JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

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NATIONAL REPORT OF GREECE

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SECTION A. INTRODUCTION

Greece has signed the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management on 5 September 1997. The Convention has been ratified and entered into force on 16 March 2000.

The present report is the National Report of Greece for the 6th Review Meeting to the Convention, which will take place in 2018. The report has been prepared in accordance with the Guidelines regarding the Form and Structure of National Reports (IINFCIRC/604/Rev.3, 18 December 2014), established by the Contracting Parties under Article 29 of the Convention.

Greece has no nuclear power plants. Spent fuel management is therefore relevant only with the research reactor (GRR-1) at the National Centre of Scientific Research (NCSR) "Demokritos". GRR-1 is licensed for extended shutdown and the irradiated fuel stored in the reactor is covered by an agreement with the US Department of Energy for shipment back to the USA until 2019.

Radioactive waste in Greece originates from medicine, research and industry, including waste from the past operation of GRR-1 (resins, irradiated objects etc). In 2013 the Presidential Decree (PD) No. 122/2013 "Transposition of Council Directive 2011/70/EURATOM establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste" (177/A/12.08.2014) was issued for the transposition of the EC Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. Secondary legislative documents, namely for the national policy (Ministerial Decision (MD) 1858/2015) and national program (MD 2941/2015) for radioactive waste management, have been also published during the reporting period. In 2017, PD 122/2013 was significantly amended, including, among others the introduction of the general safety requirements for radioactive waste management covering the whole lifetime of a management facility and the definition of the various licensing stages. General safety requirement for disposal are also defined.

A facility for interim storage of radioactive waste ("New Radioactive Waste Interim Storage" (NRWIS)) exists at the premises of the NCSR "Demokritos" and operates under the Institute of Nuclear and Radiological Sciences & Technology, Energy & Safety (INRASTES) of the NCSR "Demokritos". The license of the facility includes interim storage of radioactive waste and disused radiation sources, low activity sources dismantling, characterization of radioactive waste, re-packaging and re-sorting of radioactive waste and radioactive sources and de-characterization and clearance of radioactive waste. The legislative basis for the licensing of the facility is the Radiation Protection Regulations (RPR) (Joint Ministerial Decision 1014 (ΦΟΡ) 94, Official Gazette No 216/B/6-03-2001) and the PD No.122/2013. IAEA safety guides are also used by EEAE for the review and assessment of the safety of the facility.

As it concerns sealed radioactive sources, a legal written declaration from the source manufacturer for accepting back the source after its useful life, is necessary prior to import of any radioactive source, as well as a legal written declaration from the source user for undertaking all financial and administrative provisions to export the source back to manufacturer or other licensed storage/recycling facility abroad. The import, export and transport of all radioactive sources are licensed by EEAE (with an exception of the radioactive smoke detectors, where special provisions apply).

In 2012, an Integrated Regulatory Review Service (IRRS mission) of the national regulatory framework, as well as of EEAE as the competent authority, was conducted. Radioactive waste

management was included in the scope of the mission. The mission report is publicly available at EEAE website. A thorough action plan has been being implemented since then. In 2016 an official request for the follow-up IRRS mission has been made to IAEA. The preparatory meeting took place in May 2017 and the follow-up mission has been scheduled for November of 2017.

SECTION B.
POLICIES AND PRACTICES

Article 32 Reporting, paragraph 1

(a) Spent fuel management policy

According to Article 4.1c of PD 122/2013, spent fuel shall be returned to a supplier or producer country, according to an agreement which shall be in place before the import of the fuel in Greece. Spent fuel final disposal in Greece is not presently considered as part of the Radioactive Waste Management National Policy. The spent fuel of the GRR-1 was returned to the USA in 2005. The irradiated fuel currently stored in GRR-1 is under an agreement with the US DoE for return to the USA until 2019.

(b) Spent fuel management practices

The irradiated fuel from the past operation of the GRR-1 is stored on site until the return shipment to the USA. Interim wet storage of the fuel of GRR-1 takes place in the fuel storage pool inside the reactor building. Storage of fuel follows radiation protection and safety regulation, and is covered by the current license of the reactor for the extended shutdown state. Shipment follows transport and safeguards legislation.

The nuclear material existing in Greece is subject to the control and regular inspection of IAEA and EURATOM Safeguards.

(c) Radioactive waste management policy

Radioactive waste in Greece originates from medicine, research - including the past operation of the GRR-1 - and industry. The vast majority of them are LL-W. A very small amount of waste that may be classified as IL-W, mainly some parts from the dismantled core of the reactor, also exist. The national policy for radioactive waste management in Greece is defined in MD 131207/I3/2015. General principles are also provided in PD 122/2013.

According to Article 4 “General Principles” of PD 122/2013, waste produced in Greece shall be disposed within the national territory, unless an agreement is in place for export of the waste abroad, in line with European Union legislative requirements. Until the establishment of a national disposal facility, waste shall be stored safely in a licensed storage facility (Article 4.1.b PD 122/2013).

As sealed radioactive sources are concerned, according to the National Policy (Article 5.6 of MD 131207/I3/2015), formal acceptance of the importer and manufacturer shall be in place prior the import of a sealed source to return the source back to the manufacturer after the end or its utilization period. For sources that it is not possible to be repatriated following the above provision, then according to Article 5.8 of the National Policy (MD 131207/I3/2015) , EEAE may implement, in a ten-year periodic basis, projects for the collection and export of radioactive sources. This option has been realized successfully in the past.

Other important elements of the national policy are as follows:

- The production of radioactive waste shall be kept as minimum as possible, through the appropriate measures, including recycling and reuse.

- The interdependencies among the various stages of radioactive waste management shall be taken into account.

- The management of radioactive waste shall be performed with safety, including in the long term with passive means.

- A graded approach shall be followed, in accordance with the magnitude and the characteristics of the potential hazards.

- The cost for the management of radioactive waste is borne by the waste producers.

- In all stages of radioactive waste management an evidence-based and documented decision making process shall be implemented.

Greece supports the idea of sharing of common activities, practical solutions and R & D programs in the context of agreements between the countries, taking into account the conditions specified in the EC Directive 2011/70/Euratom.

(d) Storage facilities

Short lived radioactive waste are stored on site until clearance and discharge (e.g. hospitals). The only facility in Greece, serving currently as a centralized facility for management and storage of radioactive waste that cannot be discharged on site, is the NRWIS. The facility was refurbished in 2003 and a new building built one year later. It is located within a safe and secure area of the NCSR "Demokritos" and is operated by INRASTES, which is also the operator of the GRR-1.

The NRWIS facility is used for safekeeping of disused /orphan sealed sources (without back-end agreement) and primary unconditioned radioactive waste. The sealed disused or orphan sources in the country – not being able to be exported - and radioactive waste produced within the NCSR "Demokritos" are transferred and temporarily stored accordingly, at prescribed locations in the NRWIS. Radioactive waste resulting from activities within the NCSR "Demokritos" is segregated at the origin based on: (i) the information given by the licensee of the particular activity; (ii) results of radiological survey and (iii) material composition.

(e) Radioactive waste management practices

Nuclear medicine and other research laboratories short lived waste are appropriately stored on site until decay and then are released to a waste disposal for non-radioactive waste or to a waste treatment facility for infectious waste. Special retention tanks might be required in nuclear medicine laboratories performing thyroid therapies with I-131. Liquid waste is disposed through the laboratory dedicated and marked pipelines to the national sewage system, in accordance to the specific levels for unconditional clearance provided in the Radiation Protection Regulations.

The management option for waste that cannot be cleared is storage in NRWIS. The NRWIS facility consists of two storage compartments for safekeeping of Low and Intermediate Level Waste. The first compartment is used for:

- radioactive waste produced from research activities at the NCSR "Demokritos" that should be kept for more than 2 years before sorting and/or clearance and

- historical radioactive waste after sorting and characterization.

The second room is for:

- disused/orphan sources and objects;

- radioactive and contaminated objects, mainly with alpha emitters, that are found within the country and characterized as radioactive waste, as for example: lightning rods using Ra-226,

parts of aircraft engines with thorium or items found in scrap metals, objects with luminance (Ra-226) material (e.g. vehicle speed meters, etc).

- radioactive waste from the GRR-1.

Besides the storage rooms, the facility operates also as radioactive waste characterization laboratory. The legislative basis for the licensing of the facility were the RPR, the PD 122/2013 and the MD 131207/I3/2015. Furthermore, the IAEA safety standards are considered as further guidance, especially the *IAEA Safety Standards WS-G-6.1, Storage of radioactive waste, safety guide*.

Regarding orphan sources, EEAE has taken provisions for the safe and secure interim storage of the orphan sources or sources that cannot be exported to their manufacturer or other source management facilities (e.g. in case of bankrupt, facility closure, etc). These provisions include an interim storage in the NCSR "Demokritos" facility, where the sources could be collected, temporarily stored and then exported for recycling. Furthermore, financial resources to cover intervention costs relating to the recovery and management of orphan or disused sources are provided to EEAE by the Greek Government.

A criterion of 100 days and 30 years half-life apply for distinguishing between very short lived and long lived RW, respectively. Very low level waste (VLLW) contains isotopes with half-life less than 30y and activities about two orders higher than the exempted values. Waste with radionuclides with higher half-life are considered as VLLW too (e.g. 226Ra), if the activity is very low. Examples are objects using 226Ra for luminance, smoke detectors with 241Am etc. Although classification is related to the disposal options – which have not been determined yet - and the availability and suitability of the storage procedures and infrastructure, the majority of waste in Greece are classified as VSLW, VLLW or LLW, due to their activities and form. A very few RW which concern regeneration bed resins and activated or contaminated objects in connection with GRR-1 operation have not been classified yet.

Presently, some waste is also stored in the building of the research reactor. This waste comprises historical waste, originating mainly from the past operation of the reactor.

Some disused sources are also stored by the owners on site in locations across the country waiting for final management i.e. export for recycling to an authorized facility (e.g. old - decayed teletherapy Co-60 source, sealed source found in scrap metal, smoke detectors, radioactive lighting rods). For all these sources a radiation source officer is assigned and the facilities hold a license, which is renewed every 3 or 5 years (depending on the facility). The financial and administrative responsibilities for the final management of such sources are assigned to the licensee.

The inventory of radioactive waste, sources and other material is maintained by EEAE within the national radiation protection database and includes the necessary basic information, i.e. facility, location, operator, persons in charge, quantities, form, activities, etc. EEAE performs on regular basis on-site inspections to verify the inventory of the material and compliance with radiation protection regulations.

SECTION C.
SCOPE OF APPLICATION

Article 3 Scope of Application

(a) As mentioned before in Sections A and B, spent fuel management in Greece concerns only the GRR-1. There are no reprocessing facilities in Greece.

(b) Regarding NORM management, relevant legislation is under development in the context of the transposition of the new European Basic Safety Standards Directive 2013/59/Euratom. At the moment, fertilizer industry phosphogypsum or other industries residuals and other contaminated materials (e.g. metal pipes) are stored on site (e.g. on stacks). From radiation protection perspective, all NORM materials are under monitoring by EEAE.

(c) Greece has not declared radioactive waste within military or defense program radioactive waste for the purposes of the Convention.

SECTION D.
INVENTORIES AND LISTS

Article 32 Reporting, paragraph 2

(a) Spent fuel management facilities

There are no spent fuel management facilities in Greece.

(b) Inventory of spent fuel

The inventory of the irradiated nuclear fuel stored in the GRR-1 is given in Annex I.

(c) Radioactive waste management facilities

As mentioned previously, NRWIS facility is the only facility in Greece that serves as a radioactive management facility in Greece, where sources and other radioactive waste originating from practices and activities across the country are stored. Sealed sources and radioactive waste collected in the country which cannot be stored on site for decay and discharge, as well the waste produced within the NCSR "Demokritos", are transferred and temporarily stored at specified locations in the NRWIS.

Nuclear medicine and other research and industrial laboratories waste is appropriately stored on site until decay or repatriation to the country of origin or transport for disposal or recycling and reuse to an authorized facility. On site storage of radioactive waste and sources is covered by the operational license of the facility. Disused sources or some other radioactive material (e.g. consumer products, such as lighting rods and smoke detectors) are also stored on site countrywide under radiation protection requirements verified by EEAE.

(d) Inventory of radioactive waste

The most recent data for the national inventory of radioactive waste are provided in Annex II.

EEAE maintains the national radioactive sources inventory including the following information:

- License holder: facility / laboratory / organization.
- Person in charge: Radiation protection officer / advisor or source officer.
- License: expiration – conditions.
- Location within the facility.
- Source device: manufacturer, type, etc.
- Source isotope, type – form, s/n.
- Source activity and reference date.
- Other available information from the licensee.

SECTION E.
LEGISLATIVE AND REGULATORY SYSTEM

Article 18 Implementing measures

The Joint Convention has been ratified and entered into force in Greece on 16 March 2000 by the Law 2824/2000 (90/A/16.03.2000) "Ratification of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management".

Article 19 Legislative and Regulatory Framework

In 2017, the PD 22/2013, which is the higher level legislative document pertaining directly to the management of radioactive waste was amended by the PD 91/2017. The amended legislation brings important modifications and additions in relation to applicable safety requirements for predisposal management and disposal, organizations and stakeholders involved in the management of radioactive waste, the licensing stages and regulatory supervision system.

A list of the laws and regulations relevant to this Convention are given below.

Radioactive waste

- Presidential Decree 91/2017, Legislative, regulatory and organizational framework for the responsible and safe management of spent fuel and radioactive waste and amendment of the Presidential Decree. 122/2013, Government Gazette Folio No. 130/A/01.09.2017;
- Ministerial Decision Π/112/214196/30.12.2015, National programme of spent fuel and radioactive waste management, Government Gazette Folio No. 2941/B/31.12.2015;
- Ministerial Decision 131207/Ι3/20.08.2015, National policy on the management of spent fuel and radioactive waste, Government Gazette Folio No. 1858/B/27.08.2015;
- Presidential Decree 122/2013, Transposition to Greek legislation of 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, Government Gazette Folio No. 177/A/12.08.2013.

Nuclear installations

The legislative framework with regard to nuclear installations is as follows:

- Act No. 854/1971, On the terms regarding the establishment and operation of nuclear facilities, Government Gazette Folio No. 54/A/18.03.1971;
- Presidential Decree No. 610, Establishing terms and procedures in licensing Public Power Corporation to construct a nuclear power plant on a specific site, Government Gazette Folio No. 130/A/23.08.1978;

In early 1980s, a decision was made to exclude nuclear power electricity generation. Therefore, the above two pieces of legislation have never been used and can be considered as archival pieces of legislation.

- Presidential Decree No. 60/2012, Establishing a National framework for the nuclear safety of nuclear installations (transposition of the Council Directive 2009/71/ Euratom of 25 June 2009), Government Gazette Folio No. 111/A/03.05.2012.

Nuclear research reactors

- Ministerial Decision 91175/31.05.2017, Amendment of the Decision no. P/112/305/2012 (B΄ 2877/26.10.2012) "Basic requirements – principles of nuclear safety and regulatory control of research reactors" (transposition of the Directive 2014/87/Euratom) Government Gazette Folio No. 1991/B/09.06.2017;

- Ministerial Decision P/112/305/2012, Basic requirements – principles of nuclear safety and regulatory control of nuclear research reactors, Government Gazette Folio No. 2877/B/26.10.2012.

Implementation of the International obligations

- Law No. 2480/1997, Ratification of the Nuclear Safety Convention, Government Gazette Folio No. 70/A/14.05.1997;
- Law No. 1636/1986, Ratification of the Convention on the physical protection of nuclear material, Government Gazette Folio No. 106/A/18.07.1986;
- Law No. 1758/1988, Ratification of the Protocol Amending the Convention on Third Party Liability on the Field of Nuclear Energy of 29 July 1960, as it was modified by the Additional Protocol of the 28 January 1964, Government Gazette Folio No. 44/A/10.03/1988;
- Law No. 1937/1991, Ratification of the International Convention in case of a Nuclear Accident or Radiological Emergencies, Government Gazette Folio No. 35/A/13.03/ 1991;
- Law No. 1938/1991, Ratification of the International Treaty on Early Notification in case of a Nuclear Accident, Government Gazette Folio No. 36/A/13.03.1991;
- Law No. 2824/2000, Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Government Gazette Folio No. 90/A/16.03.2000;

- Law No. 3990/2011, Amendment of the Convention of Physical Protection of Nuclear Materials, Government Gazette Folio No. 159/A/13.07.2011.

Safeguards and non-proliferation

- Law No. 437/1970, Ratification of the non proliferation treaty signed on the 1 June 1968, Government Gazette Folio No. 49/A/26.02.1970;
- Safeguards agreement between Greece and IAEA signed on 17.11.1972;
- Ministerial Decision No. 5408/E3/2362, Control on transfer of nuclear materials, armament and technologies affecting national Defense and Security, Government Gazette Folio No. 730/B/21.09.1993;
- Law No. 2805/2000, Ratification of the additional protocol, Government Gazette Folio No. 50/A/03.03.2000.

Radiological protection

- Law No. 4310/2014, Research, Technological Development and Innovation and other provisions (Chapter E' - Nuclear Energy, Technology and Radiation Protection – Greek Atomic Energy Commission (EEAE), Government Gazette Folio No. 258/A/08.12.2014;

- Ministerial Decision No. 1014/(FOR)94/2001, Approval of Radiation Protection Regulations, Government Gazette Folio No. 216/B/06.03.2001;
- Ministerial Decision No. 10828/(EFA)1897/2006, Control of high-activity sealed radioactive sources and orphan sources (transposition the Council Directive 2003/122/Euratom), Government Gazette Folio No. 859/B/10.07.2006;

- Ministerial Decision No. 9087(FOR)1004/1996, Operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas, Government Gazette Folio No. 849/B/13.09.1996.

The legislation on radiation protection is currently under extensive update in the context of the new European Basic Standards Directive 2013/59/Euratom transposition.

Establishment of the regulatory body

- Law No. 1733/1987, Transfer of Technology, inventions, technological innovation and establishment of the Greek Atomic Energy Commission, Government Gazette, Folio No. 171/A/22.09.1987;
- Presidential Decree No. 404/1993, Organization of the Greek Atomic Energy Commission, Government Gazette Folio No. 173/A/05.10.1993;
- Law No. 4310/2014, Research, Technological Development and Innovation and other provisions (Chapter E' - Nuclear Energy, Technology and Radiation Protection – Greek Atomic Energy Commission (EEAE), Government Gazette Folio No. 258/A/08.12.2014;

The organization of EEAE is currently under update (see below in legislation in progress).

Emergency preparedness

In order to cope with emergency situations, Greece has established the General Plan for Civil Protection. Annex "R" of this Plan is dedicated to radiological/nuclear emergencies

- Ministerial Decision 2739/1994, Regulation for public information in the event of a radiological emergency, Government Gazette Folio No.165/B/15.03.1994;
- Ministerial Decision No. 1299/2003, Approval of the General Plan for Civil Protection, under the Code Name Xenokratis, Government Gazette Folio No. 423/B/10.04.2003;
- Law No. 3491/2006, Establishment of the supporting team for Nuclear, Radiological, Biological and Chemical Threats, Government Gazette Folio No. 207/A/10.10.2006;
- Decision of the General Secretary for Civil Protection National Plan on CBRN threats, November 2011.

Emergency preparedness and response system and plans are under update as part of the new European Basic Safety Standards Directive 2013/59/Euratom transposition.

Other relevant legislation

- Law No. 3787/2009, Ratification of the Protocol amending the Convention on Third Party Liability in the field of nuclear energy of 29 July 1960, as amended by the additional protocol of 28 January 1964 and by the Protocol of 16 November 1982, Government Gazette Folio No. 140/A/07.08.2009;
- Presidential Decree No. 83/2010, Transposition of Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel into the Greek legislative framework, Government Gazette Folio No. 147/A/03.09.2010;
- Ministerial Decision Π/112/1057/2016/01.02.2016, Establishment of requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption, in compliance with the Council Directive 2013/51/Euratom of 22th of October 2013, Government Gazette Folio No. 241/B/09.02.2016.

Legislation in progress

- Transposition of the new European Basic Safety Standards Directive 2013/59/Euratom and update of the RPR is underway;
- Presidential Decree for the internal organization of EEAE (approved by the government and in the final stage of publishing);

Article 20 Regulatory Body

EEAE was initially established by an Act in 1954. The organization has been re-established with a different scheme in 1987. In 2014, with the Law 4310 (Government Gazette Folio No. 258/A/08.12.2014) titled "Research, Technological Development and Innovation and other provisions", a separate chapter, chapter E, titled "Nuclear Energy, Technology and Radiation Protection - Greek Atomic Energy Commission" is included (articles 39 - 46, article 90) the obsolete framework (Law 1733/1987, Legislative Decree 181/1974) is replaced by a new operation framework of EEAE. The new framework brings important improvements, regarding, inter alia, EEAE independence, enforcement means, inspectors role and inspection procedures, licensing authority and transparency enhancement. The new EEAE operation regime is in line with the international and European requirements for radiation protection and nuclear safety regulatory authorities, enhances the independent and effective regulation of this field and addresses some of the IRRS mission findings.

EEAE organizational structure was published in the form of a Presidential Decree in 1993. At present, a new Presidential Decree on the internal organization of EEAE has been approved by the government and is in the final stage of issuance. The proposed new organization chart is shown in Figure 1. Following IRRS mission findings, the new internal organization of EEAE provides for the operational separation between its regulatory functions and scientific and technical services. EEAE is governed by a seven-member Board.

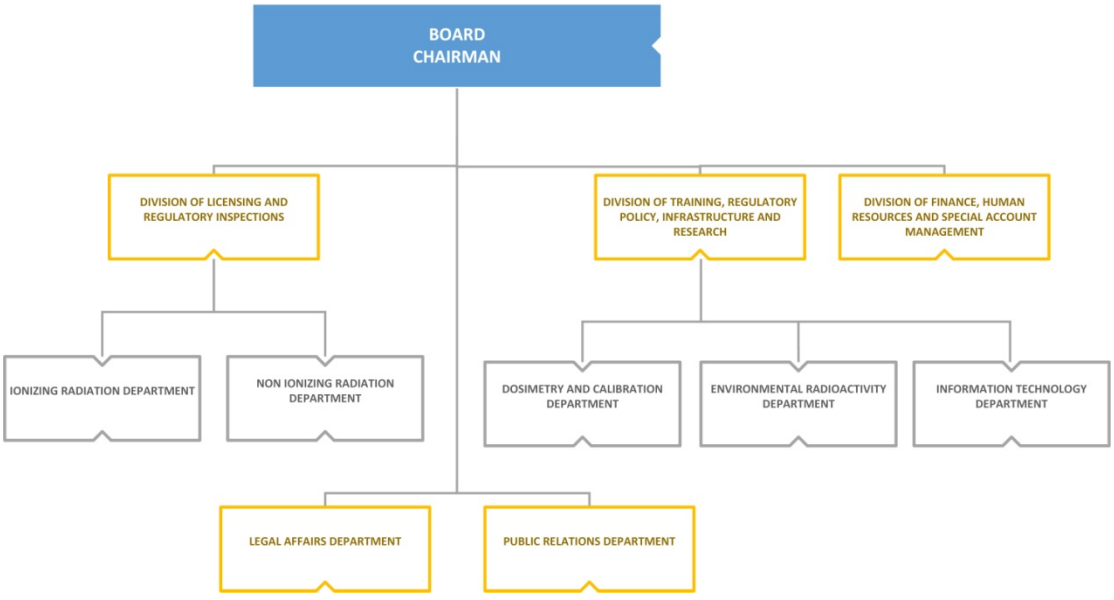

Figure 1. Organizational chart of EEAE

EEAE employs a sufficient number of about 75 qualified and competent staff to carry out its tasks. Most of EEAE personnel holds a degree of high level education and dispose specialized scientific expertise (M.Sc. and/or Ph.D.). Their continuous training, the participation in EEAE E&T activities

and the participation in scientific networks and international fora and activities is encouraged in order to gain the knowledge and experience required for the fulfillment of their tasks.

EEAE financial resources come from the public budget and from licensing fees and radiation protection services. The accounts and fiscal reports of the EEAE are subject to the control of the Audit Council. These data and fiscal reports are published on the EEAE website and submitted to the President of the Hellenic Parliament and the relevant Minister alongside the yearly report and the budget for the coming year.

EEAE implements an integrated management system; in 2013 it was certified in accordance with the requirements of ISO 9001:2008 standard, which incorporates all functions and accreditations of EEAE. In December 2016, the IMS was updated, fulfilling the requirements of the revised ISO 9001:2015. Specific aspects were further identified to be embedded in the integrated management system to respond to the IRRS findings, in line with IAEA safety requirements. An IRRS follow-up mission is scheduled for November 2017.

EEAE functions also include, personnel dosimetry, environmental radioactivity monitoring, emergency preparedness and response and non-ionizing radiation inspections. EEAE has an adequate level of infrastructure (radioactivity measurements laboratory, radiation detectors and other equipment and means) to meet the requirements of its role. EEAE provides also education and training activities in national and international level. In national level, a variety of training courses covering issues, such as occupational radiation protection, transport and emergency response, are provided. At regional and international level, EEAE is the IAEA Regional Training Centre (RTC) in English language in Europe on Radiation, Transport and Waste Safety, as well as on nuclear security. In 2015, EEAE requested and received a follow up EduTA mission (conducted in 2008), which confirmed the progress made since the initial mission years and indicated new challenges in education and training that should be faced in the future. Also, "Practical Arrangements between EEAE and IAEA" was signed in 2010, supporting EEAE as a Regional Training Center in Europe for nuclear security. This cooperation has been extended and validated through "Practical Arrangements between IAEA and the Government of the Hellenic Republic on cooperation in the area of Nuclear Security", signed during the International Conference on Nuclear Security held in Vienna in July 2013. Since 2003, EEAE hosts, the Postgraduate Educational Course on Radiation Protection and the Safety of Radiation Sources co-organized and co-funded by IAEA.

As concerns public information, actions taken since the last review meeting to improve communication with the public and transparency are provided in Section K.

SECTION F.
OTHER GENERAL SAFETY PROVISIONS

Article 21 Responsibility of the license holder

Article 7.1 of PD 122/2013 explicitly assigns the prime responsibility for the safety of facilities or activities related to the management of radioactive waste and spent fuel to the license holder. Waste management and all relevant actions undertaken by a facility are evaluated by EEAE as part of the licensing process.

Article 22 Human and financial resources

The RPR and the PD 122/2013 provide general requirements for human and financial resources of the licensee. Information for the available human and financial resources of the NRWIS storage facility were provided in the application for the operation license and found adequate in the regulatory review for the current activities in the facility.

For the import of sealed radioactive sources, licensing imposes that full financial provisions are made by the licensee for waste management and the return of the sealed sources to the manufacturers.

Article 23 Quality assurance

According to PD 122/2013 (Article 7.4), license holders shall implement integrated management program, including quality assurance program. Also, according to the RPR, the end-user (e.g. nuclear medicine or research laboratories, etc) should implement Quality Assurance program, which are subjected to regulatory inspection.

The QA program of NRWIS is based on:

1. Document Standardization and Codification.
2. Handling of Incoming and Outgoing Documentation.
3. Organization and Responsibilities of the personnel.

The most important elements of the QA include Records and Document Control System, Radioactive Waste Management Review, Personnel Meetings, Surveillance and Maintenance of Instrumentation, Sampling Quality Control, Handling, Storage and Shipping, Quality Assurance Records and Training Program.

Article 24 Operational radiation protection

All activities with ionizing radiation in the country shall be performed in accordance with the RPR. All radiation protection measures for the public, the occupationally exposed workers, the patients and the environment, are subjected to regulatory control.

For the activities within the scope of the Joint Convention (e.g. waste management facilities, interim storage, environmental radioactivity laboratory, etc), NCSR “Demokritos” and the GRR-1 apply radiation protection programs, which are subjected to regulatory control.

In particular, the radiation protection program of the NRWIS includes:

- General Principles and Policies;
- dose limits and Occupational Dose Constraints;
- radiation protection program commitments;
- activity Work Control, Radiation Work Permits;
- surveys and Monitoring;
- exposure Control;
- monitoring of External Exposure;
- monitoring of Internal Exposure;
- control of Radioactive Materials;
- instrumentation;
- dose Estimates;
- radioactive Waste Management;
- identification of Waste Streams;
- clearance Criteria and Methods to Verify Clearance;
- occupational Safety;
- physical Security;
- emergency Plan.

EEAE provides the individual monitoring of the occupationally exposed workers in the country and keeps the national records. The workers of NRWIS are submitted to medical surveillance program.

Article 25 Emergency preparedness

According to the legislation, in each facility there is an internal emergency preparedness plan in case of a radiological accident or event, which is subjected to regulatory review. Moreover, in PD 122/2013 (Article 7.3) is provided that license holders shall implement measures for the prevention of accidents and for the mitigation of their consequences, in order to protect the workers and the public from significant exposures to radiation.

The emergency plan for the NRWIS facility is based on the assessment of the possible hazards that might arise: (i) during the RW management activities; (ii) in case of fire; (iii) in case of larceny. The assessment consists of tracking and recording the dangers and risks that threaten the safety and health of the personnel, the general public and the environment.

Current national emergency plans

The General Civil Protection (Emergency) Plan (GCPP) under the code name "Xenokratis" concerns any emergency situation in the Greek territory (Ministerial Decision No. 2025, Approval of the General Plan for Civil Protection, under the Code Name Xenokratis, Government Gazette Folio No. 12/B/19.01.1998). It has been revised and re-approved in 2000, after the legislative restructuring of the responsibilities related to facing national disasters of all kinds and the establishment of the General Secretariat for Civil Protection. After governmental approval, it was published in the Government Gazette in 2003 (Ministerial Decision No. 1299, Approval of the General Plan for Civil Protection, under the Code Name Xenokratis, Government Gazette Folio No. 423/B/10.04.2003). In particular, Annex "R" of the GCPP concerns the response to an emergency situation from important and extensive radioactivity contamination due to nuclear accidents taking place abroad and is designed to provide response to accidents involving the release or potential release of radioactive substances.

Infrastructure devoted to emergency planning includes a mobile laboratory, measuring and detection systems, radioactivity measurement laboratories across the country, individual monitoring laboratory for external and internal radiation, protective equipment, independent communication systems, specialized vehicle with the possibility of carrying and stabilizing shielded radioactive sources, computer codes for atmospheric dispersion and transport of radioactivity and a telemetric network of monitoring stations covering the national territory (real time data are available on the web) .

Emergency preparedness and response system is currently under update in the context of the transposition of the new European Basic Safety Standards Directive 59/2013/Euratom.

Article 26 Decommissioning

GRR-1 is owned and operated by NCSR "Demokritos", a governmental institution. The reactor is licensed for extended shutdown, with the current license expiring in 2019. There are no plans submitted to EEAE, concerning the future of the reactor, including its decommissioning. Licensing for decommissioning or re-operation of the reactor include both a Ministerial Decision.

SECTION G.
SAFETY OF SPENT FUEL MANAGEMENT

Article 4 General safety requirements

As explained previously, Greece has only one research reactor (GRR-1), which is in extended shutdown. There are no plans for a nuclear power program or for additional research reactors.

Spent fuel from GRR-1 has already been returned to the US DoE. Remaining irradiated fuel is covered by an agreement for return to the USA by 2019. The safety of the stored fuel, in terms of criticality, was addressed adequately in the safety documentation submitted for the extended shutdown license. Regular surveillance of the pool, the fuel and the water quality is also in place.

Article 5 Existing facilities

GRR-1 is an open-pool, light water moderated and cooled reactor with MTR plate-type fuel elements. The core has been dismantled and the main pool of the reactor is empty from water. The remaining irradiated fuel is stored in the fuel interim wet storage pool inside the reactor building, which has a capacity of 57 assemblies.

Article 6-8 Siting of proposed facilities, Design and construction of facilities, Assessment of safety of facilities

It is not foreseen to design or construct new facilities.

Article 9 Operation of facilities

The irradiated fuel from the past operation of GRR-1 is stored in the fuel storage pool inside the reactor building. The pool is an underground stainless-steel, 1.6m x 2.6m and 4m deep tank, offering 57 storage positions arranged in five groups. Cadmium sheets are properly positioned between storage positions. The tank is filled with demineralized water the quality of which is under surveillance. Recirculation of the water through a resin-type mixed-bed ion exchanger ensures the appropriate pH and conductivity levels. The tank is secured by steel covers.

Article 10 Disposal of spent fuel

All spent fuel from GRR-1 is to be transferred to the USA, according to an agreement with the US Department of Energy for shipment until 2019. Fuel purchases are required to be based on similar arrangements with foreign nuclear companies/organizations that will guarantee the return of spent fuel to the country of origin for storage or reprocessing (Article 4.1.c, PD 122/2013).

SECTION H.
SAFETY OF RADIOACTIVE WASTE MANAGEMENT

Article 11 General safety requirements

General Safety Requirements, pertaining in particular to radioactive waste management, are provided in Article 7 of PD 122/2013. These requirements define the responsibilities of the license holders regarding:

- The periodic safety assessment of the facility and activity.
- The demonstration of the safety of the facility, covering all stages of the facility lifetime (development, operation, decommissioning, closure), including normal conditions and events or accidents considered in the facility design.
- Measures for accident prevention and mitigation of their consequences, including the verification of the safety barriers and of the organizational procedures, in order to avoid significant exposure of the workers and the public.
- Integrated management systems and quality assurance.
- Adequate human and financial resources.

The amended PD provides additional safety requirements for both predisposal management and disposal of radioactive waste, throughout the different stages of a facility lifetime, including siting, design and construction, operation, maintenance, modification and utilization, and decommissioning or closure of facilities. The stages provided for authorization of a predisposal radioactive waste management facility are:

- Feasibility license
- Siting License
- Design approval
- Operation license
- Decommissioning license
- Approval for the release of the site from regulatory control

More detailed procedures for the different licensing stages shall, according to Article 16 of PD 91/2017 be determined by a Ministerial Decision. Drafting of the Ministerial Decision is underway.

Article 12 Existing facilities and past practices

The operation license of the existing NRWIS interim storage facility was last renewed in 2016. As concerns the overall safety of the facility, areas, where further improvements shall be made, have been identified and included in the current license as additional terms. Among them, the radiological hazards to the public, although are considered to be limited, it has been requested to be further assessed quantitatively in the context of a safety analysis, taking into account the guidance provided in IAEA safety standard WS-G-6.1, Storage of Radioactive Waste, IAEA, 2006.

Additional conditions of the license have been imposed in relation to the continuous improvement of the safety (e.g. enhanced fire protection measures) and physical protection of the facility (e.g. in an integrated security system of the NCSR "Demokritos").

As mentioned previously the safety of the on-site storage of institutional radioactive waste and sources countrywide is evaluated as part of the operation licensing and through inspections.

Article 13-15 Siting of proposed facilities, Design and construction of facilities, Assessment of safety of facilities

Basic safety requirements for site evaluation, design and construction and safety assessment of a facility for the management of radioactive waste and for disposal are provided in Article 13 and Article 14 of PD 122/2013, respectively. Currently, there are no plans for construction of new storage and disposal facilities in Greece.

Article 16 Operation of facilities

Basic safety requirements pertaining to the operation of a radioactive waste management facility are provided in par. 5 and par. 1 of Article 13 of the amended PD 122/2013. These paragraphs provide for general requirements and define important elements of safety such as operating limits and conditions, financial and human resources (properly educated and continuously trained personnel) and reporting, analysis and corrective actions in case of events. Further requirements exist regarding safety policy and safety culture, management system and recording, emergency plans, management and mitigation of events and accidents, radiation protection and physical protection. Relevant IAEA standards, such as WS-G-6.1, Storage of Radioactive Waste, IAEA, 2006 were also taken into account. The safety of the NRWIS was evaluated taking into account this guidance. Currently, terms have been imposed to NRWIS for further improvement of its safety level (see also Article 12 above).

Article 17 Institutional measures after closure

There are no disposal facilities in Greece.

SECTION I.
TRANSBOUNDARY MOVEMENT

Article 27 Transboundary movement

The transboundary movement of the spent fuel shipped to the US is covered by the provisions of the agreement with the US Department of Energy.

Shipment of radioactive waste from Greece to other European countries or to a third country is addressed in Article 4 and 20 of the amended PD 122/2013 and follows the provisions of the European legislation, according to which an existing agreement shall be in place and EEAE shall inform accordingly the EURATOM prior to shipment. Shipment is allowed to countries that have a relevant agreement with EURATOM or they are contracting parties to the Joint Convention and have a national radioactive waste management program and existing management facilities that can handle the type of the shipped waste.

For the prevention of illicit trafficking of radioactive or nuclear material the country's entrance points are equipped, with the contribution of the IAEA, the U.S. Department of Energy, the Greek Customs Department and the EEAE, with radioactivity detectors. In particular, networked fixed systems for radioactivity detection are installed at the major customs offices and portable radioactivity detectors have been distributed to the custom offices in the country. EEAE is responsible for the operation of the network and maintenance of the systems.

In the same context, radioactivity detectors – pagers and portable spectrometers have been distributed to the Green Lines (border police and Coast Guard).

The customs local detection systems have been networked; the central server includes a database that includes the alarms triggered on any custom alarm system.

SECTION J.
DISUSED SEALED SOURCES

Article 28 Disused Sealed Sources

In Greece there are no manufacturers of sealed sources; all sealed sources are imported. According to national legislation enacted in 1990, in order to import a sealed radioactive source, the foreign supplier must make the commitment to take back the source when it is decommissioned. This is also provided by MD No. 10828/(EFA)1897/2006.

A program exists for collecting all disused sources, imported into the country before 1990. Up to now, the old "legacy" sources have been collected and exported to a country with the appropriate infrastructure for recycling according to a program started by the EEAE in 2003 and financed by the government. Mainly industrial and medical sources of different types and activities were exported.

EEAE maintains the National Database, including information about installations, laboratories, equipment, sources, occupationally exposed workers, etc.

In addition to the provisions taken to prevent the smuggling of radioactive sources or nuclear material into the country (section I, art. 27), radioactivity detectors (portals) have been installed in the scrap yards and foundries to monitor the scrap entering these facilities and detect any hidden sealed sources. In case of a finding, the persons in charge communicate immediately with EEAE, so as to perform a secondary control and collect the object.

SECTION K.
GENERAL EFFORTS TO IMPROVE SAFETY

Challenges identified in the previous meeting

Two challenges were identified for Greece in the previous review meeting. Actions taken to address those challenges are described below.

Implementation of the National Program road map: The National Program for radioactive waste management was issued in the legislative form of a Ministerial Decision (Joint Ministerial Decision 2941/2015/Π/112/214196/31.12.2015) in 2015.

The key milestones of the National Program are:

a. Appointment, composition and functioning of the National Committee Radioactive Waste Management (EEDRA);

b. updated and verification of the Inventory and Classification of Radioactive Waste;

c. establishment of the National Temporary Storage and Radioactive Waste Management Facility;

d. project for the identification, collection, and export for recycling of radioactive sealed sources and radioactive materials;

e. decisions on national options for the management and disposal of radioactive waste.

According to the legislation (PD 122/2013 amended by PD 91/2017 and MD 2941/2015) the aforementioned activities and projects start in September 2017.

Decommissioning Plan for GRR-1: There are no plans for the future of the reactor yet, neither a decommissioning plan has been submitted. The magnitude of its future waste stream has been roughly estimated and included in the National Program (see Table 3, Annex II).

Safety issues

Improvements, regarding the format and content of the safety documentation of the interim storage facility NRWIS, have been identified during the facility licensing. In particular, a safety analysis, including a qualitative accident analysis and specification of the waste acceptance criteria of the NRWIS, have been requested from the operator during the renewal of the license. One of the most important hazard, due to the location of the facility, had been identified to be an external fire. This hazard has been evaluated and measures have been identified in collaboration with the National Fire Service for the minimization of the impact of a fire on the facility.

International peer reviews

As provided in the previous report Greece completed an IRRS mission in 2012. The report of that mission has been made publicly available. Moreover, Greece had reported the main outcomes of the mission, in particular pertaining to radioactive waste management in the previous report and during the previous review meeting. In 2016, a follow-up mission was requested by Greece. The preparatory meeting took place in May 2017 and the follow-up review meeting has been scheduled for November 2017. The main outcomes of the mission, especially regarding radioactive waste will be shared during the forthcoming Joint Convention meeting in May 2018.

Other open issues-Challenges

Completion of the transposition of the new European Basic Safety Standard Directive (EC Directive 59/2013/EURATOM) brings significant improvements in the general radiation protection area and is on going.

Implementation of the National Program for radioactive waste and definition of the up-to-end management option for each waste stream is an ongoing effort.

Developments since the last review meeting

The important developments since the last review meeting can be summarized as follows:

- New legislation for updating the internal organization of the EEAE, which takes into consideration the findings of the IRRS mission, is in its final stage of governmental approval;
- a number of legislation documents were issued pertaining to radioactive waste management regime;
- the transposition of the new European Basic Safety Standards (EC Directive 2013/59/Euratom) is in progress, leading to extensive update of the present regulatory and legislative framework. The primary legislation has been prepared and the public consultation has been completed. Comments are currently under evaluation;
- further actions were taken to improve transparency and communication with the public;

Openness and transparency

Since the last review meeting, actions have been taken to improve communication with the public and transparency including, inter alia:

- Stakeholders and information meetings on the new European Regulatory Framework (BSS, nuclear safety and radioactive waste directives);
- promotion of safety culture through sharing lessons learned from radiological events: EEAE systematically disseminates findings and lessons learned from radiological incidents/accidents by posting them at EEAE website;
- research reactor and radioactive waste interim storage facility licenses, including the evaluation reports prepared by EEAE, are available at EEAE website. Inspection reports for the reactor are also available at EEAE website;
- public electronic consultation of the national regulatory framework for the safe management of spent fuel and radioactive waste;
- design and development of a new website, www.eeae.gr. The new web profile of EEAE is an information portal on radiation, covering issues of interest for all visitors. It was developed in house, emphasizing on the access to information and online services;
- open data policy. By applying Law no. 4305/2014 (Government Gazette Folio no 237/A/2014), providing for the public disposition and further use of public documents, information and data, within the framework of integrating the provisions of European Directive 2013/37/EU, EEAE recorded all documents and data at its disposal and issued a related decision.

SECTION L.
Annexes

Annex I: Inventory of irradiated fuel assemblies stored in the reactor building

Assembly no.	U-235 (gr)	Burn-up (%)
601	200,67	9,50
602	188,62	14,92
603	218,81	1,37
604	187,63	15,45
605	192,69	13,14
606	188,36	15,02
607	195,29	11,96
608	193,74	12,68
609	197,39	11,04
610	197,95	10,73
611	194,33	12,40
612	199,52	10,03
613	198,58	10,41
614	206,23	6,98
615	208,14	6,09
616	209,82	5,34
617	218,51	1,41
618	219,04	1,22
6C01	89,23	34,02
6C02	105,14	18,03
6C03	108,33	14,86
6C04	113,10	10,09

Annex II: Inventory of radioactive waste

Table 1: Resins in drums

Location: Interim storage facility of NCSR "Demokritos"
Form Resins
Origin: Past activities of GRR-1, NCSR "Demokritos"
Processing options: Characterization in progress. Disposal option has not been decided

Waste classif.	Storage room	Type	# Drums	Volume, L/drum	Weight, kg/drum	Total Weight, kg	Total activity, MBq	Nuclides (main)	Maximum C_A / drum, Bq/g	Total MBq
VLLW & LLW	A, B (*)	Resins	158	200	100	15800	245	Ag-108m	4,8	15
								Cs-137	160	213
								Eu-152	2	4
								Co-60	6,2	13

(*) : LLW are stored in building A (56 drums) & VLLW in building B (102 drums). Reference date for activities 2011.

Table 2: Radioactive waste produced by GRR-1

Location: NCSR "Demokritos"
Type: Sediment, liquid and activated/contaminated objects
Origin: Past activities of GRR-1, NCSR "Demokritos"
Processing options: Characterization in progress. Disposal option has not been decided, yet

Solid Waste

Waste classif.	Storage room	Form	# Drums	Volume, L	Total activity, kBq	Nuclides (main)	Total Activity kBq
LLW	NCSR "D"	Sediment	1	2	300	Ag-108m	50
						Cs-137	
						Eu-152	30
						Co-60	220

Reference date for activities 2011

Solid Waste

Waste classif.	Storage room	Form	# Drums	Volume	Dose rate at 5 cm	Nuclides (main)	Total Activity kBq	Remarks
ILW	B	Metal parts from GRR-1	1 (cement shielding)	< 0.01 m^3	~ mSv/h	Co-60	(*)	Metal objects (e.g. screws) from GRR-1
LLW	A	Objects in drums	53	10 m^3	< 4 μSv/h	Co-60, Cs-137, Ag-108m, Eu-152	(*)	From GRR-1
Historical Waste	B	Objects in drums	100	20 m^3	< 50 μSv/h	(*)	(*)	From GRR-1 and connected facilities
Historical Waste	B	cemented sludge	50	10 m^3	~ 100 nSv/h	Cs-137	(*)	From GRR-1 and connected facilities
Historical Waste	NCSR "D"	Objects in drums	50	10 m^3	~ 100 nSv/h	(*)	(*)	From GRR-1 and connected facilities

(*) to be defined

Liquid waste

Waste classif.	Storage room	Form	# Tanks	Volume, L	Total activity, MBq	Nuclides (main)	Total Activity kBq
VLLW	Liquid waste storage tanks	Water	15	8944	5,70E+05	H-3	5,70E+05
						Cs-137	47
						Co-60	51

Table 3: Expected decommissioning radioactive waste from GRR-1

Location: GRR-1 of NCSR "Demokritos"
Type: Activated /contaminated objects
Origin: Decommissiong of GRR-1. Additional RW may be produced during decommissioning activities.
Processing options: Characterization in progress. Disposal option has not been decided

Solid Waste

Waste classif.	Location	Form	# Items	Mass (tons)	Dose rate at 5 cm	Nuclides (main)	Total Activity kBq	Remarks
EW	GRR-1	Metal parts	(*)	30	(*)	Co-60, Cs-137, Ag-108m, Eu-152	(*)	Aluminium, Steel and Stainless Steel
VLLW	GRR-1	Metal parts	(*)	28	(*)	Co-60, Cs-137, Ag-108m, Eu-152	(*)	Aluminium, Steel and Stainless Steel
VLLW (mixed)	GRR-1	Lead	(*)	5	(*)	(*)	(*)	Lead (at the thermal column)
LLW	GRR-1	Metal parts	(*)	0.6	(*)	Co-60, Cs-137, Ag-108m, Eu-152	(*)	Aluminium, Stainless Steel
LLW (mixed)	GRR-1	Lead	(*)	1.8	(*)	(*)	(*)	Lead inside the experimental tubes
ILW	GRR-1	Metal parts	(*)	0.3	(*)	Fe-55, Ni-63, Co-60	(*)	Aluminum, Staintless Steel (support structure of the core and parts of the control rods)
ILW (mixed)	GRR-1	Be blocks and part of the control rods	(*)	0.2	(*)	Fe-55, Ni-63, Co-60, Ag-110m, Ag-108m, Cd-109, H-3	(*)	Be and Ag-Cd-In
(*)	GRR-1	Graphite	(*)	15	(*)	(*)	(*)	Partitioning will be done in the future
(*)	GRR-1 store room	Contaminated objects	(*)	< 1 m^3	tens μSv/h	(*)	(*)	Objects from maintenance, house-keeping, etc

(*) to be defined

Table 4: Radioactive material

Location: Interim Storage NCSR "D and on-site at other facilities (storage)
Type: Consumer products, Instruments, contaminated objects
Origin: Past activities of operator, illicit traficking
Processing options: Characterization in progress. Disposal option has not been decided

Location	Type	Origin	# items / quantity	Activity	Nuclides
Interim Storage NCSR "D	Lighting rods	Collected from sites	154	~ 50 MBq/item	Am-241, Ra-226
	Smoke detectors	Collected from sites	3107	~ 0.03 MBq/item	Am-241
	Consuler products, intsrumens, objects	Vehicle instruments, lamps, depU blocks	2298	various (*)	Ra-226, Am-241, Th-232, Sr-90, depU
	Contaminated soil, objects	Illegal actions, illicit traficking	3 drums	(*)	Pu-238, Pu-239, Pu-240, Pu-241
	Metal plates with evaporated Pu-238	Illegal actions, illicit traficking	250	(*)	Pu-238, Pu-239, Pu-240, Pu-241. Evaporation on metal plates
On-site (in facilities, countrywide)	Lightning rods	Activities of user	472	50 MBq/item	Am-241, Ra-226
	Consuler products, intsrumens, objects	Vehicle instruments, lamps	10 drums	(*)	Ra-226
	Insineration Ash	Scrap metal industry	50-100 m^3	(*)	Cs-137
	Contaminated objects with NORM	Excavation industry	100 m^3	Max activity concentration, C_A =5E3 Bq/g	Ra-226

(*)to be defined

Table 5: Disused sources

Status: Raw material
Processing options: Awaiting for recycling

Location	Source Category	# sources	Total activity, MBq	Nuclides
Interim Storage NCSR "D, Building A	1			
	2	1	2,18E+07	Co-60
	3	42	4,53E+05	Cs-137, Am241/Be, Sr-90, Co-60
	4	7	1,67E+03	Co-60, Kr-85, Cs-137
	5	209	4,99E+04	Co-60, Cs-137, Ir-192, Sr-90, Mbn-54, Ra-226, Am-241, C-14, Pm-147
On site (facilities countrywide and in GRR-1 storage room)	1	3	5,22E+08	Co-60
	2			
	3	4	5,92E+05	Am-241, Pu-239/Be
	4	57	6,07E+05	Cs-137, Am-241, Ra-226, Th-232, Eu-152
	5	210	2,03E+05	Ra-226, Ni-63, Co-60, Cs-134, Cs-137, Sr-90, Kr-85, Pb-210, U-238, Am-241, Hg-203, Mn-54, Ba-133, Na-22, Co-57
Total		533	5,46E+08	

Table 6: Orphan sources

Location: On site
Type: Orphan surces stored on site, where they detected (metal industies, scrap metal facilities, customs)
Origin: Scrap Metal
Processing options: Characterization in progress. Disposal option has not been decided, yet

Location	Source Category	# sources / devices	Form	Total activity, MBq	Nuclides
On site, at locations / facilities	1				
	2	1	Sealed source	1,85E+07	Cs-137
	3				
	4				
	5	160	objects		Ra-226, Am-241, Th-232, Sr-90, depU
Total		**161**		**1,85E+07**	

(*) to be defined

Annex III: Overview matrix

Type of Liability	Long term management policy	Funding of Liabilities	Current practice/ Facilities	Planned facilities
Spent Fuel	Return to the country of origin	Government	Irradiated fuel wet storage at GRR-1	None
Nuclear Fuel Cycle Waste	N/A	N/A	N/A	N/A
Non-power waste	On site storage, decay and release for short live waste. Longer lived waste are stored until final disposal solution.	Licensee, Government	On site storage, decay and release for short live waste. Longer lived waste are stored until final disposal solution	National RW Interim Storage and Management Facility Options for disposal to be investigated
Decommissioning Liabilities	Decommissioning waste stream to be included in the national program waste streams. Decommissioning plan is required by law	Licensee, Government	No plans have been submitted	
Disused Sealed Sources	Return to the manufacturer. Orphan sources are stored in National RW Interim Storage and Management Facility until final disposal solution	Licensee, Government	Return to the manufacturer. Orphan sources are stored in RWIS	National RW Interim Storage and Management Facility Options for disposal to be investigated
Mining & Milling waste	N/A	N/A	N/A	N/A

List of abbreviations

EEAE	Greek Atomic Energy Commission
EW	Exempted Waste
GRR-1	Greek Research Reactor. The only one research reactor in Greece, owned by NCSR "Demokritos".
ILW	Intermediate Level Waste
INRASTES	Institute of Nuclear and Radiological Sciences & Technology, Energy & Safety of the NCSR "Demokritos".
LLW	Low Level Waste
LRMM	Laboratory for Radioactive Material Management of INRASTES
MD	Ministerial Decision
NCSR "Demokritos"	National Center for Scientific Research "Demokritos"
NRWIS	New Radioactive Waste Interim Storage
PD	Presidential Decree
RPR	Radiation Protection Regulations (MD No. 1014(ΦΟΡ)94/2001, Approval of Radiation Protection Regulations, Government Gazette Folio No. 216/B/06.03.2001)
VLLW	Very Low Level Waste

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