiation and nuclear accident, prevent accidents applying preventive actions, mitigation of consequences, as well as the development of adequate state capacities and the overall social community in case of their occurrence in a closer and more distant future.

In the Strategy for Disaster Risk Reduction with Dynamic Action Plan to implement the Strategy for the period 2018–2023, in the chapter 3.2 "Nuclear and radiation accidents" is stated that Montenegro is surrounded by nuclear power plants from Slovenia, Hungary, Bulgaria, Slovakia, etc. and may be threatened by transnational discharges. Within a radius of 600 km around the territory of Montenegro there are three nuclear power plants: Krško in Slovenia (one reactor with 696 MW of electrical power), Paks in Hungary (4 reactors, each with 475 MW of electrical power) and Kozloduy in Bulgaria (2 reactors, each with 1000 MW of electrical power). In addition, several other nuclear power plants are within 1,000 km of our country, which means that Montenegro may be affected by a cross-border nuclear accident. However, from an accident response planning point of view, nuclear power plants located at distances of less than 300 km are particularly significant. The area within a radius of 300 km from nuclear power plants is the zone of application of protection measures in agriculture and in the restriction of the use of goods and foodstuffs. The National Action Plan in Case of a Radiation Accident, in which the previous IAEA standard GS-R-2 "Preparedness and Response for a Nuclear or Radiological Emergency" has been implemented, covers III, IV and V threat categories.

The National Plan addresses obvious, as well as potential radiation risks and covers the following categories of threats:

- **Threats of III category** are events inside the facility (i.e. events requesting an urgent preventive action within the facility, but not likely to cause negative effects outside the facility; among other things, these are facilities (devices) where, in case of loss of protection, the external dose does not exceeds 100 mGy/h at a distance of 1m);

- **Threats of category IV** (external dose exceeding 100 mGy/h at a distance of 1m). These events are events that may require implementation of protection measures and activities on an unforeseeable location, especially during the transport and displacement of hazardous sources, such as radiographic radioactive sources, satellites with hazardous sources, waste iron treatment plants for, sources used in measuring and processing techniques…);

- **Threats of category V** (widespread contamination derived from categories I or II, facilities, from abroad).

With regard to Category V, the National Plan describes a case of widespread contamination from Category I and II facilities from abroad. In this case, radionuclide deposition can lead to overdoses and the application of protective actions (generic intervention levels GIL) and ingestion (generic action levels GAL) at large distances from Category I and II facilities. The main focus is on controlling food, groceries and other products and conducting emergency environmental monitoring. In the case of broad-scale contamination, the population will receive information on the facts and measures which needs to be taken by the media (TV, Radio, newspapers pursuant to Directive 59/2013 (formerly 89/618/Euratom)). The announcements will be prepared by the Operational Headquarters - Directorate for Emergency Situations of the Ministry of the Interior in coordination with the Nature and Environmental Protection Agency and the Ministry of Sustainable Development and Tourism, based on collected data from the teams conducting radiation monitoring.

Also, the National Plan of Action in Case of a Radiological Accident describes a case of importing contaminated food or material. Contaminated foods may cause generic action levels (GAL) to be exceeded for food use restrictions. The uncontrolled or unknown use of contaminated iron (steel) and other products can lead to doses that exceed professional limits. Accidental inclusion of abandoned sources in scrap metal can lead to significant adverse public reactions and consequences for the economy. In coordination with relevant institutions (Customs Directorate, Police Directorate, Ministry of Agriculture and Rural Development, Administration for Food Safety, Veterinary and Phytosanitary Affairs, Ministry of Health, Institute of Public Health, etc.), the population will receive information on possible restriction of food and other foodstuff and products and the measures which needs to be taken.

Montenegro will have the opportunity to reconsider all scenarios while updating the National Plan of Action in Case of a Radiological Accident, in order to implement the recommendations given in the IAEA standard GSR Part 7 "Preparedness and Response for a Nuclear or Radiological Emergency".

In the forthcoming period, Montenegro will start drafting the National Disaster Risk Assessment and, among other risks (floods, fires, earthquakes, technical and technological risks) nuclear-radiation risks will be assessed.

The National Plan also includes provisions giving the possibility for expert assistance to threatened institutions-organizations. The events of special interest, described in the National Plan, also include any such event related to nuclear-powered vessels or detonation of radiological dispersal devices – dirty bombs (RDD).

Based on the Law on Protection and Rescue ("Official Gazette of Montenegro", No. 013/07, 005/08, 086/09, 032/11, 054/16), the Ministry of Internal Affairs through a single – Operational Communication Center (OCC 112) receives calls regarding the imminent threat of risk and the occurrence of risks, collects information on all types of risks that may endanger humans, tangible and cultural goods and the environment and through means of communication, in accordance with standard operating procedures, urgently informs the competent state authorities, state administration bodies and municipal authorities and other participants of protection and rescue and coordinates the action during the emergency upon the call.

Also, pursuant to the Law on Protection against Ionizing Radiation and Radiation Safety ("Official Gazette of Montenegro", No. 056/09, 058/09, 040/11, 055/16), anyone who becomes aware of the danger of increased exposure to ionizing radiation of population and environment on the territory of Montenegro or some other state is

obliged to inform, without delay, the Ministry of the Interior - Directorate for Emergency Situations and the Nature and Environmental Protection Agency. Pursuant to the provisions of the aforementioned laws and the National Plan, the Ministry of the Interior, through the Directorate for Emergency Situation, and the Nature and Environmental Protection Agency, are institutions that will be first notifed about the increased radiation level and take all necessary measures and actions in accordance with their competencies to respond adequately to the the situation, in the manner described.

When it comes to radioactive waste management, it is important to point out that the Integral part of the Safety Report, which is a condition for obtaining a license to operate a radioactive waste storage facility, is also a consideration - **storage safety analysis from the aspect of assessing the probability of different types of hazards**. Some of the reviewed events include:

- spilling of liquid in the storage;
- explosion in the storage;
- explosion in the immediate surrounding of the storage;
- flood (raising of ground waters, high precipitation, flood caused by water courses);
- earthquake;
- fall of an aircraft on the storage;
- terrorist attack on the storage;
- fire in the storage;
- radiological impact of the storage;
- external radiation during normal operation of the storage;
- precipitation outflows during normal operation of the storage;
- dissipation of solid radioactive waste at handling;
- direct radiation with radioactive waste;
- direct contact with radioactive waste;
- fall of a vessel with radioactive waste.

Consideration was given to hypothetical scenarios of accidents with different types of radiation sources – radioactive waste that is located or may be located in the storage, for instance 137Cs; 60Co; 241Am; 226Ra; 238U and all the analysis are presented in the Safety Report. Also, there is a whole set of accompanying documents, procedures, plans of action etc., and the entire set of these documents is approved by relevant state institutions such as the Agency, Ministry, Directorate for Emergency Situations and most of these documents are classified as secret in accordance with provisions of corresponding laws which regulate facilities of special interest in Montenegro, and actions are taken accordingly.

In addition to the Strategy for Disaster Risk Reduction with a Dynamic plan of activities for the implementation of the Strategy for the period 2018-2023 and the Law on Protection and Rescue ("Official Gazette of Montenegro", No. 13/07, 05/08, 86/09, 32/11, 54/16), the following secondary legislation were also adopted:

- Rulebook on the content and methodology of preparation, method of harmonization, updating and keeping studies of risk assessment on the basis of which protection and rescue plans are drawn up ("Official Gazette of Montenegro", No. 31/17);

- Rulebook on the Detailed Content and Methodology of Drafting, Method of Harmonizing, Updating and Keeping Protection and Rescue Plans ("Official Gazette of Montenegro", No. 34/17).

In addition to the Law on Protection and Rescue ("Official Gazette of Montenegro", No. 13/07, 05/08, 86/09, 32/11, 54/16), which constitutes a general legal framework for dealing with a natural disaster, technical and technological accidents and other accidents, there are other laws for which the area of protection and rescue is not the primary competence, but indirectly regulated certain issues that are important for this area. This applies in particular to: Law on the Environment ("Official Gazette of Montenegro", No. 52/16), Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16), Law on Waters ("Official Gazette of the Republic of Montenegro", No. 27/07, and "Official Gazette of Montenegro", No. 32/11, 48/15, 52/16), Law on Hydro-Meteorological affairs ("Official Gazette of Montenegro", No. 26/10, 30/12), Law on Forests ("Official Gazette of Montenegro", No. 74/10, 40/11, 47/15), Law on Foreign Trade in Arms and Military Equipment ("Official Gazette of Montenegro", No. 40/16), Law on Spatial Planning and Construction of Structures ("Official Gazette of Montenegro", No. 64/17), Law on Occupational Safety and Health ("Official Gazette of Montenegro", No. 34/14), Law on the Red Cross of Montenegro ("Official Gazette of the Republic of Montenegro", No. 28/06), etc.

For the protection and rescue system it is important the implementation of the National Sustainable Development Strategy until 2030 (NSDS), which is Montenegro's long-term development strategy defining solutions for the sustainable management of four groups of national resources: human, social, natural and economic, as a priority overall sustainable development of Montenegrin society.

The provision of Article 35 of the Law on Ionizing Radiation Protection and Radiation Safety ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) defines obligation of establishing early notification system for radiation accident which may lead to the state of emergency, which threatens or may threaten the territory of Montenegro. In the period 4-8 July 2016 in Montenegro a network of six GDR stations were installed in the territory of the municipalities of: Pljevlja, Nikšić, Berane, Herceg Novi, Bar and in the territory of the Capital Podgorica, for which the Nature and Environmental Protection Agency had selected appropriate locations, in cooperation with representatives of municipalities, Capital Podgorica and the Institute of Hydrometeorology and Seismology.

Montenegro has decided to replace the ARGOS system with the JRODOS system, which installation and trainings will implement together with other countries in the Western Balkans.

At the beginning of 2020, the implementation of a multi-beneficiary IPA project of the European Commission JRODOS (Real time on line decision support) „EuropeAid/140203/DH/SER/MULTI - „Strengthening the Capacity of the Western Balkans for Radiological and Nuclear Emergency Preparedness and Response: Technical Support for Decision Making" has started. Apart from Montenegro, the beneficiaries of this project are: Albania, Bosnia and Herzegovina, Kosovo (according to UNSCR 1244/1999), Northern Macedonia and Serbia. The Implementing Agency is a Consortium chaired by ENCO from Austria and project beneficiaries are

representatives of the competent institutions of the Western Balkan countries in the field of ionizing radiation protection, radiation and nuclear safety and security.

Representatives of the Ministry of Interior, the Ministry of Sustainable Development and Tourism, the Institute of Hydrometeorology and Seismology and the Nature and Environmental Protection Agency are beneficiaries on behalf of Montenegro. The aim of the project is to establish a risk assessment system through the RODOS platform, which will help Montenegro to monitor the situation and make decisions in case of radiological or nuclear emergency.

With this project, in addition to the procurement of the JRODOS system, Montenegro will try to connect the existing early warning system, ie all six (6) GDR stations with it, i.e. it will use data from the station network. This will allow the RODOS system to be able to automatically use, at any time, the early warning system data it needs, to model, together with available meteorological data, any dispersion of radioactivity that may occur in the event of a nuclear accident.

It should be emphasized that the Parliament of Montenegro adopted the the Law on Ratification of the Agreement between the European Atomic Energy Community (EURATOM) and non-member States of the European Union on the participation of the latter in the Community arrangements for the early exchange of information in the event of radiological emergency (ECURIE) ("Official of Montenegro - International Treaties ", No. 002/17), after which Montenegro joined the ECURIE platform through the nomination of a national contact point (OCC 112), a national correspondent (MSDT) and a national competent institution (MSDT).

Also, Montenegro is part of the International Nuclear Event Scale (INES), the Unified System of Information Exchange in Incidents and Emergencies (USIE) for early warning of incidents that include radioactive sources with potential transboundary impact.

In line with foreign policy priorities, Montenegro is strongly committed to maintaining international peace and security, combating organized crime, terrorism and the proliferation of weapons of mass destruction (WMD). This commitment has been recognized in numerous strategic documents, the Defense Strategy, the National Security Strategy, the Strategy for the Prevention and Suppression of Terrorism, Money Laundering and Terrorism Financing and in the Non-Proliferation Strategy of weapons of mass destruction (WMD), thereby translating foreign policy priorities into strategic commitments. As a Party of almost all the major international legal instruments in the field of preventing the spread of WMD, Montenegro is committed to fulfilling the obligations arising from them. Among other things, an appropriate normative - legal and institutional framework aimed at preventing unauthorized persons from owning, producing, transporting or using any type of WMD, or the means to deliver them, has been established. In addition, any activity that may contribute to the proliferation of WMD is prohibited and an effective system of control of foreign trade in arms, military equipment and dual-use goods has been established.

Following the adoption of the Action Plan for the Implementation of UN Security Council Resolution 1540, which aims to prevent the WMD from taking possession of unauthorized persons, primarily terrorists, for the 2014-2018 period, in January 2015, the National Coordination Body for the implementation of the Action Plan was established. The work of the mentioned body was coordinated by the Ministry of Foreign Affairs. In May 2016, the Action Plan for the Protection against Chemical, Biological, Radiological and Nuclear Threats and Risks (CBRN) for the period 2016-2020

was adopted, which together with the Action Plan for Resolution 1540 provides an effective basis for the prevention and suppression of the spread of WMD, as well as for responding to potential CBRN accidents.

Montenegro is also a Party of the Hague Code of Conduct for Ballistic Missile Proliferation (HCOC); Global Nuclear Terrorism Initiatives (GICNT); Proliferation Security Initiatives (PSIs) and the International Partnership against Impunity for the Use of Chemical Weapons. Montenegro applied for membership in the Vasenar Arrangement on Conventional Arms Export Control.

In addition, Montenegro is a Party to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (BTWC) and the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (CWC).

In September 2016, the Government of Montenegro adopted the WMD Non-Proliferation Strategy for the period 2016-2020. The overall objective of the Strategy is to prevent Montenegro from participating in the dissemination of the WMD, and it is envisaged that this objective will be achieved through the implementation of individual activities: preventing the illegal development, procurement, production, trade and use of the WMD; strengthening prevention; a preparedness to respond quickly and effectively to a possible crisis and to strengthen international cooperation, each of which contains measures for implementation. With the adoption of the Strategy, the national framework has been completed, ie the necessary components have been completed and the conditions for successful coping with the proliferation of WMD have been created, so the emphasis is now on their comprehensive implementation.

The Action Plan for the implementation of the Strategy, adopted by the Government of Montenegro at its session held in June 2017, is based on the Action Plan for the Implementation of UN Security Council Resolution 1540, as well as on the CBRN Action Plan. The National Coordination Body for the WMD Non-Proliferation Strategy, established by the Government of Montenegro, at its session held in July 2017, is in charge to monitor the implementation of the WMD Strategy and the Action Plan for its implementation, the 1540 Action Plan and the CBRN Action Plan.

In order to streamline national architecture and its efficience, the WMO National Non-Proliferation Coordinating Body has replaced the National Coordinating Body to monitor the implementation of the UN Security Council Resolution Action Plan for 1540, as well as the National Implementation Team of the the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (CWC).

In addition to the 1540 Action Plan and the Chemical Weapons Convention, the National WMD Non-Proliferation Body has expanded the scope of competencies to cover the implementation of the CBRN Action Plan, the Action Plan for Strategy Implementation, as well as activities and obligations under the BWC, the Nuclear Non-Proliferation Treaty (NPT), and other numerous commitments arising from this domain (Montenegro is a member and actively participates in the international initiatives for non-proliferation of WMD), for which there are no established bodies responsible for implementation monitoring.

Guide for actions in case of accidents with dangerous material [1] has been prepared for members of services who **respond first to accidents**. The instructions provided in the Guide include lists of dangerous material of the most recent recommendations of the United Nations, and of other national and international regulations. The Guide is primarily intended as assistance to those arriving first to the place of accident to be able to identify quickly specific threats imposed by particular substances and protect themselves and other citizens in the initial phase of such incident. Also, Instructions provide general information about public security measures in a particular situation, as well as information concerning emergency isolation at the place of incident. They also list special precautionary measures in case of an incident involving fire, leakage of or exposure to chemical or radioactive material. The agreements signed in the field of protection and rescue against natural and other disasters contribute to and facilitate substantially the cooperation with countries in the region and beyond in case of a disaster.

One of the most important activities of the Ministry of Interior - Directorate for Emergency Situations in the reporting period was t**he establishment of the National Platform for Disaster Risk Reduction**, as a standing forum for exchange of opinions, expressing views, giving proposals and presenting achievements that contribute to minimizing risks of disasters in all areas of human activity. The Government of Montenegro adopted the **Decision on establishment of the Committee for Disaster Risk Reduction** at the session held on 9 October 2014 ("Official Gazette of Montenegro", No. 49/14). The Committee for Disaster Risk Reduction consists of 17 members from all relevant fields. The Disaster Risk Reduction Committee organizes Conferences to exchange opinions, present and harmonize views, proposals, knowledge and experiences for action on disaster risk reduction, as well as risk assessment and coordination of activities of all entities involved in threat and risk reduction action. The Decision stipulates that, in addition to members of the Committee, representatives of state bodies, state administration bodies and institutions, universities, companies, non-governmental organizations and other entities dealing with disaster protection and environmental protection may participate in the work of the conference.

The first conference for the establishment of the National Platform was held on 16 December 2014 in the organization of the Disaster Preparedness and Prevention Initiative for South Eastern Europe (DPPI SEE). **The Second Conference of the National Platform for Disaster Risk Reduction** was held on 26 November 2015, with the theme of floods, and gathered about 70 participants from different structures of the protection and rescue system from Montenegro and abroad.

By holding the **Third Conference of the National Platform for Disaster Risk Reduction**, Montenegro continued to work continuously on disaster risk reduction (in this case the flood, 23 June 23 2016). **The Fourth Conference of the National Platform for Disaster Risk Reduction** was held on 20 December 2017 with the theme of outdoor and indoor fires and on during that occasion a Proceedings was printed.

The Fifth Conference of the National Platform for Disaster Risk Reduction was organized by the Committee on Disaster Risk Reduction on June 28-29, 2018 in Kolasin,

[1] According to Article 37 of the Protection and Rescue Act, the Directorate for Emergency Situations of the Ministry of Interior establishes programmes for equipment and development of the protection and rescue system in Montenegro, gives instructions for management in protection and rescue and proposes measures to those participating in protection and rescue.

during which a new **Strategy for Disaster Risk Reduction with the Dynamic Plan of Activities for the Implementation of the Strategy for the period 2018-2023** was presented. The platform brought together a large number of representatives of different structures of the protection and rescue system in Montenegro, state bodies, state and local self-government bodies, scientific and academic community, private companies and enterprises, non-governmental organizations, local communities, international and regional organizations, as well as numerous media representatives. Through numerous presentations and panel discussions, the Strategy for Disaster Risk Reduction with the Dynamic Plan of Activities for the Implementation of the Strategy for the period 2018-2023 was presented. The last Fifth Conference analyzed in detail the commitment to the priorities and global goals identified by the **Sendai Disaster Risk Reduction Framework (2015-2030)** as well as the implementation of the most important activities in the field of disaster risk reduction at national and local levels, by developing: local disaster risk reduction strategies; national disaster risk assessments; local disaster risk assessments; national protection and rescue plans for different types of risks; local protection and rescue plans for different types of risks, and by establishing an adequate legal framework in the area of disaster risk reduction at national and local level and continuing education and raising the level of knowledge in the field of disaster risk reduction through the implementation of the Cross Curriculum Programme in the field of risk reduction catastrophes, etc. The first Action Plan for the implementation of the Disaster Risk Reduction Strategy for 2018/2019 was also presented. Also, opinions, information, experiences and best practices were exchanged between participants in risk management in Montenegro, the region and countries of the European Union. The experiences and models of bilateral, regional and international cooperation in disaster risk reduction have been analyzed. One of the very important topics is the role of the media in the occurrence of different types of disasters. Therefore, by holding the Fifth Conference of the National Platform for Disaster Risk Reduction, Montenegro continued to continuously work on the implementation of the strategic priorities and objectives of the Sendai Disaster Risk Reduction Framework (2015-2030).

On November 14 and 15 2019, a Conference on **"Disaster Risk Reduction and the Importance of Cross-Border and Regional Cooperation"** was held in Podgorica, with the aim of exchanging experiences, opinions, models of good practice and lessons learned when it comes to risk reduction from disasters, as well as the contribution to informing the population and special target groups about this area and the importance of international cooperation.

So far, the Government of Montenegro has adopted **two Action Plans for the implementation of the Strategy for Disaster Risk Reduction** for the period 2018/2019 and for the period 2020/2021 years.

7.5.1 Information of the public and neighbouring States

Montenegro has a system in place for informing the public and neighbouring countries in the case of a nuclear accident. A detailed description of responsibilities and manner of management is provided in the National Plan of Action in the Case of a Radiation Accident.

Also, as a contracting party to the Convention on Environmental Impact Assessment in a Transboundary Context (ESPOO Convention) and the Protocol on Strategic

Environmental Impact Assessment in a Transboundary Context (SEA Protocol) and the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Issues (Aarhus Convention), Montenegro is exchanging information with neighbouring countries whose installations might have environmental impact in a transboundary context.

Regarding international legal instruments in this area, it is important to point out that Montenegro is also a Contracting Party to the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and the Agreement between the European Atomic Energy Community (EURATOM) and non-member States of the European Union on the participation of the latter in the Community arrangements for the early exchange of information in the event of radiological emergency (ECURIE).

Montenegro participates with its representatives in platforms of the International Nuclear and Radiological Event Scale (INES) and in the Unified System for Information Exchange in Incidents and Emergencies for early notification of incidents involving radioactive sources with potential transboundary impacts (USIE). In addition, Montenegro has been a member of the Incident and Trafficking in Nuclear and Radioactive Material (ITDB) database since 2006. The ECURIE platform will be used to inform the population and the surrounding countries, especially the member states of the European Union.

Ratified agreements in the field of protection and rescue from natural and other disasters significantly contribute to and facilitate cooperation with countries in the region and beyond, in the event of disasters. In this regard, Montenegro is Contracting Party and Signatory to **21 agreements and memorandums in the field of protection and rescue from natural and other disasters listed in the Annex 3.**

7.5.2 Participation in exercises

The Ministry of the Interior (Directorate for Emergency Situations) participates every year in exercises during which tests capacities for preparedness and response to emergencies in the country and in the region. Annual programme contains types of exercises, goals and participants.

In the period 31 October – 4 November 2016, a NATO field exercise "Montenegro 2016" was organized in Montenegro, with a scenario in response to floods and a chemical, biological, radiological and nuclear (CBRN) incident.

The exercise "MONTENEGRO 2016" was attended by about 680 participants from 32 countries, namely NATO and partner countries. In addition to 17 international rescue teams, representatives of the following countries took part in the exercise: Albania, Austria, Azerbaijan, Belgium, Bulgaria, Bosnia and Herzegovina, Czech Republic, Denmark, Finland, France, Georgia, and the Netherlands. In addition to the teams, 39 observers from 22 NATO or Partner countries, as well as from European Union countries, participated. NATO EADRCC International Field Exercise "MONTENEGRO 2016" was the sixteenth field exercise organized by the Euro-Atlantic Disaster Response Coordination Center (EADRCC) since 2000 and the first to be held in our country. The overall organization of the international field exercise "MONTENEGRO 2016" was evaluated, by all participants of the exercise, as very successful. The organization of this

exercise enabled Montenegro to reaffirm its willingness to promote the value and importance of joint regional association in responding to different types of hazards.

In the period from 2015 to 2018, the Ministry of the Interior (Directorate for Emergency Situations) implemented the project "Strengthening CBRN first response capabilities and regional cooperation of the countries of South East Europe, Southern Caucasus, Moldova and Ukraine". Project 44 was implemented by a Consortium consisting of: the Belgian Nuclear Research Institute (CSK-CEN), the Slovak First Response Institute (ISEMI), the Dutch National Institute of Public Health and the Environment (RIVM), the Polish Institute of Organic Chemistry (IPO) and the Belgian Institute for Radiolements (IRE). The partners in this project are the Interregional Crime and Justice Research Institute (UNICRI) and the Regional Secretariat for Center of Excellence (COE).

The beneficiary countries of the project were: Albania, Bosnia and Herzegovina, Montenegro, Serbia, Northern Macedonia, Armenia, Moldova and Ukraine, as well as the Caucasus region. The aim of the project was to identify deficiencies in CBRN accident-incident response services, to test national and regional response procedures, to strengthen interagency and regional cooperation among beneficiary countries, and to test the knowledge and skills of first responders in the CBRN. The project has donated equipment for one rescue team of the Podgorica Capital Protection Service, and four (4) CBRN scenario exercises has been held, with the aim of testing procedures and response capacities, interagency and interregional cooperation, that is, testing communication, coordination and adoption national and international decision making.

In the period 5-6 December 2016 in Podgorica, a table top exercise TTX was held with the purpose of testing interagency cooperation, as well as procedures for response in case of accidents during the transport of radioactive material. This exercise was attended by national institutions responsible for responding to CBRN incidents/ accidents.

Exercise "CBRN LAZINE 2017, was held on 26-27 May 2017 during which the National Response Team in case of CBRN accident and representatives of the Directorate for Emergency Situations, Center for Ecotoxicological Research, Nature and Environmental Protection Agency, Institute for Public Health, Institute for Hydrometeorology and Seismology, Red Cross of Montenegro, Police Directorate, Medical Center of Ministry of Interior and Protection and Rescue Services Podgorica and Danilovgrad were participated.
The exercise was implemented through the involvement of the Operational Communication Center OCC 112. The exercise utilized protection equipment in case of CBRN accident, which was donated within the project. The general conclusion of the exercise was that the state has shown that it has the capacity to respond to this type of accident, but that it should continue to strengthen the capacities of the competent institutions in the case of CBRN accidents, through the organization of training and procurement of adequate personal and collective equipment.

In the period 6-7 December 2017 the Regional Table Top Exercise was also held at the Directorate for Emergency Situations, in order to test the procedures for responding to a transnational accident, with the participation of the countries of the region that were also P44 beneficiaries (Serbia, Albania, Bosnia and Herzegovina and Northern Macedonia).

In the period 17-20 April 2018, a regional field exercise was held in Tirana, Albania, with the participation of the national CBRN team, members of the Capital Protection Service

and officials of the Ministry of the Interior (Directorate for Emergency Situations). The exercise was organized to test regional co-operation and coordination of bilateral agreements, border crossing procedures and to review EU guidelines for host country support, as well as to test the knowledge and skills of first responders in the event of a CBRN accident.

Training for trainers for the first response to the CBRN accident in the countries of Southeastern Europe ("Train-the-trainers and training activities on CBRN incident response for the countries in the Balkans") was implemented from 8 to 12 May 2017 in Budva, Montenegro. The training was attended by CBRN team members, representatives of the Ministry of the Interior (Directorate for Emergency Situations) and members of the protection and rescue services of the capital Podgorica, as well as representatives of other participating countries in the project.

CBRN Accident Training, held on 7 December 2017 was performed with a total of 20 members of the operational units for protection and rescue at the Police Academy in Danilovgrad. The aim was to get acquainted with the procedures and equipment for the detection of hazardous substances in case of CBRN accident, to get acquainted with the concept, significance, means and substances for CBNR decontamination, to get acquainted with the procedure after the end of decontamination for the preservation of health and the environment, and the protection measures for the safe operation of lifeguards. Special topics were covered: chemical, radiological-nuclear and biological accidents. During 2018 and 2019, ConvEx exercises (ConvEx 1 and ConvEx 2) were also conducted by the IAEA with Member States contact points using the USIE platform.

The first ECURIE Advisory Exercise in Montenegro “ECURIE EXERCISES ADVISORY” European Community Urgent Radiological Information Exchange - Emergency radiological emergency exchange platform conducted by EU Member States with European Union and non-EU Member States was held on 19 November 2018 at Podgorica. The ECURIE exercise with scenario of transnational incident with 137Cs was held with the participation of national contact points: representatives of the OCC 112 Operational Communication Center, Directorate for Emergency Situation of the Ministry of the Interior and representatives of the regulatory authority from the Ministry of Sustainable Development and Tourism. The purpose of the ECURIE exercise was to test the mutual communication of the national contact point for exchange of information, the competent institution, the national correspondent and the activation of arrangements for responding to transnational accidents (activation of bilateral and multilateral response arrangements) with the simultaneous participation of the countries participating in the ECURIE Agreement.

The general conclusion is that the exercise was successfully implemented. In addition to the aforementioned exercise for communication of contact points from Montenegro with the representatives of the European Commission, a “communication test” was conducted on 6 June 2019, while a one-day training for access to the ECURIE platform was held for the officers of the OCC 112 Operational Communication Center.

Montenegro will continue to participate in ECURIE exercises and other similar exercises organized by the International Atomic Energy Agency in order to enhance national emergency response capacities.

In the period 27-30 May 2019, the **Joint External Evaluation (JEE) of national capacites for preparedness and response** in the case of event that pose a potential threat to public health at the global level, regardless of the type and type of hazard, was

held in coordination by the Ministry of Health, Ministry of Internal Affairs - Directorate for Emergency Situations and the Institute of Public Health. Montenegro conducted a self-assessment of emergency preparedness and response capacity based on a tool developed by the World Health Organization (WHO) to assess capacity related to the International Health Regulations (IHR). The self-assessment examined 19 technical areas (including preparedness and response to chemical, biological and nuclear radiation threats and risks, emergency response operations, emergency management and coordination, etc.) and was presented to a multi-sectoral external assessment team, consisting of experts from Member States, WHO, FAO (Food and Agriculture Organization of the United Nations) and OIE (World Organization for Animal Health). **The country's capacities for preparedness and response** to radiological and nuclear threats and risks and best practices, as well as areas that need to be strengthened, **were noted.**

7.6 Article 26: Decommissioning

„ Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

(i) qualified staff and adequate financial resources are available;

(ii) the provisions of Article 24 with respect to protection against operational radiation, discharges and unplanned and uncontrolled releases are implemented;

(iii) the provisions of Article 2 with respect to emergency preparedness are implemented; and

(iv) records of information important for decommissioning are kept. “

Decommission is a very important stage in the life cycle of a radioactive waste storage and it needs to be planned so as to fulfil all requirements in order to protect human life and health and the environment.

As regards the national law, decommissioning is described in the definition of the Rulebook on methods of collecting, keeping, processing and storing of radioactive waste („Official Gazette of Montenegro“, No. 58/11), but only with regards to storing of radioactive waste, while provisions of the Rulebook on closer conditions for obtaining a license to manage radioactive waste storage („Official Gazette of Montenegro“, No. 56/11) provides that the method of decommissioning of the storage is an integral part of the Safety Report, which is submitted by the applicant in the process of obtaining a licence to manage radioactive waste storage.

In addition, decommissioning of a nuclear facility is also defined by the Decision on conditions for the location, construction, trial operation, commissioning, operation and decommissioning of a nuclear facility (“Official Gazette of the Federal Republic of Yugoslavia”, No. 42/97). However, the Law on Ionising Radiation Protection and Radiation Safety (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16) does not define a radioactive waste storage as a nuclear facility, because it is a radiation facility (building).

Due to the fact that the storage facility, which is for long-term management of radioactive waste, became operational on 13 June 2012, funds for cosure and decommissioning have not been allocated because such a norm is not prescribed within the existing legal framework. In this regard, it was necessary during the drafting of the new Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security to

define all the necessary provisions to guarantee certain financial resources for closure and decommissioning, as well as to define Decommissioning plan as condition for obtaining a permit for the management of radioactive waste storage.

For preparation of financial estimation for decommissioning of radioactive waste storage, the current holder of the license to manage radioactive waste storage, LLC "Centre for Ecotoxicological Research" CETI, needs to prepare a cost-benefit analysis. During preparation of this analysis and definition of legal standards, it is necessary, inter alia, to use the Commission Recommendation 2006/851/EURATOM of 24 October 2006 on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste, which focuses on adequate financing, financial security and transparency to ensure that funds are used only for the purpose for which they have been established.

For the purpose of improvement of the legal framework regarding decommissioning, the Ministry of Sustainable Development and Tourism has started activities related to the development of more detailed plans for decommissioning of radioactive waste storage faciity (central storage) and temporary storage (aircraft engine remnants) and in this regard implemented an expert Advisory Mission in the period 6-10 November 2017 within the regional project of technical cooperation with the IAEA. These activities were extremely important due to the establishment of legal norms for decommissioning plans within the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security. It is envisaged that the decommissioning plan is developed as an Initial and Final depending on the practice at the expense of the applicant for obtaining a certain license or registration, with the obligatory engagement of ionising radiation protection expert. The assessment of the Initial and Final Decommissioning Plan, which are regularly updated within certain deadlines, is prescribed to be performed by the Nature and Environmental Protection Agency when issuing licenses to perform practces and approvals for certain facilities. The Ministry of Sustainable Development and Tourism will draft a Rulebook prescribing the content of the initial and final decommissioning plan. The mission was dedicated to these tips for the development of decommissioning plans, both for the temporary facility (storage) and the central radioactive waste storage facility. The Rulebook will be drafted in accordance with the requirements of the IAEA standards for decommissioning of installations, the provisions of European Council Directives 2013/59/EURATOM, 2011/70/EURATOM, Commission Recommendation 2006/851/EURATOM of 24 October 2006 on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste, etc.

Having in mind the standard of the International Atomic Energy Agency GSR Part 6 "Decommissioning of Facilities", provisions of Article 28 of the Council of Europe Directive 2013/59/EURATOM laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/EURATOM, 90/641/EURATOM, 96/29/EURATOM, 97/43/EURATOM and 2003/122/EURATOM and provisions of Article 7 of the Council of Europe Directive 2011/70/EURATOM of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, the new Law on Ionising Radiation Protection, Radiation and Nuclear Safety and Security transposed provisions of relevant directives and international standards, and in that respect a separate rulebook be developed.

Therefore, in the reporting period, **significant progress was made** in drafting the legal framework, ie drafting a Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, which defines norms governing each step until the

closure of an installation and institutional monitoring thereafter. Thus, the standards covered the entire life cycle of a facility, the appropriate permits and licenses, and the manner of control of all activities undertaken. This is a major step forward comparing to the existing solution given in the above Decision.

This issue was especially emphasized in the framework of the Strategy for ionizing radiation protection, radiation safety and radioactive waste management for the period 2017-2021 with the Action Plan for the period 2017-2021.

It is important to point out that the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security elaborates all steps in detail, ie it tooks into account the interdependence of different steps in radioactive waste management and all actions taken for safe and secure radioactive waste management. IAEA publications were used on that occasion.

8 Section G: Safety of Spent Fuel Management

8.1 Articles 4-10

This Section containing Articles 4 - 10 does not apply to Montenegro.

9 Section H: Safety of Radioactive Waste Management

9.1 Article 11: General Safety Requirements

„Each Contracting Party shall take appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other risks.
To that effect, each Contracting Party shall take the appropriate steps to:

(i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;
(ii) ensure that the generation of radioactive waste is kept at the practical minimum.
(iii) take into account interdependencies among the different steps in radioactive waste management;
(iv) provide for effective protection of individuals, society and the environment, by applying, at the national level, suitable protective methods as approved by the regulatory body, in the framework of its national legislation which adequately reflects the internationally adopted criteria and standards;
(v) take into account the biological, chemical and other risks that may be associated with radioactive waste management;
(vi) strive to avoid activities that could have reasonably predictable impacts on future generations greater than those permitted for this generation;
(vii) aim to avoid imposing undue burdens on future generations.“

Provisions of Article 37 of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16) stipulate general safety requirements that need to be met during the process of radioactive waste management. These requirements are described in detail by license holders (for performing radiation practice and/or for radioactive waste storage management) in the Safety Report, which is only one part of the documentation necessary for meeting the conditions for obtaining the license for radioactive waste storage management. Established requirements include: analysis and description of the storage facility site (demography, topography, meteorology, hydrology, geology, seismicity, impact of surface and groundwaters, environmental protection), technical characteristics of the storage facility, analysis of safety of the storage facility, working conditions and restrictions, methods and devices for ionizing radiation protection, radioactive waste data, plans, measures and procedures in case of a radiation accident, quality assurance and control programme, overview of measures of physical security of the storage facility, description of organization of regular operation of the storage facility. The Law also requires that all applied protection measures for radioactive waste management are harmonized with internationally recognized criteria, standards and guidelines. Moreover, Article 37 stipulates that radioactive waste generated during the performance of radiation practice should be as low as possible by activity and by volume.

It is important to underline that the comprehensive documentation submitted with the application for the License for radioactive waste storage management also includes:

- Study on climatological characteristics of Podgorica area for radioactive material storage purposes;
- Report on geotechnical properties of the terrain for the purposes of construction of the facility for radioactive waste treatment and its temporary storage on the site that includes one part of the cadastral plot No. 2049 in the Cadastral Municipality (CM) Podgorica III, in Podgorica;
- Opinion on the load-bearing capacity of foundations and seismic resistance of as-built structure of the building;
- Report on stormwater risks for the building;
- Report on hydrological characteristics of the site for the purposes of construction of the storage facility building;
- Report on geological characteristics of the storage facility site;
- Approval to the Environmental Impact Assessment Study;
- etc.

A detailed analysis – radioactivity monitoring was performed in the area where the storage is located now before putting the storage into operation, and the status was zero. Later, a monitoring programme is implemented every year – two independent programmes of monitoring of interior and exterior of the storage, as per the license requirement. One programme is performed by the LLC "Center for Ecotoxicological Research" CETI as the operator, and the other one is performed by an independent institution which meets all the necessary requirements. The structure of both programmes is almost identical, and they include the following types of testing:

- testing of radon concentration in the premises of the radioactive waste storage facility;
- gamma spectrometric analysis of samples of ground and surface waters, air and soil from the immediate surrounding of the storage;
- testing the level of exterior radiation by TL dosimeters and automatic measuring systems;
- testing the level of contamination – dosimetry test of the immediate surrounding of the storage – gamma, beta and alpha components of radiation;
- testing the level of contamination – dosimetry test of the interior of the radioactive waste storage, gamma and neutron components;
- testing the level of contamination – in situ gamma spectrometric test;
- testing total alpha and beta activity in waters;
- testing the level of contamination – testing of surface sweeps.

In addition to the Law, this issue, regulated by Article 11 of the Joint Convention and related to general safety requirements, is regulated in the national legislation through several secondary legislation documents, indicatively: the *Rulebook on detailed conditions for obtaining the license for radioactive waste storage management* ("Official Gazette of Montenegro", No. 56/11), *Rulebook on the method of collecting, keeping, processing and storing radioactive waste ("*Official Gazette of Montenegro", No. *58/11), Decision on conditions for location, construction, trial operation, commissioning, operation*

and decommissioning of a nuclear facility ("Official Gazette of FRY", No. 42/97) (Chapter V of this Decision is no longer in force) and the *Decision on the manner of and the conditions for systematic testing of radionuclides presence in the environment surrounding a nuclear facility* ("Official Gazette of FRY", No. 42/97). The content of the Safety Report, as a mandatory document for the procedure for issuing the license for radioactive waste storage management is given in the Rulebook on detailed conditions for obtaining the license for radioactive waste storage facility management ("Official Gazette of Montenegro", No. 56/11).

The issue of radioactive waste management is regulated by the *Rulebook on the method of collecting, keeping, processing and storing of radioactive waste ("Official Gazette of Montenegro", No. 58/11)*, which stipulates the method in which radioactive waste is collected, kept, processed, registered and stored, which is the subject of Article 11 of the Convention: General Safety Requirements. The above mentioned Rulebook is mostly harmonized with international IAEA standards.

Compared to the previous National Reports on Implementation of Obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the progress has been achieved in the strategic framework, that is, the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management with the Action Plan for its Implementation for 2017-2021, describes in detail radioactive waste management through the sub-chapters: Radioactive Waste Classification; Naturally Occurring Radioactive Material (NORM); Radioactive Waste Producers; Type and Quantities of Radioactive Waste and Disused Sealed Radioactive Sources and Quantities of Expected Radioactive Waste; Radioactive Waste Storage Facility; Decommissioning of the Radioactive Waste Storage Facility and Radioactive Waste Disposal.

All guidelines from the Strategy 2017-2021 resulted in detailed norms prescribed in the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security.

9.2 Articles 12-17

Article 12 Existing Facilities and Past Practices

„ Each Contracting Party shall in due course take the appropriate steps to review:

(i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

(ii) the results of past practices in order to determine whether any intervention is needed for the protection against radiation bearing in mind that the benefit resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention."

Article 13 Location of Proposed Facilities

„ Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:

(i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;

(ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;

(iii) to make information on the safety of such a facility available to members of the public;

(iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

To that effect, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being located in accordance with the general safety requirements of Article 11.“

Article 14 Design and Construction of the Facilities

„ Each Contracting Party shall take the appropriate steps to ensure that:

(i) the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including planned or uncontrolled releases;

(ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

(iii) at the design stage, technical provisions for the closure of a disposal facility are prepared;

(iv) the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analyses.“

Article 15 Assessment of Safety of Facilities

„Each Contracting Party shall take the appropriate steps to ensure that:

(i) before construction of a radioactive waste management facility, systematic safety analyses and an assessment of impact on environment appropriate to the hazard the facility represents during its operating lifetime shall be carried out;

(ii) in addition, before construction of a disposal facility, systematic safety analyses and an environmental assessment for following the closure shall be carried out and the results shall be evaluated against the criteria established by the regulatory body;

(iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety analyses and of the environmental assessment shall be prepared when deemed necessary to complement the analyses and assessments referred to in paragraph (i).“

Article 16 Operation of Facilities

„ Each Contracting Party shall take the appropriate steps to ensure that:

(i) the license to operate a radioactive waste management facility is based upon appropriate provisions as specified in Article 15 and is conditional on the completion of a decommissioning program demonstrating that the facility was constructed in accordance with design and safety requirements;

(ii) operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and checked as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility, the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the provisions as specified in Article 15 for after the closure;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;

(v) procedures for marking and classification of radioactive waste are applied;

(vi) incidents significant to safety are reported in a timely manner by the holder of the license to the regulatory body;

(vii) programs to collect and analyse relevant operating experience are established and where appropriate, action is taken based on the results;

(viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

(ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body."

Article 17 Institutional Measures after Closure

„ Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

(i) records of the location, design and inventory of that facility required by the regulatory body are preserved;

(ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and

(iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented."

The Government of Montenegro recognised the issue of radioactive waste management as a problem that needed urgent attention, especially with a view of safety and security. Therefore, in 2005 the Ministry responsible for environmental protection set up an Expert Team tasked with developing a project for interim storage of radioactive waste, after which over the period between 2006 and 2008 the Government appropriated funds and constructed an interim storage facility for radioactive waste located within the yard of the LLC "Centre for Eco-Toxicological Research". The immediate vicinity of the LLC "Centre for Eco-Toxicological Research" CETI's building was chosen as the most suitable one, given the requirements for physical protection, infrastructure and the proximity of expert and analytical support, necessary for the operation and smooth functioning of the planned installation. Given the small amounts of radioactive waste in Montenegro, and that no significant increase is envisaged, this location was accepted and verified by the issued location decision. As a part of the civil engineering Project, the Environmental Impact Assessment EIA study was developed and the Environmental Consent has been issued for the Study on the Assessment of Impact of the construction of the Radioactive Waste Processing and Temporary Storage Facility, in line with the above provisions. After this, the building permit was granted. The main design of this facility, which preceded the issuance of the building permit, was developed in accordance with the issued urban planning and technical requirements, the terms of reference, current legislation, technical regulations, norms and standards for design, construction and use of facilities of this kind and all stages of project documents were harmonized. Permanent expert supervision over the construction and civil engineering works was done by the competent authority, the Public Works Directorate of Montenegro. The technical review and approval of the construction works for the radioactive waste storage facility was done by the public Institute for Development and Research in the Area of Occupational Health and Safety from Podgorica, the competent authority for such tasks, after which they issued the Report on Technical Review of

Construction Works. After the technical review, granting of the Use permit verifying that the facility may be put to use to which it was built.

The radioactive waste storage facility was developed with the support of the IAEA through the national project MNE3002 – Strengthening Radioactive Waste Management. Several expert missions took place within the project framework which visited the facility during its construction and reviewed the full project documents, gave suggestions which were followed in all construction phases. Within the framework of the mentioned project, the equipment for the storage facility was provided, several trainings delivered for the LLC "Centre for Eco-Toxicological Research" CETI's staff (CETI is the licence holder for operating radioactive waste storage facility).

Pursuant to Article 15 of the Joint Convention, the issue referring to assessment of safety of construction of facility for radioactive waste management, in the national legislation, is regulated by the Law on Environmental Impact Assessment ("Official Gazette of Montenegro" No. 075/18). Thus the provisions of this Law stipulate that the subject of environmental impact assessment are all the projects envisaged and implemented which may have a substantial impact on the environment or public health and that impact assessment is done for projects in the area of industry, mining, energy, transport, tourism, agriculture, forestry, water management and municipal services, as well as for all the projects envisaged within the protected natural resource and in the buffer zone to the protected immovable cultural heritage. Provisions of this Law envisage that a special regulation will stipulate which projects require mandatory impact assessment and for which projects such assessment may be required. Thus, the Decree on the Projects Subject to EIA stipulates that the projects which require EIA are listed in List I to the Decree, which, inter alia, stipulates mandatory EIA for facilities for removal or recycling of hazardous waste by incineration, chemical or biological treatment, as well as the landfills for temporary and final disposal of hazardous and radioactive waste**.**

Under provisions of the Law on Ionizing Radiation Protection and Radiation Safety („Official Gazette of Montenegro", No. 56/09, 58/09), which specify the conditions for obtaining a permit for the management of radioactive waste storage, the LLC „Center for Ecotoxicological Research" submitted an application for obtaining a permit for the management of radioactive waste storage to the Nature and Environmental Protection Agency on August 2010. After the review and analysis of documents by the Agency and amending of the application by the applicant, director of the Nature and Environmental Protection Agency formed a Commission to give an expert opinion with regard to fulfilment of requirements for obtaining the permit. The Commission was composed by representatives of the University of Montenegro, Capital Podgorica, Clinical Centre of Montenegro, Ministry of Health, Ministry of Agriculture, Forestry and Water Management, Commission for Prevention of Conflict of Interests, Ministry of Interior, non-governmental organisations and officers of the Environment Protection Agency, which ensured full transparency of this process. On the basis of the Report of the Commission and an overview of submitted documents, the Nature and Environmental Protection Agency concluded that **the applicant did not fulfil the prescribed requirements** for obtaining a permit for the management of radioactive waste storage, under applicable regulations, which are not harmonized with the most recent international standards in this field. Having this in mind, the **Commission recommended that rulebooks regulating matters of radioactive waste management should be drafted in the shortest period possible**, as provided for in the Law on Ionizing Radiation Protection and Radiation Safety (Official Gazette of Montenegro 56/09, 58/09) and, upon adopting of the rulebooks, the applicant for obtaining a permit for the management of radioactive waste storage should be suggested to renew the application for submitting the prescribed documents. In relation

to this, in 2011 the Ministry of Sustainable Development and Tourism drafted and adopted the **Rulebook on detailed conditions for obtaining a permit for the management of radioactive waste storage** („Official Gazette of Montenegro", No. 56/11) and the **Rulebook on method of collecting, keeping, processing and storing of radioactive waste** („Official Gazette of Montenegro", No. 58/11), which are harmonized with international standards, in which a new classification of radioactive waste is regulated in accordance with the latest IAEA standards, clereance level, exemption level, discharges, waste acceptance criteria for radioactive waste, etc. Article 17 of the *Rulebook on the method of collecting, keeping, processing and storing radioactive waste* defines, among other things, the acceptance criteria for the reception of radioactive waste in the storage facility and they are an integral part of the Safety Report for the radioactive waste storage facility. The *Rulebook on detailed conditions for obtaining the license for radioactive waste storage management* defines, among other things, necessary documentation confirming that conditions for a safe and secure operation of the storage facility have been met. In relation to that, it is necessary to underline that the Safety Report, as the most comprehensive document, contains: access to the safety of the storage facility; description and analysis of the storage facility site; technical characteristics of the storage facility; analysis of the safety of the storage facility including the data; description of construction of the storage facility; organization of work of the storage facility; working conditions and restrictions; organization of ionizing radiation protection; the manner of and procedures for handling radioactive waste in the storage facility; radioactive waste data; the manner of and procedures for proceeding in case of radiation accident (planned measures in case of a radiation accident in the storage facility); the **Quality Assurance Programme for Radioactive Waste Management**, i.e. the quality assurance for providing a high quality management of the radioactive waste storage facility applying international standards (Quality Assurance Program); the manner of providing physical security and technical protection of the radioactive waste storage facility and the decommissioning method.

After publishing of the new rulebooks, the **LLC „Center for Ecotoxicological Research"** referred to the Nature and Environmental Protection Agency with an application for obtaining a permit for the management of radioactive waste storage. With the aim of increasing public participation in the decision-making process, on 30 May 2012 a **Public consultation was organized on the draft license for the management of radioactive waste storage**. Namely, the Public consultation was organized by Aarhus Centres in Podgorica and Niksic with the support of the OSCE Mission to Montenegro. The public consultation was attended by representatives of the Ministry of Sustainable Development and Tourism, the OSCE Mission to Montenegro, the Ministry of Science, LLC "Center for Ecotoxicological Research", Nature and Environmental Protection Agency, NGO "Green Home", Environmental Movement "Ozone", students of the "School of Environmental Activism", representatives of parliamentary parties and the media.

The renewed process of issuing of the said permit started in January 2012 by filing an application, and it was completed on 13 June 2012 by issuing of **the permit based on the Decision number UPI-13/4.**

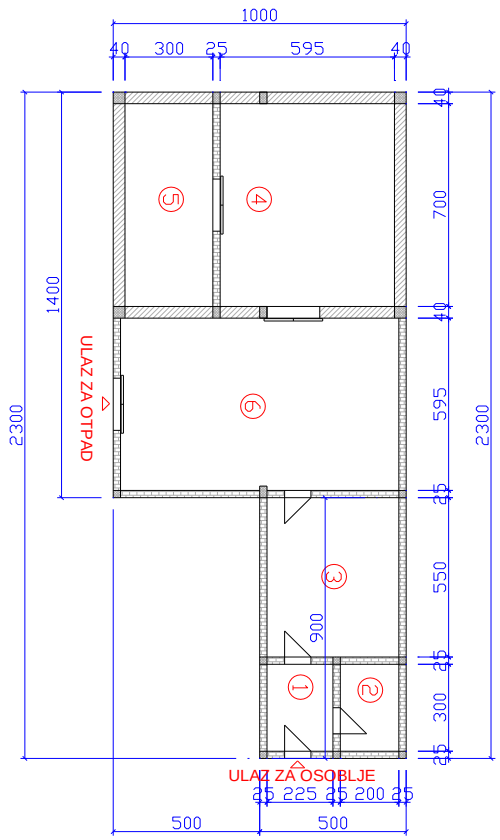
The Nature and Environmental Protection Agancy has issued **Supplementary Decision (UPI - 891/1) to LLC „Center for Ecotoxicological Research" on approving the removal and transport of radioactive lightning rods.** Pursuant to this Supplementary Decision LLC „Center for Ecotoxicological Research" is obliged, in accordance with the regulations, to act in accordance with the standard operating procedures attached to the request for the issuance of the Supplementary Decision.

CETI vas also obliged to issue an acknowledgment to the user after the removal of the radioactive lightning rod that the radiation source was properly stored and to inform the Nature and Environmental Protection Agency; to transport the radioactive lightning rod with a special vehicle; that the radiation source, during transport, must be in a transport container; to collect, sort, label, store and prepare for the transport of radioactive waste in order to meet the criteria of acceptability of radioactive waste to the storage facility; to meet safety and security requirements that provide adequate protection for occupationally exposed persons and the public. Also before the start of the removal of the radioactive lightning rods LLC „Center for Ecotoxicological Research“ was obliged to provide approval for the transport of radioactive materials issued by the Nature and Environmental Protection Agency with the prior consent of the Ministry of Interior - Directorate for Emergency Situations. In case of change of the conditions determined by this decision, CETI is obliged to immediately inform the Nature and Environmental Protection Agency.

The facility is fully compliant with all safety requirements stipulated by the law and secondary legislation, related to the safe and secure storage of radioactive waste and disused sealed radioactive sources, in accordance with international standards.

The total outer area of the storage facility is 185m^2, while the useful area of the facility is 162.4 m^2. The area of a part of the facility for storing radiation sources and radioactive waste is 62.65 m^2. The room for receiving and processing waste has the area of 59.5 m^2, and the administrative and technical room 40.25 m^2. The radioactive waste storage facility is a one-floor building. The size and the layout of rooms are showen in the following figure:

LAYOUT OF THE STORAGE FACILITY



1. SANITARY FILTER – CONTROL POINT
2. DECONTAMINATION AREA (BATHROOM AND TOILET)
3. ADMINISTRATION – MEASUREMENTS ROOM
4. RADIOACTIVE WASTE STORAGE
5. SEALED SOURCES STORAGE
6. RECEIVING AND PROCESSING RADIOACTIVE WASTE

Consideration of all important aspects of safe operation of the radioactive waste storage facility in Podgorica is analyzed in the Safety Report.

As regards the "**ageing phenomena"**, it was considered initially during planning of the radioactive waste storage and selection of technologies and methods of processing and packaging of radioactive waste.

First, the following was considered:

- Radioactive waste in Montenegro by its structure is low and intermediate level radioactive waste;
- all known disused radioactive sources have been removed, dismantled, conditioned (except two caesium sources) and packed;
- Storage is performed in specifically designed stainless steel containers which are intended for storage and meet the disposal criteria;
- There is a set of control procedures which establish the condition of the facility and of stored radioactive material. This primarily relates to the two independent programmes of monitoring of interior and exterior of the storage. One is performed by the holder of the license to manage the radioactive waste storage, LLC "Center for Ecotoxicological Research" CETI, and the latter is performed by an independent institution that meets all the requirements and offers the most advantageous conditions at the tender to perform this task;
- The radioactive waste storage and all installations are controlled periodically by a licensed institution, in accordance with a special law, and by inspection as well.

Until the conditions for radioactive waste disposal are met, according to the provisions of Article 38 of the *Law on Ionizing Radiation Protection and Radiation Safety* ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16), radioactive waste will be stored with the legal entity holding the license for radioactive waste storage management.

Issuing of the license for radioactive waste storage management was followed by beginning of the process of collection, transportation and storing of radioactive material, radioactive lightning rods, fire detectors and compasses with radioactive isotopes and disused sealed radioactive sources from the territory of Montenegro, which are safely and securely stored in the central radioactive waste storage facility. Section D: Registers and Lists provides tabular representations of the types and quantities of radioactive waste and disused sealed radioactive sources stored in the radioactive waste storage facility.

There is also a temporary storage facility in which are the remains of an aircraft engine, whose permanent solution is in the focus of the competent institutions, ie resolving the issue of decommissioning of that location in the forthcoming period, which is explained in more detail in section 3.3. Radioactive Waste Management Procedures.

The **practice that has proven to be good** in Montenegro is that radioactive sources are returned to the country of origin after use, and this is one of the conditions given in the license, and from that aspect the return of radioactive sources to the manufacturer/supplier is controlled in one way. On the return of a source, the holder of the appropriate license for the use of that source shall draw up a contract for the return of the source. The control of the implementation of this process is performed by the

Administration for Inspection Affairs through the Ecological Inspection - the inspector for ionizing radiation protection.

The summary of collected radioactive material and disused sealed radioactive sources, together with information on their conditioning, is given in the Section J: Disused Sealed Sources of this Report, whereas the detailed description of the entire process with an overview of sources and the description of the terrain is presented in the Second National Report on the Implementation of Obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

All states having on their territories a storage facility where disused sealed radioactive sources and/or radioactive waste are stored should adopt a decision on disposal, whether in the country or abroad. The Joint Convention also stipulates that all member states have to establish the spent fuel and radioactive waste management policy, which also includes its final disposal.

As far as the further steps regarding the management of disused sealed radioactive sources and radioactive material/waste in Montenegro are concerned, special attention to this issue is paid within the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for its Implementation for the period 2017-2021. To be able to adopt a decision on future steps regarding the management of disused radioactive sources and radioactive waste in the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for its Implementation for the period 2017-2021, it is underlined that the Ministry of Sustainable Development and Tourism should prepare, in cooperation with relevant institutions and the IAEA, the **Analysis of further steps for management of disused sealed radioactive sources and radioactive waste**, prior to the adoption of the new strategic framework. This Analysis should elaborate several management options for disused sealed radioactive sources and radioactive waste and to propose, after their elaboration, the most acceptable options from the ecological, social and economic point of view. The most acceptable options from the Analysis will be incorporated in the future strategic or programme framewok.

Montenegro, as the country that participates in the interregional project of IAEA INT9182 „Sustaining Cradle-to-Grave Control of Radioactive Sources“, provided its contribution to development of the “Analysis on further steps for management of disused sealed radioactive sources and radioactive waste“, which also includes the issue of radioactive waste disposal. The analysis and its application should help the participating countries to implement all radioactive waste management programs that will have clear guidelines, activities, stakeholders, implementation indicators, the amount of financial resources required and time frames for implementation.

10 Section I: Transboundary Movement

10.1 Article 27: Transboundary Movement

„Each Contracting Party involved in trans-boundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.
To that effect:

(i) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that trans-boundary movement is authorized and takes place only with the prior notification and consent of the State of destination;

(ii) trans-boundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;

(iii) a Contracting Party which is a State of destination shall consent to a trans-boundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;

(iv) a Contracting Party which is a State of origin shall authorize a trans-boundary movement only if it is convinced in fulfilling of conditions stipulated in subparagraph (iii) in relation to the consent of a State of destination;

(v) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a trans-boundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.

A Contracting Party shall not license the shipment of its spent fuel or radioactive waste for storage or disposal to a destination south of 60 degrees of southern latitude.
Nothing in this Convention prejudices or affects:

(i) the exercise of rights and freedom of movement of ships and aircraft of all States, in maritime, river and air navigation, as provided for in international law;

(ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;

(iii) the right of a Contracting Party to export its spent fuel for processing;

(iv) rights of a Contracting Party to which spent fuel is exported for processing to return, or provide for the return of, radioactive waste and other products resulting from processing operations to the State of origin.“

According to Article 19 of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16), **import of radioactive waste as well as the treatment, storage and disposal of radioactive waste of foreign origin are prohibited** on the territory of Montenegro. This Law regulates the issue of safe and secure management of radioactive waste on the territory of Montenegro, but not its shipments, ie export or transit. Montenegro does not have spent fuel, so this Law does not regulate the issue of safe management of spent fuel and its shipments.

Provisions of Article 16 of the Rulebook on the method of collecting, keeping, processing and storing radioactive waste ("Official Gazette of Montenegro", No. 58/11) stipulates that a disused sealed radioactive source or a radioactive source which is no longer intended for use shall be stored in the central radioactive waste storage facility, if its restitution to the supplier is not possible.

Regarding the management of radioactive waste generated during accidental or incidental situations, if it happened at the holder of the license to perform radiation parctice, the primary responsibility lies with the holder of the license to remediate the situation and pay for the storage of generated radioactive waste. The same applies if the permit holder has caused damage outside his premises.

If the situation occurs on the territory of Montenegro for which the local self-government unit is in charge, when the license holders are not responsible, the costs in that case are provided from the Budget of Montenegro.

Aware of the need to regulate the issue in regard of Article 27 of the Joint Convention - Transboundary Movements, and the need to transpose Council Directive 2006/117/ EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel, and Commission Decision of 2008/312 of 5 March 2008 establishing a standard document for the supervision and control of shipments of radioactive waste and spent fuel referred to in Council Directive 2006/117/EURATOM, Montenegro developed **the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security**, to which a special chapter refers to **transboundary shipments of radioactive waste and/or spent fuel.**

What is regulated for the first time are the conditions for transboundary shipments, ie **conditions for export or transit of radioactive waste or transit of spent fuel,** for which authorisation are issued on the prescribed standardized form, according to which all participants in the shipment must act. It also regulates the procedure in case of a failed shipment, the manner of obtaining consent and the exchange of information between the countries participating in the shipment, as well as the manner of reporting to the European Commission on shipments. In addition to the above, the conditions under which radioactive waste is sent for processing or reprocessing or disposal are prescribed. **Exclusion from the scope of application** of provisions for transboundary shipments of radioactive waste and/or spent fuel have been defined.

Also, legal provisions **established prohibitions of the export of radioactive waste**, which stipulate that the export of radioactive waste is prohibited:

- to a destination south of latitude 60° south;
- to a State which is party to the Partnership Agreement between the members of the African, Caribbean and Pacific Group of States of the one part, and the European Community and its Member States, of the other part, (Cotonou ACP-EC Agreement) which is not a European Union Member State (this prohibition does not apply to shipments of radioactive waste for processing and reprocessing or disposal); or
- to another country which does not, in the opinion of the Nature and Environmental Protection Agency, have the administrative and technical capacity and regulatory structure to manage the radioactive waste or spent fuel safely, as stated in the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, taking duly into account any relevant information from other Member States, of which the Agency, in cooperation with

the ionising radiation protection inspector, shall make a written record and inform the European Commission and the Advisory Committee.

The Agency **provides an opinion** based on the criteria of the European Commission for the export of radioactive waste and spent fuel to other countries.

The holder of a storage or disposal license **may only send** radioactive waste for reprocessing or reprocessing and shall be **obliged to accept back and receive** radioactive waste sent for reprocessing or reprocessing to a Member State of the European Union or a non-EU Member State **and to take** all necessary safety and security measures. He is also ultimately responsible for the safe and responsible storage of waste, including waste generated as a by-product of reprocessing or reprocessing.

Radioactive waste generated in Montenegro may be disposed of in a Member State of the European Union or in a country which is not a Member State of the European Union, **on the basis of signed an Agreement** on the use of that country's radioactive waste disposal facility.

Prior to a shipment of radioactive waste to a non-EU Member State, the Agency shall inform the European Commission of the content of the agreement, which can only be signed if the country with which the agreement is concluded:

- has concluded an agreement with the European Union covering the disposal of radioactive waste or is a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;
- has adopted a radioactive waste management programme, including disposal with objectives representing a high level of safety equivalent; and

if the radioactive waste disposal facility is licenced.

Further, the **return of unauthorized shipments** is prescribed. Namely, the holder of a storage license or disposal license **is obliged to return the radioactive waste** to Montenegro if:

- the shipment was not authorised in accordance with this Law, or
- radioactively contaminated waste or material containing a radioactive source has not been declared as radioactive waste.

The Proposal of the law stipulates conditions for the issuance of authorisations and various consents of the countries participating in the shipment of radioactive waste and/or spent fuel. Therefore, **the export or transit of radioactive waste or the transit of spent fuel** can be performed by a company, other legal entity or an entrepreneur who **has submitted** to the Agency an application for the issuance of an authorisation for a shipment of radioactive waste or an application for an authorisation for a shipment of spent fuel.

Applicants are obliged, before issuing of an authorisation, to pay to the special sub-account of the Budget (nuclear account) funds for coverage of possible nuclear damage that may occur during export or transit, in accordance with the law governing the liability for nuclear damage and provide proof to the Agency (administrative body). Also, conditions under which an application in respect of more than one shipment can be submitted are prescribed.

Following submitted application the Agency shall send the application for consent to the competent authority of the country of destination and of the countries of transit, with which shall agree on the manner of sending and protecting information in order to prevent their misuse, in accordance with separate laws and regulations. In this

communication the Agency shall check whether the competent authority of the country of destination or transit has verified that the application has been duly completed within 20 days following the day of receipt of the application.

If the requirements are duly met, the Agency shall obtain from the competent authority of the country of destination **an acknowledgment of application receipt** and a notification that a copy of the acknowledgment of application receipt has been sent to the other competent authorities of countries involved in the shipment, not later than 10 days after expiry of the period (20 days).

If, in the opinion of the competent authorities of the countries involved in the shipment, the **application needs to be supplemented**, the competent authorities shall inform the Agency by sending **a request for missing information** made not later than the expiry of the period of 20 days, of which the applicant shall be notified by the Agency. In this case the applicant shall promptly provide to the Agency with the missing information using the application.

Than the **Agency shall submit the missing information** to the competent authorities of the countries involved in the shipment on the supplemented application. Following the submission of requested missing information, the Agency **shall obtain** from the competent authority of the country of destination an acknowledgment of receipt of such information and it **shall send a copy of the acknowledgment** to the other competent authorities of countries involved in the shipment, not later than 10 days after expiry of the period (20 days). It is also prescribed the time period for issuing acknowledgements, information and for sending missing information which may be shortened on the basis of an agreement between the Agency, the competent authority of the country of destination and the country of transit.

The Agency **shall obtain acknowledgment of consent** to an application for authorisation of radioactive waste and/or spent fuel shipment or for missing information or an acknowledgement of refusal of an application for authorisation of radioactive waste and/or spent fuel shipment from the competent authorities of the countries involved in the shipment, not later than two months from the date of issue of the acknowledgment of application receipt.

At the request of the competent authorities of the country of destination or any country of transit, the Agency may approve a **further period for acting on the applications**, but not more than one month after expiry of the two-month period.

If upon expiry of the prescribed period, **no reply has been received** from the competent authorities of the countries of destination and/or countries of transit, those **countries shall be deemed to have given their consent** for the shipment requested.

If the competent authorities of countries **refuse to issue an acknowledgment of consent** for the shipment, the **Agency shall obtain a justification** explicitly stating the reasons for the refusal.

Any conditions imposed by the competent authorities of the country of transit or of destination in the additional information, **may not be more stringent than those** laid down for similar shipments within those countries.

The competent authority of the country **which issued the acknowledgment of consent** for the shipment of radioactive waste and/or spent fuel in transit **may not refuse to issue acknowledgment of consent for reshipment**:

- after processing or reprocessing of the material which may be radioactive waste or other by-products equivalent to the original material, which has been sent for processing or reprocessing;
- if the reshipment is undertaken on the same conditions and with the same specifications.

If the applicant for participation in the shipment is a damaged party due to an unjustified delay and/or lack of cooperation with the competent authorities of another European Union Member State, the Agency shall inform the European Commission thereof.

After all issued consents, the Agency issues to the applicant **an authorization for the shipment of radioactive waste or an authorization for the shipment of spent fuel**, after which the holder of the authorization **is obliged to submit** to the Agency a description of the shipment and a list of packages.

An authorisation, description of the shipment and a list of packages agency shall send to the competent authority of the country of destination, competent authorities of European Union Member State or to competent authorities of the countries of transit.

If the competent authorities of the countries involved in the shipment **issue an acknowledgment of refusal of the shipment,** the Agency **shall refuse to issue an authorisation of shipment**. The **Decision to refuse to issue the authorisation** shall be communicated by the Agency to the competent authorities of the countries of origin, Member States of the European Union or other countries of transit.

The undertakings, holders of authorisations for shipments of radioactive waste or authorisations for shipments of spent fuel (export or transit of radioactive waste or transit of spent fuel) shall submit to the Agency an **acknowledgment of receipt of the radioactive waste or spent fuel**, within 15 days of receipt, as well as a declaration by the consignee of radioactive waste or spent fuel stating that the radioactive waste or spent fuel has reached its proper destination and the name of the last cross border point of entry of the consignment. If the country of destination is a European Union Member State, the last cross border point in the European Union through which the radioactive waste or spent fuel passed shall be indicated.

For each shipment, the Agency shall obtain a **copy of the acknowledgement of receipt** of radioactive waste or a copy of the acknowledgement of receipt of spent fuel from the competent authority of the country of destination, as well as **the notification that the country of destination has informed about receipt** of radioactive waste or spent fuel the competent authorities of European Union Member States or of other countries of transit, only if the country of destination is a European Union member state. Upon receipt of the acknowledgments the Agency shall submit a copy of the acknowledgments and notification to the undertakings.

Competent authorities of the countries participating in the shipment **may prohibit the delivery of the shipment**, **if the conditions for shipment are no longer complied** with in accordance with this Law or the laws of the countries involved in the shipment, and in that case the Agency shall forthwith obtain a written notification thereon from the competent authorities of the other countries involved in the shipment and inform the undertakings.

Where a shipment cannot be completed or if the conditions for shipment are not complied with in accordance with this Law, the ionising radiation protection inspector shall, under a proposal by the Agency, **prohibit the shipment or delivery of the shipment and ensure** that radioactive waste or spent fuel **is taken back by the undertaking and,** if needed, shall order the undertaking to take **corrective safety measures,** about which the competent authority of the country of origin, destination and transit shall be promptly notified.
The undertakings **shall be liable for costs** arising in cases **where the shipment cannot or may not be completed.**

Applications for shipments, authorisations and other documentation and information relating to shipments of radioactive waste and/or spent fuel **shall be supplied in a language that is acceptable** to the competent authorities of countries involved in the shipment. Also, **at the request** of the competent authorities of countries involved in the shipment the undertakings shall **submit an authenticated translation** of the documents in the appropriate language.

A report on shipments of radioactive waste or spent fuel shall be drawn up by the Ministry of Sustainable Development and Ministry every three years and forwarded to the European Commission.

In this chapter of the Proposal of the Law, there are a total of **12 different standardized forms (A1-A6/B1-B6)**, including the layout of the authorisations themselves, for which the same legal basis has been given, and which the Ministry of Sustainable Development and Tourism will adopt in one Rulebook, within which will transpose Commission Decision 2008/312 of 5 March 2008 establishing a standard document for the supervision and control of shipments of radioactive waste and spent fuel. In addition, by these norms **Article 27 of the Joint Convention and Council Directive 2006/117/EURATOM of** 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel **is fully transposed**, **a**s well as part of Council Directive 2011/70/EURATOM of 19 July establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste.

11 Section J: Disused Sealed Sources

11.1 Article 28: Disused Sealed Sources

„ Each Contracting Party shall within the framework of its national law undertake proper steps to ensure that disused sealed sources are safely kept, processed or disposed of.

A Contracting Party shall permit reentry of disused sealed sources into its territory provided that within the framework of its national law it envisaged that they should be returned to the manufacturer qualified to receive and keep disused sealed sources.“

The trade of ionizing radiation sources and radioactive material is regulated by the Chapter VII of the Law on Ionizing Radiation Protection and Radiation Safety (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16) (Articles 41-45). The trade of ionizing radiation sources and radioactive material (import, export, transit) may be conducted by a legal entity or an entrepreneur who obtains from the Nature and Environmental Protection Agency the license for trade of ionizing radiation sources and radioactive materials. The above mentioned Articles further stipulate that the Nature and Environmental Protection Agency will issue the license to the legal entity of entrepreneur who performs the trade of ionizing radiation sources and radioactive materials, if meets the conditions on licensing provided by the Law, provided that protection measures established by this Law are applied, and if such trade is carried out in accordance with accepted international conventions.

The above mentioned Articles further stipulate that the Nature and Environmental Protection Agency will issue the license to the legal entity of entrepreneur who performs the trade of ionizing radiation sources and radioactive materials, provided that protection measures established by this Law are applied, and if such trade is carried out in accordance with accepted international conventions.

To be able to carry out transport of radioactive materials, legal entities involved in this activity must have for this purpose a corresponding license according to regulations. The condition for obtaining the approval for transport of radioactive materials is to obtain the license for trade in ionizing radiation sources and radioactive materials, issued by the Nature and Environmental Protection Agency. The approval for transport of radioactive materials is issued by the Nature and Environmental Protection Agency, upon the approval issued by the Directorate for Emergency Situation of the Ministry of the Interior in accordance with the *Law on Transport of Dangerous Goods* (“Official Gazette of Montenegro”, No. 33/14, 13/18), which lays down the conditions for carrying out the transport of dangerous goods (class 7) and related operations (preparation of materials for transport, loading and unloading and intermediate handling operations).

According to Article 19 of the *Law on Ionizing Radiation Protection and Radiation Safety* (“Official Gazette of Montenegro”, No. 56/09, 58/09, 40/11, 55/16), import of radioactive waste as well as the treatment, storage and disposal of radioactive waste of foreign origin are prohibited on the territory of Montenegro. Provisions of Article 16 of the Rulebook on the method of collecting, keeping, processing and storing radioactive waste (“Official Gazette of Montenegro”, No. 58/11) stipulates that a disused sealed

radioactive source or a radioactive source which is no longer intended for use shall be stored in the central radioactive waste storage facility, if its restitution to the supplier is not possible. All holders of a license to perform radiation practices who owned sources of ionizing radiation and who procure them for their own needs from the supplier or directly from the manufacturer, are obliged to ensure the return of the source to the producer of that source through the source procurement contract.

In that way, financial resources are provided that ensure the return of the source to the producer, i.e. the purchase price includes the price of return of sources, which means that the holders of licenses to perform radiation practices who owned sources of ionizing radiation bear the costs of their return.

Therefore, the best international recommendations that disused sealed radioactive source is to be returned to the supplier are applied in Montenegro. In that respect, for instance, for each imported source used in the Clinical Centre of Montenegro, there is an agreement with the supplier that the source will be returned to him. It is also stipulated, among other things, that a disused sealed radioactive source must be packed in such way to prevent dispersion of radioactive material and must be stored according to its characteristics, which are defined in detail by acceptance criteria.

The provisions of Article 27 of the Joint Convention regulating the issue of transboundary movement, that is, the obligation of each Contracting Party involved in transboundary movement to take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments, are also contained in Article 45 of the *Law on Ionizing Radiation Protection and Radiation Safety* („Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16). This article stipulates that, in order to identify and prevent unlawful trade in radioactive and nuclear material across the borders of Montenegro, ionizing radiation monitors should be placed on border crossings, and that the expert technical assistance shall be provided by the Nature and Environmental Protection Agency. Montenegro does not have portal monitors and it has the obligation to acquire them in cooperation with available donors. Until their placement, the control of radioactivity on various goods, and especially on scrap metal, **is performed manually by authorized technical support organisations** LLC "Center for Ecotoxicological Research" and JSC "Institute of Ferrous Metallurgy". As stated in **subchapter 6.1.2 Inspection supervision**, **in the period between 1 October 2017 and 31 July 2020, a total of 182,080 controls on radioactivity were conducted** for import/export or transit of metals, metal products and raw materials, as well as construction products (90146 performed by LLC "Center for Ecotoxicological Research" and 91934 by the Institute of Ferrous Metallurgy JSC Nikšić), in accordance with the Checklist and the List of Goods Subject to Radioactivity Control. It is important to note that some owners of scrap metal yards now have radioactivity control instruments that they use for personal safety, but data of this type cannot be taken as valid, because only those issued by an authorized legal entity are valid. This part of the area is now regulated in a much more detailed way within the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security.

Since 2006, Montenegro has been a user of the Incident and Trafficing Database (ITDB), within which it has submitted data on detected illicit shipments of radioactive material to the International Atomic Energy Agency. In addition, Montenegro participates in platforms of the Unified System for Information Exchange in Incidents and Emergencies for early notification of incidents involving radioactive sources with potential

transboundary impacts (USIE) and the ECURIE platform for the early exchange of information in the event of a radiological emergency.

Each new found radioactive source, for which the owner is unknown, **represents a successful step in improving the protection of human health and the environment** from the harmful effects of ionizing radiation that may originate from radioactive sources that are not under regulatory control or supervision. Consequently, any activity in terms of finding and adequate management (storage or return to the owner if the owner is subsequently found) of the orphan source is an important link in the system of protection against the harmful effects of ionizing radiation. Accordingly, each detected orphan source and its management is an **indicator of the success** of managing sources without owners, so-called. "orphan" sources. In this regard, Montenegro points out the **good practice related to the found radioactive sources and materials** that were out of regulatory control, ie without owners, which are shown in Table 2.

Table 2: Data base on detected illicit shipments of radioactive material

No.	Radion uclide	Type of detected source/material	Quantity	Activity MBq	Owner/Freight company	Date of detection	Date of storing
1.	$Eu^{152/154}$	Radioactive lightning rod	1 pc.	2620	Recycling center	26.04.2013	19.06.2014.
2.	$Eu^{152/154}$	Radioactive lightning rod	1 pc.	1078	Jugoprodukt	20.10.2010	20.06.2013.
3.	Ra^{226}	instrument with radium colors	1 pc.	/	Jugoprodukt	20.10.2010	15.08.2013.
4.	Ra^{226}	instrument with radium colors	29 pcs.	/	Otpadaš		24.10.2013.
5.	Ra^{226}	instrument with radium colors	33 pcs.	/	De An	2014	09.02.2015.
6.	Ra^{226}	instrument with radium colors	14 pcs.	/	De An	2014	09.02.2015.
7.	Ra^{226}	instrument with radium colors	13 pcs.	/	SS Alga	2019	19.06.2019.

Note: *In addition to the above data, the International Atomic Energy Agency is provided with classified information, which is reported in the framework of the implementation of the Law ratifying the Agreement between Montenegro and the International Atomic Energy Agency on the implementation of safeguard measures in relation to the Agreement on Non-proliferation of Nuclear Weapons, Additional Protocol to the Agreement between Montenegro and the International Atomic Energy Agency on the implementation of safeguard measures in relation to the Agreement on Non-proliferation of Nuclear Weapons and the Protocol to the Agreement between Montenegro and the International Atomic Energy Agency on the implementation of safeguard measures in relation to the Agreement on Non-proliferation of Nuclear Weapons („Official Gazette of Montenegro – International Treaties", No. 16/10 of 28 December 2010).*

In case of detection of a source without known owner (orphan source), Article 37 of the *Law on Ionizing Radiation Protection and Radiation Safety* ("Official Gazette of Montenegro", No. 56/09, 58/09, 40/11, 55/16) stipulates that costs of its storage shall be provided from the Budget of Montenegro. According to the current legislation and regulations, the Administration for Inspection Affairs, through its ecological inspection,

carries out the inspection supervision, i.e. carries out the control of a source until its secure storage, finds the owner, if such thing is possible, and institutes legal measures against him. Therefore, in case of detection of an orphan source, if the inspector is unable to establish the owner, he will institute misdemeanour or criminal proceedings against unknown person and pronounce the measure of storing of the source in the radioactive waste storage facility.

If the owner is subsequently found, the State will claim cost recovery from the owner, and the inspection will apply penalty measures. If the owner is known from the beginning, the inspector will pronounce either a misdemeanour or a criminal measure, and will issue the order to put the lost source in a safe place at the owner permises, or into the radioactive waste central storage facility, if the source is no longer intended for use. In the majority of cases it is impossible to find the owner of the lost source.

Therefore, practice is well-organised in Montenegro when an orphan source is detected, however, the system in this respect needs to be improved and formalized by establishing of a formal Team for orphan sources detection. The Ministry of Sustainable Development and Tourism will establish the Team for orphan sources detection in cooperation with relevant institutions, and the Team will be obliged to prepare a Work Plan. After that, detection of orphan sources requires development of a formal procedure for involvement of certain Government bodies and institutions such as, for example: Police Directorate, Customs Administration, Administration for Inspection Affairs, Forensic Centre of Montenegro, Nature and Environmental Protection Agency, ITDB contact person, National Security Agency, Ministry of Sustainable Development and Tourism, Prosecutor's Office, etc.

Until the establishment of the formal Team, it is important to point out that the Ministry of Sustainable Development and Tourism implemented successfully the project "Strengthening of environmental protection system at the level of state institutions of Montenegro" in cooperation with OSCE mission to Montenegro during 2011, which was supported within the activities dedicated to improvement of the Strategy on Ionising Radiation Protection, Radiation Safety and Radioactive Waste Management. Three training courses were delivered within the project **for 110 officers of border police, customs outposts**, as well as staff members of the Nature and Environmental Protection Agency and the Ministry of Interior in central, northern and southern region of Montenegro. For the project sustainability, **a brochure** dedicated to prevention of illicit transport of nuclear and radioactive material **was prepared, as well as a manual for detection and handling of a radiation sources and for controlling functioning of dosimetry equipment,** which are published in eary 2012 on the website of the Ministry of Sustainable Development and Tourism, Police Directorate and the Customs Administration of Montenegro for the purpose of transparency and access to information.

Montenegro has made progress in upgrading the system by developing a new Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, which pays special attention to orphan sources, control of scrap metal and facilities with scrap metal and raw materials, and control of radioactivity in general. Thus, a system for the detection and management of orphan radioactive sources and/or nuclear material has been arranged, as well as the control of metal contamination. Business entities engaged in the collection and recycling, ie any type of processing of metal raw materials, metal products and scrap metal are obliged to obtain a certificate of those goods for radioactivity from radiation protection experts. In addition, they are obliged to regularly provide employees with vocational training and retraining in such a way as to enable

them to identify orphan sources that can very often be found in scrap metal, and then to act in accordance with a procedure which must be defined for that purpose. In order to facilitate this procedure, the Ministry of Sustainable Development and Tourism will issue a Rulebook on the manner of identification of orphan radioactive source and/or nuclear material and actions which has to be taken in case of detection and in case of possible emergency exposure situation that may occur.

Further, the Proposal of the Law stipulates that operators of facilities collecting, processing or melting scrap metal bear costs for ionising radiation protection at all levels. Also, if no owner is found, within 60 days of the discovery of the orphan radioactive source and/or nuclear material at the facility, the operator of the facility shall bear the costs of its transport, safe and secure storage, including emergency exposure situation and disposal costs, if necessary. If the owner of a lost radioactive source and/or nuclear material is found, the owner shall reimburse the operator of the facility for all the incurred costs. If the owner is found, within 60 days of the discovery of an orphan radioactive source and/or nuclear material, the owner shall take over the radioactive source and/or nuclear material if it wishes to use it and reimburse the costs incurred, and meets requirements for further management. If the owner does not intend to use radioactive source and/or nuclear material, he is obliged to reimburse the transport, storage, corrective measures and disposal costs.

Also, these costs are not new for importers, exporters, transit operators and operators who bear the same costs for measuring the radioactivity of prescribed types of goods at border crossings, given the previously prescribed obligation under the existing Law according to which foodstuff, feedstuff, medicines, tobacco and tobacco products, cosmetics, toys, jewelery, detergents (industrial detergent), plant nutrition products (mineral fertilizers), ores and raw materials, products in general use that come into contact with human skin and mucous membranes, other products in general use and other goods may not be imported, exported or transited for commercial purposes if they contain radionuclides above the prescribed limits.

Aiming to boost market competition and trade facilities, the Proposal of the Law took into account the recommendations given in the Final Report of the “Addressing Market Access Barriers in Selected Supply Chains in CEFTA” project implemented in the six CEFTA countries. The project was implemented by UNICTAD and the International Trade Centre (ITC) in collaboration with the German Federal Ministry for Economic Cooperation and Development. A number of analyses was developed within the framework of this project focusing on different barriers to trade identified by the private sector, and recommendations were given for addressing them, including some for **radioactivity control**. In this regard, the Proposal of the Law **envisages recognition of certificates/proof of radioactivity check** upon import and transit of water, metal, metal products and metal raw and building materials, which reduce business barriers.

It is important to inform that at the beginning of 2017, the update of the **Integrated Nuclear Security Support Plan (INSSP) for the period 2017-2019** was completed and an Action Plan for its implementation for the period 2017-2019 was developed. Namely, in August 2016, an expert mission was implemented in Podgorica in cooperation with the Department for Nuclear Safety and Security of the International Atomic Energy Agency and the Ministry of Sustainable Development and Tourism, whose goal was to revise the existing and develop a new Integrated Nuclear Security Support Plan (INSSP), as well as Action plan for its implementation for the period 2017-2019. In addition to the organizers' representatives, 22 representatives of Montenegrin

relevant institutions from the Ministry of Interior, the Police Directorate, the Forensic Center, the National Security Agency, the National Security Council, the Customs Administration, the Ministry of Information Society and Telecommunications, Ministry of Foreign Affairs and European Integration, Ministry of Defense, Ministry of Science, Faculty of Science and Mathematics, LLC "Center for Ecotoxicological Research", JSC Institute of Ferrous Metallurgy, Clinical Center of Montenegro took part in this expert mission. The objective of the INSSP revision included: identification of national needs and prioritizing needs, proposing effective implementation plans for the next three years based on defined national priorities, and raising awareness of the nuclear security information management system. The development of the National Detection Program will begin, which will include the identification of national needs and setting priorities in order to improve cross-border control, which will be the basis for the next update of the Integrated Nuclear Security Support Plan (INSSP). Also, what awaits Montenegro in the forthcoming period is the establishment of a system for the trade of nuclear materials, as proposed in the new Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, as well as the preparation of the necessary infrastructure (institutional and implementation) for implementation of these provisions, in accordance with the requirements of IAEA standards and the provisions of Council Directive 2006/117/EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel.

Performing practices involving radioactive sources and/or nuclear materials requires continuous improvement and implementation of measures to improve the safety and security culture, whereby it is necessary to establish an adequate management system when performing these practices. The Proposal of the Law defined in detail obligations of the holder of the decision on registration, licenses, approvals and permits (undertakings) from the aspect of safety and security of radioactive sources and nuclear materials and the need to appoint **a security officer** (person responsible for radiation and/or nuclear security) with a job description. Therefore, each legal entity pays special attention to the security aspect and for that purpose must designate, in addition to the radiation protection officer, a security officer to whom it must provide vocational training and retraining. The norms that legally regulate radiation and nuclear security represent the implementation of the guidelines given in the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 and significant progress compared to the existing legal solution. During the drafting of the Proposal of the Law in the field of security**, standards and publications of the International Atomic Energy Agency were used**, considering that, apart from ratified conventions, agreements, treaties and the Action Plan, the European Commission has no other Acquis in this area.

Also, the manner of ensuring international cooperation and providing assistance in the field of nuclear security in cases of theft or illegal taking of nuclear and other radioactive materials when notifying other states and international agencies that may be affected by the circumstances of a particular case and determining appropriate forms of cooperation and assistance recovery and protection of such material. Also, the manner of establishing a system for detecting and preventing illegal traffic is prescribed.

In order to further strengthen the legal framework and international cooperation, the Parliament of Montenegro adopted the Law ratifying Amendments to the Convention on the Physical Protection of Nuclear Material ("Official Gazette of Montenegro - International Agreements", No. 4/16), by which Montenegro contributed to internationally entry into force of Amendments to this Convention on 8 May 2016, with

a view to eliminating, by joint action of the Parties to the Amendment, potential dangers created by sabotage of nuclear material and nuclear facilities, misappropriation and the use of nuclear materials, as well as illegal trade in radioactive and nuclear material.

This is an expression of a clear position of Montenegro in combating nuclear terrorism. In addition, Montenegro formally expressed readiness to accept voluntarily implementation of non-binding Code of Conduct on the Safety and Security of Radioactive Sources, the supplementary Guidance on the Import and Export of Radioactive Sources and the supplementary Guidance on the Management of Disused Radioactive Sources, whose provisions it has also transposed in the framework of the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security.

Regarding the management of disused sealed radioactive sources, Montenegro in the previous period between 2012 and 2020 has made great progress in the management of disused sealed radioactive sources. Namely, in the sixties and seventies of the last century radioactive lightning rods were installed across Montenegro as a protection from lightning of high strength. They were installed in the residential facilities, schools, kindergartens, healthcare institutions, farms and factories. Those radioactive lightning rods (RLR) protect bigger area only if they contain radioactive source of proper energy. For this reason, radioactive sources should be regularly replaced by new ones to maintain efficiency in protection from thunderbolt. These lightning rods did not properly protect from thunderbolt any longer since their protection area lessened along with their energy. Such lightning rods are no longer installed and in some countries their use is prohibited, as it is prescribed in Montenegro by Article 19 of the Law on Protection against Ionizing and Radiation Safety. Despite the fact that their energy is low for proper operation, radioactive lightning rods represent radiological risk for the environment therefore they should be removed or replaced by other technologies (electronic lightning rods, etc.). Although while installed, radioactive lightning rods do not pose any danger to people living in buildings, however, there is always the possibility that either by mistake, weather disaster or intentional removal, the radiation sources may come into contact with the population and the environment. Therefore, it was decided to remove the radioactive lightning rods in Montenegro and store them in a radioactive waste storage facility built for that purpose.

The Ministry of Sustainable Development and Tourism and the Nature and Environmental Protection Agency in 2009 applied for the project approved by the European Commission under IPA 2009 Program on Nuclear Safety and Radiation Protection "**Management of sealed radioactive sources including radioactive lightning rods and improvement of the effectiveness of regulatory infrastructure in the area of protection against radiation in Montenegro, Nothern Macedonia and Kosovo** (under UNSCR 1244/1999)" of total value of 1,350,000 € ". The project was aimed at reducing radiological risks arising from unsecure and unsafe management of sealed radiation sources and radioactive lightning rods in Montenegro, Republic of Northen Macedonia and Kosovo (under UNSCR 1244/1999). The implementation of this project commenced in 2011 and was completed in 2014. The project itself consisted of four stages of implementation. The first two phases of the project, for which the implementing agency was ENCO from Austria, on behalf of the Consortium composed of representatives of the Slovenian Nuclear Safety Administration, the Institute for Occupational Safety from Ljubljana and the State Institute for Radiological and Nuclear Safety of Croatia, were successfully implemented and were related to the creation of preconditions for the implementation of the last phase of the project (adoption of

regulations, readiness of institutions to implement all provisions of regulations and establish a licensed radioactive waste storage facility).

This project included removing radioactive lightning rods from the territory of 17 municipalities of Montenegro and Capital Podgorica (Bar, Berane, Bijelo Polje, Budva, Danilovgrad, Herceg Novi, Kotor, Kolašin, Mojkovac, Nikšić, Plav, Pljevlja, Plužine, Rožaje, Tivat, Ulcinj and Žabljak), improving the effectiveness of management of sealed radioactive sources by all relevant institutions and entrepreneurs/legal entities, and raising awareness in the area of protection against radiation in Montenegro. Pursuant to decision of the European Commission, two final project stages were implemented in 2013 by the Ecotoxicology Research Center LLC. The equipment was procured after the Agreement was signed by and between CETI and the European Commission therefore, all necessary conditions were created for implementation of III and IV project stages. These project stages referred to the procurement of necessary equipment and removal, dismantlement and storage of radioactive lightning rods, as well as the collection transport and storing of disused sealed radioactive sources from temporary storage facilities on the territory of Montenegro and their storing in radioactive waste storage facility.

Pursuant to the Agreement concluded with the European Commission on 29 March 2013, the Ecotoxicology Research Centre LLC was obliged, starting from 1 August 2013, to remove, transport and store radioactive lightning rods in the radioactive waste storage facility, as well as to collect, transport and store all disused sealed radioactive sources from the temporary storage facilities in the territory of Montenegro.

The Ministry of Sustainable Development and Tourism and the Nature and Environmental Protection Agency were the leading supervisors of regulatory compliance of the activities carried out during the preparation of Agreement and the implementation of Project. The Agency and the Administration for Inspection Affairs through ecological inspection exercised control and performed supervision so that all relevant safety regulations pertaining to removal, transport and storage of radioactive sources are fully met. The Ministry of Internal Affairs (Directorate for Emergency Situations) was also involved which together with the above institutions and the European Commission monitored the implementation of this significant and demanding project in accordance with powers under the Law on Protection and Rescue, Law on Transportation of Dangerous Goods and National Plan of Action in Case of a Radiation Accident.

Within this project, a **total of 8470 disused sealed radioactive sources and materials were collected,** including radioactive lightning rods, compasses and fire detectors with radioactive isotope, which were safely and securely stored in the radioactive waste storage facility. It is extremely important to emphasize that all activities performed during the implementation of the Project were implemented in a safe and secure manner and in accordance with the Quality Assurance Program (QAP), Safety Report, Standard Operating Procedures and ALARA principle.

All radiation sources are removed /taken over with the written consent of their owners, ie the owner of the sources. Figures 1 and 2 show the removal of radioactive lightning rods from hotels in Petrovac and Bečići (Budva Municipality).

It is important to point out that after the removal of the radioactive lightning rods, the installation of electronic lightning rods was done in parallel.

Figure 1 Removal of radioactive lightning rod from the Castellastva Hotel in Petrovac

Figure 2 Removal of radioactive lightning rod from the Mediteran Hotel in Bečići

Safe and secure management of radioactive radiation sources is the basic activity which achieves the preservation and protection of life and health of present and future generations and the protection of the living and working environment. It is important to point out that Montenegro has implemented the most demanding phase of the project with its own capacities - removal, transport (transport) and storage of radioactive lightning rods and disused sealed radioactive sources.

As indicated in the Third National Report, Montenegro, with the support of the IAEA, continued its activities on the management of radioactive sources, ie their conditioning. Within the interregional project INT9176 "Strengthening the control of disused sealed radioactive sources in the Mediterranean", **a total of 1367 different sealed sources were conditioned,** of which 71 radioactive lightning rods, 27 disused radioactive sources from industry and 1269 calibration sources. In addition, what is very important is that the employees of LLC "Center for Ecotoxicological Research" - CETI, whose work activities are related to the storage of radioactive waste, gained the necessary knowledge and experience when it comes to the process of conditioning disused sealed radioactive sources.

Figures 3, 4, 5 and 6 show a photo story taken from the official front page of the International Atomic Energy Agency.

Figure 3

Figure 4

Figure 5

Figure 6

Taking into account the international standards and requirements of the European Union, as well as the provisions of the Joint Convention to which Montenegro is committed, the radioactive waste storage operator has planned the manner in which it will repackage/condition compasses with radioactive radium 226Ra (7127 pieces), which are stored in a radioactive waste storage facility, with a total volume of about 1.5 m^3.

Namely, in the **First Report on the measures implementation of the Action Plan for the period 2017-2018 of the Strategy for protection against ionizing radiation, radiation safety and radioactive waste management for the period 2017-2021**, which was adopted by the Government of Montenegro at the session held on 26 December 2019, the Ministry of Sustainable Development and Tourism is in charge of planning financial resources for the provision of stainless steel containers for 2021, while CETI is in charge of packing compasses with radioactive radium into containers in the radioactive waste storage facility after the procurement and arrival of containers, taking into account that CETI decided for this type of storage, because due to the bulk and appearance of the compass, for now it is difficult to apply another conditioning strategy.

Regarding the conditioning of the **two remaining sealed radioactive sources of cesium** 137Cs that were left in their lead containers, because it was not possible to perform their conditioning earlier, **cooperation with the International Atomic Energy Agency will be considered to complete that activity.**

Montenegro is continuously engaged in the management of disused radioactive sources, smoke detectors that contain a radioactive isotope, radioactive waste, as well as orphan sources. **In the period between 1 October 2017 and 31 July 2020** LLC "Center for Ecotoxicological Research" **collected, safely and safely stored 344 smoke detectors,**

13 orphan sources and 7 disused radioactive sources taken from various practices, as shown in the Table No. 3.

Table No.3 Collected and stored radioactive sources for the period between 1 October 2017 and 31 July 2020

No.	Type of radioactive waste/ disused radioactive source	Radionuclide	Number of pieces of radiation source	Activity per unit (GBq)	Total Activity (GBq)
1.	Radioactive smoke detectors	Am^{241}	344	0,003	0.9
2.	Sources used in science and research	Ni^{63}	4	0.55	1.1
		Kr^{85}	2	0.46 i 0,9	1,36
3.	Source used in medicine	Sr^{90}	1	0,21	0,21
4.	Control of Scrap Metal /Orphan sources	Ra^{226}	13	-	-

Regarding further management of disused sealed radioactive sources and radioactive materials/waste, the Ministry of Sustainable Development and Tourism, in cooperation with relevant institutions, needs to prepare an Analysis on further management of disused sealed radioactive sources and radioactive waste, before adopting a new strategic framework.

12 Section K: General Efforts to Improve Safety

This Section provides a summary of the progress made between two Review Meetings of the Joint Convention, then presents challenges discussed and noted during the Sixth Review Meeting of the Contracting Parties, describes the level of their implementation and describes the current and future challenges that Montenegro faces in implementation of this international legal instrument.

In addition, a review of implemented **good practices and areas of good performance** will be provided. Further, this Section will provide an **overview of public participation and implemented advisory missions.**

In the reporting period, between two Review Meetings of the Contracting Parties to the Joint Convention, **Montenegro made significant progress**:

- **a good performance was achieved in the implementation** of the Strategy for protection against ionizing radiation, radiation safety and radioactive waste management for the period 2017-2021 with the Action Plan for the period 2017-2021;
- The **Strategy for Disaster Risk Reduction with the Dynamic Action Plan** for the implementation of the Strategy for the period 2018-2023 **was adopted**, at the Government session held on 21 December 2017;
- **two Action Plans were adopted** for the implementation of the Strategy for Disaster Risk Reduction for the period 2018/2019 and for the period 2020/2021;
- the **Radon Protection Program with the Action Plan** for the period 2019-2023 **was adopted**, at the Government session held on 20 December 2018;
- **The First Report for the period 2017-2018 on the Implementation of the Action Plan for implementation of the Strategy** for protection against ionizing radiation, radiation safety and radioactive waste management for the period 2017-2021 **was adopted,** at the Government session held on 26 December 2019;
- **the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security was approved** by the the Government of Montenegro on 16 January 2020, which was forwarded to the Parliament of Montenegro for adoption. Based on the Proposal of the Law, it is envisaged that in the period of three years from its adoption, bylaws necessary for the implementation of the Law will be drafted, as well as the Law on Liability for Nuclear Damage will be adopted;
- the **Law on ratification of the Joint Protocol on the Application of the Vienna Convention and the Paris Convention** ("Official Gazette of Montenegro - International Treaties", No. 012/18 of 31 December 2018) **was adopted;**
- the **Law on ratification of the Protocol of 2005 to the Protocol for the suppression of unlawful acts against the safety of fixed platforms located on the continental shelf** ("Official Gazette of Montenegro - International Treaties", No. 009/19 of 17 October 2019) **was adopted;**

- the **Law on ratification of the Protocol of 2005 to the Convention for the suppression of unlawful acts against the safety of maritime navigation** ("Official Gazette of Montenegro - International Treaties", No. 009/19 of 17 October 2019) **was adopted;**
- **the Agreement between the Government of Montenegro and the Council of Ministers of the Republic of Albania on Cooperation and Mutual Assistance in Emergency Situations** ("Official Gazette of Montenegro - International Treaties ", No. 11/18) **was adopted;**
- **the Agreement between the Government of Montenegro and the Government of the Republic of Turkey on Cooperation and Mutual Assistance in the Field of Emergency Situations** ("Official Gazette of Montenegro - International Treaties", No. 5/19) **was adopted**;
- **the Decision on publishing the Agreement between the Government of Montenegro and the Government of the Republic of Azerbaijan on Cooperation in the Field of Emergency Situations** ("Official Gazette of Montenegro - International Treaties ", No. 10/19) **was adopted;**
- **the Decision on the publication of the Agreement between the Government of Montenegro and the Government of the Republic of Bulgaria on cooperation in case of disasters** ("Official Gazette of Montenegro - International Treaties ", No. 7/20) **was adopted;**
- a **Memorandum of Understanding was signed** between the Government of Montenegro and the ITF Institution for Strengthening Human Security of the Republic of Slovenia in the field of mine action, destruction of conventional weapons and physical security and stockpile management;
- **a Memorandum of Cooperation was signed** on the implementation of the project "Cross-border fire protection";
- **a Memorandum of Understanding was signed** between the Ministry of Interior of Montenegro and the Norwegian People's Aid regarding the implementation of the Land Clearing Program from areas contaminated with cluster munition remnants;
- **instruments of ratification have been deposited** for the International Convention for the Suppression of Acts of Nuclear Terrorism;
- the National Platform for Disaster Risk Reduction **has been established;**
- **five conferences** of the National Platform for Disaster Risk Reduction **were organized;**
- several field and table top **exercises were organized;**
- the implementation of the European Commission's multi-beneficiary **IPA project JRODOS** "EuropeAid/140203/DH/SER/MULTI - „Strengthening the Capacity of the Western Balkans for Radiological and Nuclear Emergency Preparedness and Response: Technical Support for Decision Making“ **has started.**
- **a total of 33 national reports and declarations on nuclear materials** of Montenegro **were submitted** to the International Atomic Energy Agency within the framework of the implementation of the Treaty on the Non-Proliferation of Nuclear Weapons, the Agreement on Safeguards, the Additional Protocol and the Small Quantities Protocol;

- a **Plan was developed** to repack the compass with radioactive radium into stainless steel containers**;**
- **the Rulebook** on Internal Organization and Systematization of the Administration for Inspection Affairs **was adopted**, which envisages that the tasks of protection against ionizing and non-ionizing radiation are performed by **an additional three persons** who need to be employed;
- **the Rulebook** on the content and methodology of preparation, method of harmonization, updating and keeping studies of risk assessment on the basis of which protection and rescue plans are drawn up ("Official Gazette of Montenegro", No. 31/17) **was adopted**;
- **the Rulebook** on the Detailed Content and Methodology of Drafting, Method of Harmonizing, Updating and Keeping Protection and Rescue Plans ("Official Gazette of Montenegro", No. 34/17) **was adopted**;
- **the detection of orphan sources and the illicit trafficking of radioactive materials** have **been reported** to the International Atomic Energy Agency via ITDB database;
- inspections of the International Atomic Energy Agency **were carried out;**
- public consultations, debates and several round tables **were organized** in order to raise awareness;
- **activities on transparency were carried out** through participation in electronic and print media;
- **documents** adopted by the Government of Montenegro (strategies, programs, action plans, reports, proposal of the laws ...) **have been made public;**
- **344 fire detectors, 13 orphan sources and 7 disused radioactive sources** taken from various practices, **were collected and safely and securly stored**.

As for the **stated challenge** related to the strengthening of administrative capacities in the field of ionizing radiation protection, radiation and nuclear safety and security, **it still represents a challenge** that should be carefully and systematically addressed in the forthcoming period. In this regard, the development of a set of regulations based on the new Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security is a challenge.

Resolving the issue of managing the temporary storage facility where the remains of the aircraft engine are located, **is also a challenge in financial terms,** which Montenegro will try to solve in the forthcoming period with donor support.

Conditioning the remaining two sources of cesium **is also a challenge** that will require the support of the International Atomic Energy Agency.

As **a good practice**, Montenegro **emphasizes transparency and public participation** in decision-making when drafting strategic and legal acts.

Namely, public participation on issues of protection against ionizing radiation, and thus on issues of importance of safe radioactive waste management, decision-making, strategic documents, as well as when drafting laws and regulations, is regulated in Montenegro by the Governmental Decree on the procedure and manner of conducting public consultation in preparation of the laws ("Official Gazette of Montenegro", No. 12/12) and the Decree on the manner and procedure of cooperation between state

administration bodies and non-governmental organizations ("Official Gazette of Montenegro" No. 7/12). Mentioned Decrees were amended and consolidated within the **Decree on Election of Representatives of Non-Governmental Organizations to Working Bodies of State Administration Bodies and Conducting Public Debate in Preparation of Laws and Strategies** which has been adopted by the Government of Montenegro on 14 June 14 2018 („Official Gazette of Montenegro“, No. 41/18).

In addition, standards for public participation have been set on the basis of the Law on Free Access to Information ("Official Gazette of Montenegro", No. 44/12, 30/17) and the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), of which Montenegro is a full member. In order to support the Aarhus Convention in Montenegro, immediately after the ratification of this Convention, the implementation and establishment of Aarhus Centers was initiated, within both governmental institutions and non-governmental organizations, which is an excellent mechanism for access to information, participation of public in decision-making and access to justice in environmental matters. The Aarhus Centers Network in Montenegro consists of Aarhus Centers in the following cities: Podgorica, Niksic, Berane and Pljevlja. Arhus centers aim to facilitate the application of the Law on Ratifying the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) in the region, in order to strengthen the role of citizens and civil society in matters concern the environment.The offices of Aarhus Centers are places where citizens can be informed in good and timely manner about all environmental issues, and thus be involved in decision-making processes.

It is important to emphasize that when drafting legislation and regulations, the proposer of legislation and regulations organizes a forty-day public consultation in order to draft the best and highest quality legislation/regulations. During the public consultation, debates and tribunes, individual meetings and the like are held.

Also, tribunes, public consultation and round tables, both informative and educational, each of the above institutions, which make up the regulatory body, in accordance with its competencies, organizes, if necessary, in accordance with the above mentioned legal framework.

It should be emphasized that during the organization of these informative and educational events on raising the awareness of citizens about the importance of safe radioactive waste management, the presence of representatives of the institution that manages the radioactive waste storage, the Center for Ecotoxicological Research is always mandatory.

A good way of informing the public also existed during the implementation of the IPA2009 project "Management of sealed radioactive sources including radioactive lightning rods and strengthening the effectiveness of regulatory infrastructure in the field of radiation protection in Montenegro, Northern Macedonia and Kosovo (according to UNSCR 1244/1999)", as well as project MNE9004 "Radon Mapping in Montenegro and Improvement of the National Radon Protection System", MNE9005 "Radon Assessment and Reduction in Montenegrin Schools and Kindergartens" and INT91762 "Strengthening the Control of Disused Sealed Radioactive Sources in the Mediterranean".

The public was repeatedly informed through the media and accompanying material (information, flyers, brochures, posters, etc.) about the IPA2009 and INT91762 projects, about the removal and collection of radioactive lightning rods and other disused sealed radioactive sources, their transport and storage, and then their conditioning.

From the aspect of education, it should be emphasized that the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021 with the Action Plan for the period 2017-2021 and the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security **underlined the importance** of training and the constant strengthening of the capacity of employees in the field of ionizing radiation protection, which resulted in providing guidelines for the development of a legal framework that will provide the basis for the development of an appropriate training program for that staff. Therefore, strengthening the capacity of employees in the field of ionizing radiation protection ensures better information and education on all issues of ionizing radiation protection, and consequently on issues of radioactive waste management.

Experience so far has confirmed that the involvement of all relevant actors, including representatives of the NGO sector, provides better solutions in the field of ionizing radiation protection, radiation and nuclear safety and security and radioactive waste management, but also increases public acceptance of solutions. The manner of availability of information that is public, selection of relevant participants, as well as the method of solving problems in the decision-making process is very delicate and must be planned carefully and with sufficient flexibility, in order to allow adaptability to different situations. The involvement of all relevant actors plays an important role in administrative procedures and can influence final decisions.

The Nature and Environmental Protection Agency (NEPA) has its own website where information in the field of promoting safety and security culture can be found. In case of problems or interests of citizens, meetings with citizens or round tables are organized. Also, the Agency publishes issued permits on its website, as well as information on monitoring of radioactivity.

Also, a **significant step forward** is the introduction of terms and a special sections on promoting safety and security culture within the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for 2017 -2021 with the Action Plan for the period 2017-2021 - Section XV: Radiation and Nuclear Safety and Section XVI: Radiation and Nuclear Security.

For the purpose of providing better information to interested audience about the matters of ionising radiation protection, radiation and nuclear safety and security and radioactive waste management, particularly because of the development of the new legal framework, the Ministry of Sustainable Development and Tourism will develop, in cooperation with the Nature and Environmental Protection Agency and representatives of non-governmental sector, **the Communication Strategy in the field of ionising radiation protection**, under the auspices of international donors, which will include the manner of communication, target groups, organisation, topics to be presented, authoritative bodies, production of brochures and other publications, etc. This activity is envisaged to be developed as measure 51 of the Action Plan of the Strategy for Ionizing Radiation Protection, Radiation Safety and Radioactive Waste Management for the period 2017-2021, and is also envisaged by the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, which was sent to the Parliament of Montenegro for consideration and adoption.

In addition, the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security for the first time introduced a safety and security culture within the normative act, as a legal obligation imposed on holders of registration decisions, licenses and approvals to perform practices with radioactive sources and/or nuclear materials to continuously implement measures to improve safety and security

culture, or rules of conduct when applying ionizing radiation. This approach is a novelty in the legal framework dealing with protection against ionizing radiation.

The process of drafting the Proposal of the Law lasted for two years, during which an intensive Public consultation was conducted, which is stated in the **Report on the conducted public consultation, which is a publicly available document**. During the drafting of the Law and during the public debate, three events were held, as follows:

- **Round table** - consulting the interested public regarding the drafting of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, 26 February 2018;
- **Round table in cooperation with the Chamber of Commerce of Montenegro** where the draft Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security was presented, on 25 April 2019; and
- **Public tribune** on the draft Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security in the Ministry of Sustainable Development and Tourism, on 6 May 2019.

Interested parties submitted a total of 130 suggestions and 2 comments, of which 35 were accepted, 29 were partially accepted and 66 suggestions were not accepted. The reason for not accepting suggestions was that they were already an integral part of the text of this Draft Law or that they were not in accordance with the Directives and international standards. Within the public consultation, several meetings were held with representatives of institutions and members of the Working Group that worked on the drafting of the Law. During the drafting of the Law, the opinions of all competent institutions, organizations and professional associations were obtained, which were submitted to the Government of Montenegro during the consideration of the material.

Photo documentation from the held round tables and public discussions

Figure 1

Figure 2

The round table - consultations with the interested members of the public on the Draft Law on Ionising Radiation Protection, and Radiation and Nuclear Safety and Security, 26 February 2018 (Figures 1 and 2)

Figure 3

Figure 4

Figure 5

Figure 6

The round table organised in cooperation with the Chamber of Economy of Montenegro in which the draft Law on Ionising Radiation Protection, and Radiation and Nuclear Safety and Security was presented, 25 April 2019 (Figures 3, 4, 5)

The public discussion held on 6 May 2019 on the draft Law on Ionising Radiation Protection, and Radiation and Nuclear Safety and Security at the Ministry of Sustainable Development and Tourism (Figure 6)

Regarding the **Area of Good Performance**, Montenegro highlights activities of LLC "Center for Ecotoxicological Research" within which 344 smoke detectors with radioactive isotope, 13 radioactive orphan sources and 7 disused radioactive sources taken from various practices **were collected and safely and securly stored**.

Futher, **conducting exercises and establishing a national platform** for disaster risk reduction is also an **area of good performance**.

In the area of **implementation of advisory missions**, Montenegro plans to implement a **peer review mission after the completion of the new legal framework**. The importance of conducting the mission is emphasized in the Proposal of the Law on Ionizing Radiation Protection, Radiation and Nuclear Safety and Security, which prescribes the norm, as well as that the mission report will be publicly available.

Montenegro uses the opportunity to inform that it has so far implemented several expert and advisory missions, of which the following missions stand out:

- RASSIa Mission 2005; 31 October– 2 November 2005;
- EPREV 2008, 24 – 28 November 2008;
- IRRS 2008; 29 January – 1 February 2008;
- Support IAEA Mission 2009;

- Mission under project: C3-RER/9/104/09/01 NREP Review“ Support in the revision/amendment of the National action plan in the event of a radiation accident and relevant regulations“, 16-20. January 2012;
- IAEA Advisory Mission, 18-22 November 2013;
- INT9176/52/01 Expert Mission – „Conditioning of disused sealed radioactve sources (DSRS)“, 18-27 June 2014;
- IAEA Advisory Mission on the development of a decommissioning plan for the storage of radioactive waste and for a temporary storage facility, 6-10 November 2017.

In the forthcoming period in the field of ionizing radiation protection, radiation and nuclear safety and security, **the dedicated implementation of obligations defined by the Joint Convention, strategic and legal framework of Montenegro will continue**.

13 Annex - 1: List of Secondary Legislation

The following secondary legislation is applied on the basis of the *Law on Ionizing Radiation Protection and Radiation Safety*:

Nuclear safety

1. Decision on requirements for location, construction, trial operation**, commissioning**, operation and decommissioning of a nuclear facility (Official Gazette of FRY 42/97); (**Chapter V of this Decision is no longer in force**)
2. Decision on the method of and conditions for systematic testing of radionuclides presence in the environment surrounding a nuclear facility (Official Gazette of FRY 42/97);
3. Decision on the conditions to be met by persons working on tasks related to the management of production process in a nuclear facility and on tasks and duties related to supervision of such process (Official Gazette of FRY 2/98);
4. Decision on conditions for the trade and use of nuclear materials and the method of keeping the record of nuclear materials by the material balance areas (Official Gazette of FRY 42/97);

Radiation protection

5. Rulebook on intervention and derived intervention levels and measures of protection of the population, livestock and agriculture (veterinary practice, plant production and water management) in case of emergency (Official Gazette of FRY 18/92 and Official Gazette of Serbia and Montenegro 1/2003 – Constitutional Charter);
6. Decision on records of ionizing radiation sources and irradiation levels of the population, patients and persons exposed to ionizing radiation at work (Official Gazette of FRY 45/97);
7. Decree on systematic testing on the radionuclide content in the environment (Official Gazette of FRY 45/97);
8. Decision on conditions to be met by legal persons for carrying out measurements for assessment of the level of exposure to ionizing radiation of persons working with radiation sources, patients and general population (Official Gazette of FRY 45/97);
9. Decision on professional qualifications and health condition of persons working with ionizing radiation sources (Official Gazette of FRY 45/97);
10. Rulebook on application of ionizing radiation sources in medicine (Official Gazette of FRY 32/98,33/98);
11. Rulebook on conditions to be met by legal persons for the performance of systematic testing of the radionuclides content in the environment (Official Gazette of FRY 32/98, 67/02, 70/02);

12. Rulebook on conditions for the trade and use of radioactive materials, X-ray devices and other devices generating ionizing radiation (Official Gazette of FRY 32/98);
13. Rulebook on ionizing radiation exposure limits (Official Gazette of FRY 32/98);
14. Rulebook on limits of radioactive contamination of the environment and decontamination procedures (Official Gazette of FRY 9/99);
15. Rulebook on conditions to be met by legal entities for conducting decontamination procedures (Official Gazette of FRY 9/99);
16. Rulebook on detailed conditions for obtaining the license for radioactive waste storage management (Official Gazette of Montenegro 56/11 of 25 November 2011);
17. Rulebook on the method of collecting, keeping, processing and storing radioactive waste (Official Gazette of Montenegro 58/11 of 6 December 2011);

14 Annex – 2: List of international agreements/conventions to which Montenegro has acceded in the field of radiation and nuclear safety and security

1. Law on Ratification of the Vienna Convention on Civil Liability for Nuclear Damage ("Official Gazette of the Federal Republic of Yugoslavia – International Treaties", No. 005/77);
2. Law on Ratification of the Convention on the Physical Protection of Nuclear Material ("Official Gazette of the Federal Republic of Yugoslavia – International Treaties", No. 009/85-309);
3. Decree on Ratification of the Convention on Early Notification of a Nuclear Accident ("Official Gazette of the Federal Republic of Yugoslavia – International Treaties", No. 015/89-3);
4. Convention on Assistance in the Event of a Nuclear Incident or Radiological Emergency, Vienna ("Official Gazette of the Federal Republic of Yugoslavia – International Treaties", No. 004/91-29);
5. Law on Ratification of the Treaty on Non-Proliferation of Nuclear Weapons ("Official Gazette of Socialist Federal Republic of Yugoslavia – International Treaties", No. 010/70-313);
6. Treaty Banning Nuclear Weapon Tests in the Atmosphere, Outer Space and Under Water ("Official Gazette of the Federal Republic of Yugoslavia – International Treaties", No. 011/63-580);
7. Decree on Ratification of the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and Ocean Floor and in the Subsoil Thereof ("Official Gazette of the Federal Republic of Yugoslavia – International Treaties", No. 033/73-957);
8. Comprehensive Nuclear Test Ban Treaty with the Protocol ("Official Gazette of Serbia and Montenegro – International Treaties", No. 4/04-3);
9. Agreement on the Privileges and Immunities of the International Atomic Energy Agency (in force since 30.10.2006, by succession since 21of March 2007);
10. Statute of the International Atomic Energy Agency ("Official Gazette of the Socialist Federal Republic of Yugoslavia – International Treaties", No. 001/58-64);
11. Law on Ratification of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ("Official Gazette of Montenegro – International Treaties", No. 02/10 of 16 March 2010);
12. Law on Ratification of the Agreement between Montenegro and the International Atomic Energy Agency for the application of safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons, Additional Protocol to the Act on Ratification of the Agreement between Montenegro and the International Atomic Energy Agency for the application of safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons and the Protocol to the Agreement between Montenegro and the International Atomic Energy Agency for the application of safeguards in connection with the Treaty on the Non-Proliferation of Nuclear

Weapons (“Official Gazette of Montenegro – International Treaties”, No. 16/10 of 28 December 2010);

13. Law on Ratification of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (“Official Gazette of Montenegro – International Treaties”, No. 16/10 of 28 December 2010);
14. Law on Ratification of the Convention on Supplementary Compensation for Nuclear Damage (“Official Gazette of Montenegro – International Treaties”, No. 3/11 of 16 March 2011);
15. Law on Ratification of the Convention on Nuclear Safety (“Official Gazette of Montenegro – International Treaties”, No. 003/2015 of 26 March 2015);
16. Law on Ratification of Amendments to the Convention on the Physical Protection of Nuclear Material (“Official Gazette of Montenegro - International Treaties”, No. 004/16 of 25 March 2016);
17. International Convention for the Suppression of Acts of Nuclear Terrorism (“Official Gazette of Serbia and Montenegro - International Treaties”, No. 02/06-3);
18. Law on Ratification of the Agreement between the European Atomic Energy Community (EURATOM) and non-member states of the European Union on the participation of non-member states of the European Union to the Community System for the Early Notification and Information Exchange System for Radiological Emergencies. (ECURIE) (“Official Gazette of Montenegro - International Treaties” , No. 002/17 of 21 March 2017);
19. Law on Ratification of the Joint Protocol on the Application of the Vienna Convention and the Paris Convention (“Official Gazette of Montenegro - International Treaties”, No. 012/18 of 31 December 2018);
20. Law on ratification of the Protocol of 2005 to the Protocol for the suppression of unlawful acts against the safety of fixed platforms located on the continental shelf ("Official Gazette of Montenegro - International Treaties", No. 009/19 of 17 October 2019);
21. Law on ratification of the Protocol of 2005 to the Convention for the suppression of unlawful acts against the safety of maritime navigation ("Official Gazette of Montenegro - International Treaties", No. 009/19 of 17 October 2019).

15 Annex – 3: List of international agreements/memroandums to which Montenegro has acceded in the field of protection and rescue

1. Agreement between the Government of Montenegro and the Council of Ministers of Bosnia and Herzegovina on Cooperation in Protection against Natural and Civil Disasters ("Official Gazette of Montenegro - International Treaties", No. 14/12) - entered into force on January 14, 2013 Montenegro - International Treaties", No. 1/13);
2. Agreement between the Government of Montenegro and the Government of the Republic of Croatia on cooperation in protection against natural and civil disasters ("Official Gazette of Montenegro - International Treaties", No. 2/13);
3. Agreement between the Government of Montenegro and the Government of the Republic of Northern Macedonia on cooperation in protection against natural and other disasters ("Official Gazette of Montenegro - International Treaties", No. 7/09);
4. Agreement between the Government of Montenegro and the Government of the Hellenic Republic on cooperation in protection against natural and other disasters ("Official Gazette of Montenegro - International Treaties", No. 15/10);
5. Agreement between the Government of Montenegro and the Government of the Republic of Slovenia on cooperation in the field of protection against natural and other disasters ("Official Gazette of Montenegro - International Treaties", No. 11/10);
6. Agreement between the Government of Montenegro and the Government of the Republic of Serbia on cooperation in protection against natural and other disasters ("Official Gazette of Montenegro - International Treaties", No. 9/11);
7. Agreement between the Government of Montenegro and the Government of the Slovak Republic on cooperation and mutual assistance in case of natural and other disasters ("Official Gazette of Montenegro - International Treaties", No. 3/13) - entered into force on 2 July 2013 („Official Gazette of Montenegro - International Treaties", No. 6/13);
8. Agreement between the Government of Montenegro and the Cabinet of Ministers of Ukraine on cooperation in the field of protection against natural and other disasters ("Official Gazette of Montenegro - International Treaties", No. 9/14);
9. Agreement between Montenegro and the European Union on the participation of Montenegro in the Civil Protection Mechanism of the European Union ("Official Gazette of Montenegro - International Treaties", No. 3/15);
10. Memorandum of Understanding on the Institutional Framework for the Initiative for Disaster Prevention and Preparedness in Southeast Europe ("Official Gazette of Montenegro - International Treaties", No. 8/15);
11. Memorandum of Understanding of the Ministry of Internal Affairs - Directorate for Emergency Situations and the Ministry for Emergency Situations of the Republic of Armenia in the field of prevention and response to emergencies ("Official Gazette of Montenegro - International Treaties", No. 7/14);
12. Memorandum of Understanding between the Ministry of Interior - Directorate for Emergency Situations and the Presidency of the Council of Ministers of the Republic

of Italy - Civil Protection Service ("Official Gazette of Montenegro - International Treaties", No. 7/14);

13. Memorandum of Intent in the field of prevention and liquidation of emergency situations between the Ministry of Civil Protection of the Russian Federation, emergency situations and liquidation of the consequences of natural disasters and the Ministry of Internal Affairs of Montenegro;
14. Protocol on Explosive Remnants of War to the Convention on the Prohibition or Restriction of the Use of Certain Conventional Weapons with Excessive Traumatic Effect or Action Irrespective of the Purpose ("Official Gazette of Montenegro - International Treaties", No. 4/16);
15. Agreement between the Government of Montenegro and the Council of Ministers of the Republic of Albania on cooperation and mutual assistance in emergency situations ("Official Gazette of Montenegro - International Treaties", No. 11/18);
16. Agreement between the Government of Montenegro and the Government of the Republic of Turkey on Cooperation and Mutual Assistance in the Field of Emergency Situations ("Official Gazette of Montenegro - International Treaties", No. 5/19);
17. Decision on publishing the Agreement between the Government of Montenegro and the Government of the Republic of Azerbaijan on Cooperation in the Field of Emergency Situations ("Official Gazette of Montenegro - International Treaties ", No. 10/19);
18. Decision on the publication of the Agreement between the Government of Montenegro and the Government of the Republic of Bulgaria on cooperation in case of disasters ("Official Gazette of Montenegro - International Treaties ", No. 7/20);
19. Memorandum of Understanding between the Government of Montenegro and the ITF Institution for Strengthening Human Security of the Republic of Slovenia in the field of mine action, destruction of conventional weapons and physical security and stockpile management;
20. Memorandum of Cooperation on the implementation of the project "Cross-border fire protection";
21. Memorandum of Understanding between the Ministry of Interior of Montenegro and the Norwegian People's Aid regarding the implementation of the Land Clearing Program from areas contaminated with cluster munition remnants.