REPUBLIC OF CROATIA

NATIONAL REPORT

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

3rd report

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Section A. Introduction

The Republic of Croatia signed the "Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management" (Joint Convention) on 9 April 1998, and ratified it on 5 February 1999. The first National Report on implementation of the obligations under the Joint Convention was prepared at the beginning of 2003, and the Republic of Croatia participated at the Review Meeting later that year. The second National Report was prepared in 2005 also followed by an active participation at the Review Meeting in 2006.

This National Report contains updated information on matters covered in the second report, focusing on the safety advancement achieved in the meantime. The Report has the same structure as the previous one and in each section new developments are presented together with the most important previous statements which still hold true.

Also, the issues raised during the last Review Meeting are given adequate consideration, which is briefly discussed in the second part of the Section K.

Major developments in the period after the second report were:

a) advances in the national SF and RW management policy,
b) further advancement of the regulatory framework, and
c) advances in specific RW management practices.

Advances in the national policy

Croatian SF and RW management strategy has recently been formulated as an official document, which is now in the final stage of legislative approval. Major features of the strategy are:

a) RW presently in the Republic of Croatia, as well as future waste streams originating from medicine, research, and industrial activities not related to nuclear fuel cycle, will be managed in one central national storage facility (CNS) that will be established soon (new regulation on RW, described in the Section E, specifies that CNS site should be designated within six months).
b) The Republic of Croatia will undertake all reasonable activities to ensure that SF and RW originating from the NPP Krško is safely and efficiently managed in joint programs with Slovenia. The available options should be examined and evaluated in the revisions of the joint "Program of NPP Krško Decommissioning and SF & LILW Disposal" (NPPK Program).

First revision of the NPPK Program should be completed during the year 2009. The terms of reference (ToR) for this revision were negotiated and modified for nearly one

year and the revision began in September of 2008.

The present version of the NPPK Program (the first joint Slovenian-Croatian program of the NPP decommissioning and its waste management) was completed in 2004, and it was described in appropriate detail in the previous report[1].

This NPPK Program was a limited revision of the previous NPP decommissioning plan (adopted by Slovenia alone), but it also introduced specific SF and RW disposal concepts and then integrated NPP decommissioning and waste management into interrelated scenarios with well-defined time schedules.

The primary purpose of the first NPPK Program version was to make costs estimates, based on rational and mutually acceptable scenarios. Therefore it did not attempt to make choices for which sensitive political decisions would be necessary, but it did lay out some premises for further negotiations which were accepted by both countries:

- all LILW from the NPP Krško operation and decommissioning will be disposed of in one near-surface repository, either in Slovenia or in Croatia;
- spent fuel will be disposed of in one deep geological repository, either in Slovenia or in Croatia – or it will be exported into a third country;
- until disposal or export, spent fuel will be dry-stored in an independent storage facility on unspecified location, either in Slovenia or in Croatia.

The costs of the integrated decommissioning and waste management programs were estimated and a financing model was proposed: each country should accumulate one half of the planned amount, through annual instalments by national power companies into the respective national decommissioning funds.

The Slovenian fund had already been operating for about ten years, and the NPPK Program estimates provided the basis for recalculation of annual contributions by the Slovenian power company.

The Croatian fund was to be established soon, based on annual contributions from the Croatian power company in the amount directly specified by the NPPK Program. This fund became fully operational in the spring of 2008, while the specified power company contributions were kept on a dedicated national account in the meantime.

According to the recommendations of the NPPK Program itself, as well as of its reviewers, the ToR for its first revision requires that new program should be prepared more thoroughly than the first version in order to significantly reduce the margins of uncertainty.

More specifically, the purpose of the revision is to prepare new NPPK Program that will:

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[1] The entire document "Program of NPP Krško Decommissioning and SF & LILW Disposal" is available at www.apo.hr, and the Executive Summary of the Program was reproduced in the Annex III of the second National Report.

a) incorporate relevant developments since 2004 into the Program modules and scenarios,
b) improve the level of detail and reliability of the Program, both technically and financially, and
c) propose updated and more accurate cost estimates and appropriate financing models.

The objectives of the revision are:

a) Preparation *ab ovo* of new decommissioning module, which will be NPP Krško specific and independent of the previous studies. The module will have the form of a Preliminary Decommissioning Plan (PDP), complying with the IAEA-recommended format and priorities

b) Elaboration of predisposal and disposal options for RW and SF;

- predisposal management of RW must be elaborated and optimal solutions proposed,
- LILW management must be reviewed in the light of new developments, particularly in Slovenia (where considerable progress has been made since 2004 towards establishment of a LILW repository); all relevant options should be examined and evaluated,
- SF management (interim storage as well as disposal) should be described in greater detail than in the previous Program version.

c) Development and evaluation of integrated NPPK Program scenarios:

- the referent scenario from the 2004 version should be re-evaluated for cost comparison, and new variants or alternatives may be investigated,
- the possibility of the NPP Krško life extension (10 and 20 years) should be introduced in order to facilitate timely decision-making,
- the possibility of diverging interests of the contracting parties should also be analyzed in time to make rational decisions on further development of the NPPK Program (e.g. waste division and separate management).

According to the present proposal of the Croatian SF and RW management strategy, it is expected that this revision of the NPPK Program will lead, in particular, to more specific and definite decisions regarding management of LILW from NPP Krško.

Further advancement of the regulatory framework

While the regulatory framework development during the previous period was primarily aimed at the separation of nuclear safety from the radiation protection and establishment of corresponding regulatory bodies, within the last three-year period the focus was on further strengthening of the regulatory capabilities and incorporation of the EU directives into Croatia's legal system.

The nuclear safety act from 2003 introduced the State Office for Nuclear Safety as the regulatory body for nuclear practices, removing this regulatory function from the Ministry of Economy and thus resolving the issue of potential conflict of interest. Similarly, though not to the same extent, the regulatory authority for radiation protection was transferred from the Ministry of Health to the State Office for Radiation Protection, which was achieved by amendments to the radiation protection act also in 2003.

The changes introduced by the revision of radiation protection act in 2006, and by subordinated ordinances, were aimed to further improve the security of radiation sources and to make the legal framework fully compliant with the EU legislation. The new regulation on radioactive waste from 2008 finally replaced the old SFRY regulation cited in the previous report. Together with the new ordinance on nuclear facilities (also from 2008), it completed Croatian regulatory framework in such way that references to legal acts inherited from the former state are no longer needed in this field.

These regulatory developments are described in more detail in the Section E, whereas the list of other relevant laws and regulations is given in the Annex I.

Advances in specific RW management practices

Within the limited scope of RW management practices in the Republic of Croatia, significant advances have been achieved in recent years:

a) The inventory of the only active Croatian RW store at the Institute Ruđer Bošković was fully characterized several years ago and the results were presented in the last report. In the meantime, in the only other Croatian storage facility, the inactive temporary store of the Institute for Medical Research and Occupational Health, spent radioactive sources were characterised, conditioned, and secured. The details are given in the Section D of this Report.

b) Management of sealed sources, and in particular control of orphan sources, has been advanced through projects supported by the IAEA. More details are given in the Section J.

Section B. Policies and Practices

Policies

The Strategy for Management of Radioactive Waste and Spent Fuel has been developed and is now in the phase of adoption. A brief preliminary account is given in the Introduction.

Spent fuel management practices

Spent fuel management has not been practiced in the Republic of Croatia.

Radioactive waste management practices

Only small quantities of radioactive waste have been managed in the Republic of Croatia. The storage facilities for the waste which could not be disposed of as communal waste after brief on-site decay storage are described in the Section D. Also, plans for a new storage facility are discussed elsewhere in this report.

Radioactive waste categorization

The Regulation on radioactive waste, described in the Section E, defines solid, liquid and gaseous radioactive waste. For solid radioactive waste, the categories are defined in the following table:

Radioactive waste class	**Typical characteristics**
Exempt and cleared radioactive waste	Activity concentrations or total radioactive waste activity at or below prescribed exemption or clearance levels
Low level short lived radioactive waste	Radioactive waste containing radionuclides with half-life less than 100 days which will decay below clearance levels within 3 years
Low and intermediate level radioactive waste	Radioactive waste containing radionuclides with half-life less than 30 years and activity concentration or total activity which will remain above prescribed exemption or clearance levels 3 years after their creation, and having a heat generation rate below 2kW/m^3
2.1 Short lived waste	Radioactive waste containing radionuclides with half-life less than 30 years (limitation of long lived alpha emitting radionuclides to 4000 Bq/g in individual waste packages and to an overall average of 400 Bq/g in the total waste volume)

2.2 Long lived waste	Radioactive waste activity concentrations exceeding the limits for short lived waste
High level radioactive waste	Radioactive waste thermal power above 2kW/m^3 and activity concentrations exceeding limits for short lived waste

The table closely resembles the TABLE II from the IAEA safety guide 111-G-1.1, except it introduces the 'Low level short lived radioactive waste' as a separate class.

Section C. Scope of Application

Regarding the obligations under Article 3:

a) The Republic of Croatia has not declared reprocessing to be part of spent fuel management;
b) The Republic of Croatia has not declared any waste that contains only naturally occurring radioactive material and does not originate from the nuclear fuel cycle as radioactive waste for the purposes of the Convention; and
c) The Republic of Croatia has not declared any spent fuel or radioactive waste within military or defence programs as spent fuel or radioactive waste for the purposes of the Convention.

Section D. Inventories and Lists

Spent fuel facilities and decommissioning of nuclear facilities

No spent fuel is presently in the Croatian territory or under its effective jurisdiction.

No nuclear facilities are presently in operation or being decommissioned in the Republic of Croatia.

Radioactive waste management facilities

No waste from nuclear cycle is presently in the Croatian territory or under its effective jurisdiction. The waste accumulated in the Republic of Croatia originates from medicine, research and industrial applications in the country, entire accumulated quantity not exceeding several tens cubic meters. Import and management of radioactive waste not

originating in the Republic of Croatia are explicitly prohibited by the radiation protection act described in the Section E.

There are two storage facilities for radioactive waste, both located in Zagreb, within national research institutes: Institute Ruđer Bošković (IRB) and Institute for Medical Research and Occupational Health (IMI). There are no radioactive waste repositories.

IRB Temporary Storage of Radioactive Material (TSRM)

TSRM at the IRB is presently the only active Croatian storage facility accepting all generated radioactive waste or discovered waste from past activities.

The facility consists of two rooms at different levels. Improvements regarding security had been made and were reported in the 2nd report. Access to both levels of the building and its perimeter had been reinforced and an intrusion detection system had been installed. Alarm system is remotely controlled. In addition, building is under video surveillance enabling monitoring both from the central alarm station of the Institute and from the office of the general manager of the facility.

Inventory of TSRM is listed in 8 tables presented in Section L Annex II. A notable portion of the inventory consists of spent radium sources which were conditioned on the upper level and are now stored in the lower level of the TSRM.

The IMI storage

IMI hosts an old storage facility for disused sources. Facility is no longer in operation since last radioactive source was received 10 years ago. Most of the sources are of low activity (lightning rods, fire detection sources, medical sources and industrial gauges). Remediation works of storage area with conditioning, characterization, segregation and packing in lead containers of found radioactive sources were undertaken in June 2006 with full assistance of IAEA. Work was performed under SORP supervision. Overall, more than 600 sources were recovered and characterised along with approx. 500 l of contaminated materials.

^{226}Ra sources were transferred to TSRM at the IRB. The rest of the conditioned sources are temporary stored at this facility pending transfer to the future National storage facility. Further segregation and volume reduction of the waste is planned before final placement in National storage.

IMI storage facility is under 24-hour surveillance with CCTV system.

A new inventory list of the sources placed in storage was compiled. The inventory of IMI storage is presented in Section L Annex II

Radioactive waste inventory

State Office for Radiation Protection (SORP) has established a database with the central

RW inventory. TSRM at the IRB reports every change of the inventory and pursuant to its legal obligations submits annually a complete inventory list to the SORP. A summary of the data, representing reasonably detailed spent sources inventory, is reported annually to the *IAEA Net Enabled Waste Management Database* (NEWMDB).

Section E. Legislative and Regulatory System

The basic laws

The basic laws which together constitute spent fuel and radioactive waste management regulatory framework are[2]:

a) The "Act on Ionising Radiation Protection and Safety of Ionising Radiation Sources" (Official Gazette 64/06), in further text the "Radiation Protection Act", and
b) The "Act on Nuclear Safety" from 2003, in further text the "Nuclear Safety Act" (already discussed in the previous report).

This "Radiation Protection Act" replaced former "Act on Protection against Ionizing Radiation" passed in 1999 and amended in 2003, which had already reflected the most relevant international recommendations, in particular the ICRP Publication No. 60 and the general requirements of the IAEA Safety Series No. 115 "International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources" (BSS). As can be seen from its full name, the new Act puts additional emphasis on the safety of radiation sources.

The "Radiation Protection Act" consists of 59 articles in 27 chapters: General provisions, Principles of protection against ionising radiation, Systematic testing and monitoring of ionising radiation in the environment, Safety measures for sources of ionising radiation, Dose limits for the population, Age limit for exposed workers, Dose limits for exposed workers, Protection during pregnancy and breastfeeding, Medical irradiation, Personal dose measurement, Technical competency, Medical examinations, Requirements concerning premises and devices, Authorisations, Derogation from the requirement of obtaining authorisation, Establishment and application of measures for protection of exposed workers and supervision of work posts, Person responsible for protection against ionising radiation, Liability, Import, export, transport and transit of ionising radiation sources, Approved technical service, Emergency event, Radioactive waste and

[2] English translations for Croatian laws and regulations, which have been systematically introduced in the process of harmonization with EU legal framework, differ from the terms used in two previous national reports. Laws adopted by the Parliament are now called acts, and subordinate regulations are generally called ordinances (the term regulation is retained only for those promulgated by the Government).

spent sealed radioactive sources, State Office for Radiation Protection, Fees, Supervision, Penal provisions, Transitional and final provisions.

Basic principles of justification of practices, optimization of protection and safety, and of limitation of individual doses are explicitly formulated as provisions of the law. Authorization for all practices with ionizing radiation is obligatory except for excluded or exempted sources of ionizing radiation. The conditions and procedure for authorization are formulated as provisions of the law, as well as the principles for exemption.

Primary responsibility for implementation of prescribed radiation protection measures has the user, i.e. the person or legal entity who obtained the authorization for conducting certain practice. By Article 38 of the act, the holder of the authorisation must provide for and bear the costs of disposal of radioactive waste as well as of spent sealed radioactive sources and ionising radiation sources not intended for further use. Article 40 regulates the situation when the costs of disposal at the moment of enforcement are not recoverable from the party obligated to bear such costs.

By Article 39, import, processing, storage and disposal of radioactive waste not originating in the Republic of Croatia are explicitly prohibited.

Article 41 defines the tasks of the State Office for Radiation Protection (SORP). Among other tasks, it approves the carrying out of practices involving sources of ionising radiation, approves procurement, import, export, transport and transit of ionising radiation sources, authorises the use of ionising radiation sources, approves and supervises the professional operations of approved technical services, The act retained the supervision and enforcement of the radiation safety measures as the responsibility of the Sanitary Inspection Department of Ministry of Health, which is also in accordance with the "Act on Sanitary Inspection".

Radioactive waste management is addressed in a very brief section of the "Radiation Protection Act", in which it stipulates that conditions for as well as the method of disposal of radioactive waste, spent sealed radioactive sources and ionising radiation sources which are not intended for further use shall be prescribed by a regulation of the Government of the Republic of Croatia at the proposal of the minister competent for health. The regulation was adopted in April 2008.

The "Nuclear Safety Act" is even more concise than the "Radiation Protection Act", and also heavily relies on the international conventions and IAEA recommendations. It consists of only 37 articles grouped in seven chapters: General provisions (definitions), Nuclear safety (conditions for a nuclear practice, including safety and protection requirements; quality assurance, monitoring, staff qualifications, records-keeping and emergencies including technical support centre), State Office for Nuclear Safety (SONS), Financial resources, Supervision, Penalties and Transitional and final provisions.

The "Nuclear Safety Act" defines nuclear practices instead of nuclear facilities. These practices involve nuclear material (as defined in the IAEA Statute) and specified equipment (as defined in the "Protocol Additional for application of the Safeguards in connection to the Non-Proliferation Treaty"). All spent fuel facilities are clearly under jurisdiction of this law. The Act defines radioactive waste repositories as the facilities for disposal of RW from nuclear fuel cycle. Although this definition has no further use in the law itself, its intention is clarified in subordinated regulations, which extend the

jurisdiction of the "Nuclear Safety Act" to all waste management facilities with significant content of RW from nuclear fuel cycle.

Article 8 of this Act requires that in the process of determining the siting, planning, construction, operation and decommissioning of a facility in which a nuclear practice is to be performed, the conditions for nuclear safety and protection set forth in this law and in conventions and other international agreements ratified by the Republic of Croatia, as well as international recommendations and standards in the area of nuclear safety, must be met. These conditions have in the meantime been elaborated in great detail in a subordinated regulation described below.

Administrative supervision of the implementation of the "Nuclear Safety Act" and regulations adopted on the basis of this law shall be carried out by the State Office for Nuclear Safety. Inspections based on this law shall be carried out by inspectors from the State Office for Nuclear Safety (nuclear safety inspectors).

Based on Articles 3, 11-16 and 18, the nuclear material or specified equipment user shall be solely responsible for safety and protection in performing a nuclear activity. He is also responsible for emergency preparedness, environmental monitoring, education of personnel and record-keeping. All these requirements are specified in more detail in the regulations.

The holder of the license is also liable for any nuclear damage according to the "Act on Third Party Liability for Nuclear Damage". It is the responsibility of the regulatory body to control that the licensee fulfils these regulations.

The most important subordinated regulations

Most regulatory requirements on radioactive waste and spent fuel management are contained in three new regulations:

- "Regulation on conditions and method of disposal of radioactive waste, spent sealed radioactive sources and ionising radiation sources which are not intended for further use" (OG, 44/08), in further text "Regulation on radioactive waste",
- "Ordinance on the requirements for the design, construction and removal of structures accommodating sources of ionising radiation or in which practices involving sources of ionising radiation take place" (OG, 99/08), "Ordinance on design and construction",
- "Ordinance on performing nuclear activities" (OG, 74/06), "Ordinance on nuclear activities", and
- "Ordinance on conditions for nuclear safety and protection with regard to the siting, design, construction, use and decommissioning of a facility in which a nuclear activity is performed" (OG, 71 /08), "Ordinance on nuclear facilities".

The first one is subordinated to the “Radiation Protection Act”, and it is primarily concerned with RW not originating from nuclear fuel cycle. The second one gives general conditions for design and removal of the structures accommodating sources of ionising radiation, also applicable to the RW storage. The other two are subordinated to the “Nuclear Safety Act”, and regulate management of spent fuel and RW originating from nuclear fuel cycle.

The “Regulation on radioactive waste” consists of 58 articles in 7 sections: General provisions, Classification of radioactive waste, Clearance and exemption from control, Disposal of radioactive waste, spent sealed radioactive sources and ionizing radiation sources which are not intended for further use, Disposal of spent sealed radioactive sources and ionizing radiation sources which are not intended for further use, Method of keeping records on radioactive waste, spent sealed radioactive sources and ionizing radiation sources which are not intended for further use and Transitional and final provisions.

In "General provisions", it empowers SORP to grant authorizations for carrying out practices involving radioactive waste or spent sealed radioactive sources, gives details of the authorization procedure, assigns responsibilities for the safety, operational radiation protection and protection of the environment.

The Regulation provides classification for solid waste, criteria for clearance and exemption, conditions and limit values for discharge into environment, methods for collection, treatment and packaging, requirements for protective containers, their labelling and records keeping. Liquid and gaseous waste treatment is addressed as well.

The responsibility to decide upon the construction RW repository is assigned to the Government. For such a facility, preparation of an environmental impact study is explicitly requested. However, the details are left to be described in other, less general documents.

To minimize waste accumulation in the Republic of Croatia, the Article 48 of the Regulation obliges user to contractually bind the manufacturer to consent to the return of sealed sources with activities which will longer than 10 years after delivery remain above 100 MBq.

As a prerequisite for authorization, a program of application of measures for protection against ionising radiation including the security and quality assurance program and the plan of measures for prevention and elimination of potential consequences of an emergency event is required.

The “Ordinance on nuclear activities” lays down the procedure for notification and licensing, and regulates the form and content of the applications. The nuclear activities include spent fuel management as well as storing and disposing “*low level and medium level radioactive waste originating from the reactor in quantities requiring the application of nuclear safety and protection measures*”.

The intent to perform nuclear activities must be notified to the State Office for Nuclear Safety. The application for the issue of a licence to perform nuclear activities shall be submitted to the SONS one year after the notification at the earliest. When submitting the application, the legal person should, depending on the types of nuclear activities, attach certain documentation. The SONS must notify the legal person of its decision

within two years. In the case of negative evaluation of the documentation, the SONS shall refuse the application for license.

The SONS shall keep the register of nuclear activities in the Republic of Croatia as official records of nuclear activities.

The "Ordinance on nuclear facilities" establishes conditions for nuclear safety and protection with regard to the siting, design, construction, use and decommissioning of a facility in which a nuclear activity is performed.

Chapter I contains a lengthy list of definitions, introducing the term nuclear facility as *"a facility in which a nuclear activity is performed*". Nuclear facilities include plants for the processing as well as storage and disposal facilities for "*spent nuclear fuel or high level radioactive waste originating from a reactor*", and also storage and disposal facilities for "*low and intermediate level radioactive waste in the part where radioactive waste originating from a reactor is being stored (or emplaced) in quantities that require the application of nuclear safety and protective measures*".

In Chapter II, conditions for nuclear safety with regard to the siting of a nuclear facility are regulated. Siting of all facilities shall be based on general exclusion criteria. Additionally, siting of nuclear power plants shall be based on particular exclusion criteria for nuclear power plants and comparative criteria for nuclear power plants. Also, siting of a waste disposal facility for low and intermediate level radioactive waste in the part where radioactive waste being emplaced originates from a reactor shall be determined based on particular exclusion criteria and comparative criteria. The Government of the Republic of Croatia issued a conclusion about determining aforementioned criteria in 1992.

Similarly, in Chapter III conditions for nuclear safety in designing facilities are regulated. For designing all facilities in which a nuclear activity is performed, general conditions are given. Along with the general conditions, particular conditions for nuclear reactors must also be met. Also, along with the general conditions, particular conditions for designing RW disposal facilities are listed. Location and building permits for building facilities in which a nuclear activity is performed or permits for decommissioning of such facilities shall not be issued without a certificate of the SONS concerning compliance of the preliminary and of the main design with the aforementioned conditions.

Finally, in Chapter IV, conditions for nuclear safety for a facility with regard to the construction, commissioning, operation, decommissioning and closure, are regulated. Again, a list of general conditions for these activities is provided. Along with the general conditions, particular conditions for facilities with nuclear reactors are given for the construction, commissioning, operation, decommissioning and closure. Also, along with the general conditions, the principles for closure of the location of a RW disposal facility are given.

The "Ordinance on nuclear facilities" is a document which contains very detailed specifications along with the requirements to observe recognized international recommendations and good practices. For example, the introductory article of the chapter on facility design requires (in first three paragraphs) that design must meet dozens of general and particular conditions listed in subsequent articles, and then the paragraph 4 adds: *"In designing all facilities in which a nuclear activity is performed under the conditions stipulated in paragraphs 1, 2 and 3 of this Article, the recommendations and standards*

of the International Atomic Energy Agency shall apply."

Other recent legislation

In addition to the above laws and regulations, which cover most aspects of RW and SF management addressed in Joint Convention, a substantial portion of the regulatory framework relevant to this field has been novelated or developed since the previous report.

Most of these new documents are subordinated or related to the "Radiation Protection Act" and the "Nuclear Safety Act":

- "Ordinance on special requirements which expert organizations must fulfil in order to perform certain activities in the field of nuclear safety" (OG 74/06);
- "Ordinance on the conditions and measures for protection against ionising radiation for carrying out activities with radioactive sources" (Official Gazette 125/06), in further text "Ordinance on protection measures";
- "Ordinance on Limits of Exposure to Ionizing Radiation and on the Conditions of Exposure in Special Circumstances and in Emergency Situations"(OG 125/06), "Ordinance on exposure limits";
- "Ordinance on the manner and procedure for supervision during import or export of material for which there is justified suspicion of contamination by radionuclides or of containing radioactive sources" (OG 114/07);
- "Ordinance on the methods, extent and time intervals of personal exposure monitoring for exposed workers and patients, surveillance of the sources of ionizing radiation and work conditions, on measuring of prescribed elements and quality control, on control of radioactive contamination of persons, objects, environment, rooms and air in the rooms in which the practices are performed or the radioactive sources are stored, on contents of the measurement and surveillance reports, reporting procedure and on obligation of records and registries maintenance, their contents, maintenance methods and periods of retention" (OG 127/07);
- "Ordinance on the control of nuclear material and special equipment" (OG 15/08);
- "Ordinance on conditions, deadlines and methods for acquiring the required professional training and renewal of knowledge on the application of measures for protection against ionising radiation" (OG 30/08);
- "Ordinance on measures of radiological and physical security of sources of ionizing radiation" (OG 39/08), "Ordinance on security"; and
- "National plan and programme of measures for protection against ionising radiation and interventions in case of emergency" (OG 49/08).

Also, in 2008 Croatian Parliament ratified revised "Small Quantity Protocol" as a part of the "Agreement between the Republic of Croatia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-proliferation of Nuclear Weapons" (OG, International Agreements, 3/08).

And finally, very important for further development of the joint Slovenian/Croatian NPPK Program was the establishment of the Croatian decommissioning fund at the end of 2007: "Act on the Fund for financing the decommissioning of the Krško nuclear power plant and the disposal of NPPK radioactive waste and spent nuclear fuel "(OG 107/07) regulates its activities, structure and management and the sources, purpose and management of the Fund's assets. In February 2008 the Fund was registered at Commercial Court and in April 2008 Statute of Fund was adopted. After that the interim manager and Administrative committee were nominated, and the Fund became operational.

Other elements of the legislative and regulatory framework

In addition to the basic and/or new framework outlined above, a number of other legal acts have some bearing on the national practices in radioactive waste and spent fuel management.

- Some other acts affect implementation of these laws and their regulations.
- The ratified international conventions and treaties, as well as the bilateral agreements, should also be considered as constituents of the national framework in a broader sense.

These items are presented in the Annex I on the regulatory framework. Although they address some general aspects of radiological protection or nuclear safety, or their specific implementations, they are generally not discussed in this report.

Regulatory body

Generally, based on the provision of the "Nuclear Safety Act" and the "Radiation Protection Act", the SONS is the regulatory body for nuclear safety, whereas the SORP is the regulatory body for radiation protection. The Regulation on radioactive waste further specifies SORP as the body empowered to grant authorizations for practices involving radioactive waste or spent sealed radioactive sources, whereas SONS grants authorizations for nuclear activities and facilities according to specifications of the two ordinances described above.

As mentioned earlier, the Ministry of Health, with its Sanitary Inspectorate, has retained

the authority for supervision and enforcement in radiation protection matters. This is partially compensated by the Article 44 of the "Radiation Protection Act", which obliges legal and natural persons, state administration bodies as well as bodies of local and regional self-government units to, at the request of the director of the SORP deliver, within 15 days, accurate and complete data, notices and documents, including also manufacturer's documents, needed by the SORP for performing administrative and other tasks in the field of protection against ionising radiation. Also, sanitary inspectors are, by the Article 47, obliged to, within eight days from the date of completion of inspectional supervision, forward to the SORP the minutes on inspectional supervision carried out and within the same period notify the SORP of the measures and actions undertaken.

About the Article 19 specific requirements

The Croatian regulatory framework adequately meets requirements which should be addressed in this section of the report.

General radiation protection provisions and nuclear safety requirements, as well as allocation of responsibilities, have been outlined within the above brief account of the "Radiation Protection Act" and the "Nuclear Safety Act". More detailed requirements are supplemented by the subordinated new regulations listed in this section.

Provisions on licensing, control, reporting and enforcement of safety for the spent fuel and radioactive waste management facilities are also generally introduced by those two basic acts. More specific requirement are subsequently provided by subordinated regulations, in particular by "Regulation on radioactive waste" and ordinances on nuclear activities and facilities described above.

Section F. Other General Safety Provisions

Safety provisions of the Joint Convention articles 21-26 are generally delineated in the "Radiation Protection Act" and the "Nuclear Safety Act", and further specified by the regulations cited above. Article 3 of the "Radiation Protection Act" defines sources of ionizing radiation to include, among other, radioactive materials and waste, as well as nuclear facilities and all materials from the nuclear fuel cycle which are not exempt from the regulatory control. As a consequence, all obligations stipulated by the Act and the ordinances regulating practices involving radioactive sources apply to the radioactive waste management as well.

By the "Radiation Protection Act", the person or legal entity which was granted the authorization for the practice involving radioactive sources "*shall be responsible for the implementation of protection measures against ionizing radiation and safety measures for the ionizing radiation source and shall bear the costs of their implementation*" (arti-

cle 32). By the Article 33, the holder of the authorization whose operations result in radioactive contamination of the environment, premises, areas, objects or persons by radioactive substances or incurs damages owing to loss of control over the source or for some other reason, shall be liable for the damages incurred and shall without delay ensure the removal of radioactive contamination and disposal of the radioactive source. Inspection, enforcement and penalties are provided for in later articles.

The regulations specify more details. In particular, the "Regulation on radioactive waste" in its subsection "4.1 Responsibility" (articles 16-19) specifies that the holder of the authorization shall bear full responsibility for radioactive waste and spent radioactive sources produced as a result of its activities, including removal, transport and placing in the central storage facility.

As described in the previous section, the "Nuclear Safety Act" sets appropriate nuclear safety requirements on the license holder.

Both basic laws specify that human and financial resources for safe waste management are among the general responsibilities of the license holder

The "Radiation Protection Act" and its "Ordinance on exposure limits" provide for radiation protection in all practices involving sources of ionizing radiation. Although they do not separately address spent fuel and radioactive waste management, they closely follow the BSS recommendations on radiation protection, both in general approach and in specific limits.

Additionally, the Regulation on radioactive waste, in its subsection 1.3.2 "Protection against ionizing radiation" (articles 10, 11) briefly lists particular obligations. Further specific requirements are provided by the "Ordinance on security", which gives source categorization and stipulates appropriate security measures, and by the "Ordinance on protection measures".

Management facilities for spent fuel and radioactive waste from nuclear fuel cycle are also subject to the "Nuclear Safety Act" and the subordinated regulations mentioned above. For their operation license, or earlier in their development, detailed design conditions and extensive safety analyses and reports are required to demonstrate that they will meet all operational radiation protection provisions.

Quality assurance program is requested in several sections of the "Ordinance on facility development", as appropriate for successive development stages. It is also addressed in the subsection 1.3.1 "Safety" of the Regulation on radioactive waste. A quality assurance program and a plan of measures for prevention and elimination of potential consequences of an emergency are obligatory prerequisites for authorization.

In addition to general requirements on emergency preparedness for nuclear facilities in the country, the "Nuclear Safety Act" has introduced Technical Support Centre for the case of nuclear accident, and a Manual which includes all the necessary specific elements of preparedness in the event of a nuclear accident (especially at the Krško NPP) has been developed.

Appropriate decommissioning arrangements before operational license for radioactive waste and nuclear facilities (where applicable) are required by both basic laws and their regulations.

Section G. Safety of Spent Fuel Management

Croatian legislative and regulatory framework contains basic provisions for the safety of spent fuel management, although no spent fuel has yet been managed in the Republic of Croatia, and no facilities for its management have been planned.

Some provisions, especially regarding general safety requirements, are addressed by the Radiation protection act and its subordinated regulations, both in sections which refer to any sources and in those dedicated to radioactive waste generation and management. But most provisions for spent fuel management are included either among general requirements of the "Nuclear Safety Act", or within more specific subordinated regulations, in particular in the "Ordinance on nuclear facilities" (although spent fuel is not always explicitly singled out).

For example, this Ordinance contains 15 groups of "general conditions" for design of nuclear facilities. Most of them are directly applicable both to spent fuel and to RW from nuclear fuel cycle (such as condition 4 from the first group: "*The design must meet conditions of the relevant quality assurance program, which was approved by the State Office for Nuclear Safety*"), whereas others require reasonable interpretation (e.g. condition 26 from the same group: "*The project must include a preliminary safety analysis report made in accordance with the standards of the International Atomic Energy Agency or the standards of the country of the supplier of the nuclear facility*"). The same chapter on design contains also "Particular conditions for designing waste disposal facilities", some of which refer to spent fuel as well, for instance "*The design of a waste disposal facility (repository) shall provide that: (a) radioactive waste or spent nuclear fuel is adequately isolated, taking into account its features, characteristics of location and other safety aspects in connection with the operation of the waste disposal facility (repository) and the termination of operation of the waste disposal facility (repository)...*".

Section H. Safety of Radioactive Waste Management

The elements of legal framework cited in the previous section on spent fuel similarly apply to the management of RW from nuclear fuel cycle. For example, "general conditions" from the "Ordinance on nuclear facilities" are explicitly intended for low and intermediate waste store or repository as well (if RW originates from nuclear fuel cycle), although some of them (in particular the operational safety and defence in depth in case of accident) may appear too prescriptive for LILW facilities. In addition, the Ordinance also contains several sections dedicated specifically to this RW.

However, no waste from nuclear fuel cycle has yet been managed in the Republic of

Croatia, and no facilities for its management have been planned. Only RW from other application is stored within the country, and safety of its management in the existing facilities has been considerably improved in recent years (waste characterization, conditioning, packaging etc.), as described in the previous report and elsewhere in this report.

But the provisions of the "Nuclear Safety Act" and detailed specifications of its subordinate regulations do not apply to this RW. Instead, the management of the waste actually generated in the Republic of Croatia is regulated only by the Radiation protection act and its subordinated regulations.

As described in the Section E and noted above, the provisions of this radiation protection regulatory line adequately address general safety requirements of RW management, closely reflecting IAEA recommendations. The Regulation on radioactive waste gives more detailed technical provisions on RW management, and explicitly refers to "*spent sealed radioactive sources and ionizing radiation sources which are not intended for further use*" as the waste types presently managed in the Republic of Croatia.

In addition, the Regulation outlines specific provisions for RW management facilities, but not nearly in such detail as the nuclear safety regulations provide for RW from nuclear fuel cycle. These differences are largely irrelevant for disposal facilities, as it is not reasonable to expect that any repository would be planned for the present small RW quantities alone, i.e. without fuel cycle waste.

The Ordinance on design and construction gives further requirements also applicable to the planned new central national RW storage, for which the Government has undertaken the responsibility to designate the appropriate site.

Section I. Transboundary Movement

The "Radiation Protection Act" explicitly bans any import of radioactive waste or spent fuel in the Republic of Croatia. Apart from full commitment to binding international instruments no other particular issues of transboundary movement needed to be specifically addressed in the Croatian regulations.

Sub-regional cooperation in the field of cross-border control

In 2007 SORP initiated sub-regional cooperation among ex-Yugoslavia countries regarding cross-border control of nuclear and other radioactive materials. This sub-regional cooperation involves Bosnia and Herzegovina, Montenegro, the Republic of Croatia, FYR Macedonia, Slovenia and Serbia. Two meetings were held up to now: founding meeting in Zagreb and the second meeting in Belgrade, Serbia. Third meeting is scheduled to take place in Skopje, FYR Macedonia. Protocols for the exchange of information were established. In time mutual border-crossing points will be supplied with appropriate equipment needed for control of transboundary movement of radioactive material depending on resources. Database will be developed for information exchange among the participating countries enabling survey of suspicious transports and control

over possible illicit trafficking in or through the region.

Section J. Disused Sealed Sources

General provisions

Safety of disused sealed sources is ensured by the "Regulation on radioactive waste" which addresses spent radioactive sources and with several ordinances mentioned above.

According to the "Ordinance on protection measures", the authorization for usage of any source will be granted only if all protection measures against ionizing radiation are ensured.

Since there is no producer and exporter of sealed sources in the Republic of Croatia there are no regulatory provisions for import of disused sealed sources returned to the manufacturer.

Management of spent sources and control over orphan sources

In last several years significant steps have been undertaken to increase safety of the spent sources at the IRB store, including completion and update of the waste inventory.

State Office for Radiation Protection was and still is engaged in three international projects aimed at improvements of management of spent sources and control over orphan sources:

- **IAEA/CRO/9/009:** Management and Safe Storage of Spent or Disused Sealed Sources

  Project objectives are:

  – site selection and designation of the site for the future national sealed sources storage facility which could eventually accept other types of radioactive waste generated in the Republic of Croatia outside of nuclear fuel cycle that is already stored or will be generated in the future;
  – by the end of November 2008 following should be achieved: analysis of the annual waste generation in the country by the existing waste streams, selection of appropriate radioactive waste management technology for each of the

streams, proposal for necessary infrastructure needed for the national storage facility with staff qualification, as well as report on the present contamination around radioactive waste storage facility at Institute Ruđer Bošković;

– donation of equipment for on site remote handling and removal of ionising radiation sources, and safe transport to the storage facility.

- ***IAEA-RER-9.073:*** Implementation of National Strategies for Regaining Control over "Orphan Sources"

  Project results are:

– national strategy for regaining control over orphan sources was developed and implemented;
– ionising radiation detection equipment was donated for outfitting search and recovery teams;
– 19 persons were trained in orphan sources search and recovery techniques;
– List of orphan sources and relevant locations has been compiled and verified;
– 27 ionising radiation sources were recovered from abandoned industrial sites or nearby locations.

- ***U.S.A. Ministry of Defense and FBI****: International Counter Proliferation Program.*

  Project results are:

– 23 persons were trained as secondary response teams[3] in detection and response to trafficking of nuclear and other radioactive materials in cross border transport;
– equipment for detection of nuclear and other radioactive materials was donated.

Spent radium sources management

All spent radium sources in the Republic of Croatia from medical applications had been collected, conditioned and properly stored.

[3] Secondary response teams are a part of the emergency response tams within the scope of the National Plan and Program in the case of radiological emergency.

Several years ago a thorough search followed by characterization and conditioning of all radium sources in the Republic of Croatia was undertaken. Data on the sources provided by regulatory body found in radiological histories, in hospitals records etc., were investigated and altogether 298 sources were found and collected, with approximately 1400 mg of ^{226}Ra.

The sources were of different forms (needles, tubes, plates) and all came from medical applications. They were collected in Zagreb and conditioned in the Institute Ruđer Bošković[4]. The sources were first packed into stainless steel containers (approximately 50 mg of radium in each of the containers), which were then welded and bubble tested. Stainless steel containers (in bundles of 10) were placed into three lead containers. The lead containers were packed into standard 200 l drums filled with concrete: two containers in one drum, and the third container in another drum. Drums were properly marked.

Characterization and conditioning of the sources were done by the IAEA approved procedure and supervised by the Agency. Presently, the drums are at the IRB store (TSRM). Their long term future is still not decided.

Additional information on the conditioning campaign was provided in the Annex II of the previous report.

Cases of orphan source recovery

In last several years a few orphan sources were recovered.

Orphan source (radioactive lightning rod with 3.7 GBq of ^{152,154}Eu) recovery was made in November 2004, in a truck transporting scrap metal across the Croatian/Slovenian border. (On average, SORP is involved in 10-12 interventions annually related to incidents with undeclared sources in cross-border transport. Lightning roads are found as orphan sources during border controls 1-2 times a year.)

Among impressive cases was recovery of 17 caesium sources (level gauges, total activity 71.24 GBq of ^{137}Cs) in 2002, which had been used in a containers as weights on hay stacks, in a small village near Obrovac.

Other forms of contaminated materials are frequently found in transports of scrap metals. In 2007 ^{226}Ra dial was detected in scrap metal in transit through the Republic of Croatia from Hungary to the melting factory in Bosnia and Herzegovina. During 2008 transport of metal tubes produced in the Republic of Croatia contaminated with ^{60}Co was detected on border. Raw material was imported from Italy where it was originally imported from China. Interpol was involved. Location of approx. 100 t of contaminated material (out of which 1 t ended up in the Republic of Croatia) was determined.

[4] In addition to 298 spent sources, one sample of radium contaminated soil was included (5th row in the Table 4 of the Annex II of this Report), which lead to the number of 299 sources mentioned in the Annex II of the previous report.

Section K. Planned Activities to Improve Safety

Planned activities

As already indicated in this Report, the most important planned (or ongoing) activity is:

- the site for the central national RW storage facility should soon be designated.

Note on the last Review Meeting issues

The Republic of Croatia was actively participating at the Review Meeting of Contracting Parties to the Joint Convention in 2006.

Questions to the Republic of Croatia were most frequently concerned with the establishment of the national decommissioning fund for NPP Krško, and the long-term policies particularly regarding the NPP Krško SF and RW joint management. These issues were given appropriate attention in the current Report.

Section L. Annexes

Annex I Regulatory Framework

In addition to the laws and regulations listed in the Section E, a number of other legal acts have some bearing on the national practices in radioactive waste and spent fuel management.

Other acts

Several other laws are either related to nuclear safety or to the implementation of the three basic laws from the Section E:

- The Act on Third Party Liability for Nuclear Damage (from 1998)
- The Act on Sanitary Inspection (from 1999)
- The Act on Protection from Natural Disasters (from 1997),
- The Act on Organization and Field of Activities of the Ministries and Other Governmental Bodies (from 1999 and 2000),

- The Act on General Administrative Procedures (from 1991),
- The Act on Criminal Procedure (from 1997, 1998 and 2000),
- The Act on Transport of Hazardous Material (from 1993),
- The Act on Internal Affairs (from 1991, 1992, 1994, 1998 and 2000).

Conventions, treaties and bilateral agreements

Furthermore, based on the Croatian Constitution, all announced and ratified international treaties also constitute an integral part of Croatian legislation and can be applied directly. So the following international legal instruments, to which The Republic of Croatia is a party, should be mentioned as a part of Croatian legislative framework in this field:

- Statute of the International Atomic Energy Agency,
- Agreement on the Privileges and Immunities of the International Atomic Energy Agency,
- Vienna Convention on Civil Liability for Nuclear Damage,
- Convention on the Physical Protection of Nuclear Material,
- Convention on Early Notification of a Nuclear Accident,
- Convention on Assistance in the Case of a Nuclear Accident of Radiological Emergency,
- Convention on Nuclear Safety,
- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention,
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Finally, the bilateral agreements in this field also constitute a part of the national legislative and regulatory framework:

- Agreement Between the Republic of Croatia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-proliferation of Nuclear Weapons;
- The Protocol Additional to the Agreement Between the Republic of Croatia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-proliferation of Nuclear Weapons;
- Agreement Between the Republic of Croatia and the Republic of Slovenia on

the Early Exchange of Information in the Event of a Radiological Emergency;

- Agreement Between the Government of the Republic of Croatia and the Government of the Republic of Hungary on the Early Exchange of Information in the Event of a Radiological Emergency.
- 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)

Annex II Radioactive Waste Inventory

As explained in the Report, the only Croatian operational RW storage facility is the IRB temporary store of radioactive material (TSRM).
This Annex contains TSRM radionuclide inventory lists as reported to the SORP. In order to save space, it is reproduced here without columns containing information such as ordinal number or registration number of sources. In addition, the list of sources stored in now closed storage at IMI is presented.

The TSRM radionuclide inventory

Table I. *^{60}Co sources (from level gauges)*

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{60}Co	3 sources $A_{init.}$ 254.9 MBq, $A_{31.12.2004}$ 57.5 MBq $A_{init.}$ 254.9 MBq, $A_{31.12.2004}$ 57.5 MBq $A_{init.}$ 68 MBq, $A_{31.12.2004}$ 15.2 MBq		
^{60}Co	6 sources $A_{init.}$ 4 x 92.4 MBq, $A_{31.12.2004}$ 4 x 22.3 MBq $A_{init.}$ 2 x about 111 MBq, $A_{31.12.2004}$ 2 x 26.8 MBq		
^{60}Co	3 sources $A_{init.}$ 2 x 4.6 GBq, $A_{31.12.2004}$ 2 x 1.24 GBq $A_{init.}$ 1GBq, $A_{31.12.2004}$ 0.27 GBq		
^{60}Co	3 sources $A_{init.}$ 3 x 180MBq, $A_{31.12.2004}$3 x 52.8 MBq	sources in working containers	

RADIO-NUCLIDE	**ACTIVITY (A)**	**FORM**	**DATE STORED**
^{60}Co	18 sources 1. $A_{init.}$ 14 x 100 MBq, $A_{31.12.2004}$ 14 x 44.8 MBq 2. $A_{init.}$ 4 x 1.1 GBq, $A_{31.12.2004}$ 4 x 492.3 MBq	sources from level gauges	
^{60}Co	2 sources 1. $A_{init.}$ 8.29 GBq, $A_{31.12.2004}$ 3.976 GBq 2. $A_{init.}$ 6.02 GBq, $A_{31.12.2004}$ 2.887 GBq		
^{60}Co	3 sources 1. $A_{init.}$ 365 MBq, $A_{31.12.2004}$ 177.15 MBq 2. $A_{init.}$ 216 MBq, $A_{31.12.2004}$ 105.0 MBq 3. $A_{init.}$ 95 MBq, $A_{31.12.2004}$ 38.5 MBq		
^{60}Co	$A_{init.}$ about 20 kBq, $A_{31.12.2004}$ 11.5 kBq	a piece of filter paper	
^{60}Co	2 sources $A_{init.}$ about 222 MBq, $A_{31.12.2004}$ 127.3 MBq $A_{init.}$ about 3.15 GBq, $A_{31.12.2004}$ 1.815 GBq	sources in protective containers	
^{60}Co	$A_{init.}$ 380 MBq, $A_{31.12.2004}$ 254.25 MBq	in a locked container	
^{60}Co	$A_{INIT.}$ 7.77 GBq, $A_{31.12.2004}$ 5.094 GBq	a source in a lead container – defectoscope	
^{60}Co	unknown activity	in a protective container	
^{60}Co	unknown activity	in a lead container	
^{60}Co	unknown activity B.D. is 5 μSv/h	looks like a differential of a big vehicle	
^{60}Co	$A_{init.}$ 165.5 MBq, $A_{31.12.2004}$ 140.37 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 165.5 MBq, $A_{31.12.2004}$ 140.37 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 168.1 MBq, $A_{31.12.2004}$ 142.56 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 165.5 MBq, $A_{31.12.2004}$ 140.37 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 162.9 MBq, $A_{31.12.2004}$ 138.18 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 162.9 MBq, $A_{31.12.2004}$ 138.18 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 162.9 MBq, $A_{31.12.2004}$ 138.18 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 165.5 MBq, $A_{31.12.2004}$ 140.37 MBq	a sealed source	
^{60}Co	$A_{INIT.}$ 162.9 MBq, $A_{31.12.2004}$ 138.18 MBq	a sealed source	
^{60}Co	3 sources individual activities unknown; $A_{31.12.2004}$ 239.35 MBq	sealed sources in a common container	
^{60}Co	$A_{init.}$ 5.759 GBq (13.09.1991) $A_{31.12.2004}$ 1.002GBq	a sealed source, no.: 1934-7-91/3	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{60}Co	$A_{init.}$ 5.768 GBq (03.09.1997) $A_{31.12.2004}$ 2.205 GBq	a sealed source, no.: 1289-7-97/3	
^{60}Co	$A_{31.12.2004}$ 157.9 MBq	a sealed source (a spent level gauge in own protective container)	
^{60}Co	$A_{init.}$ 1.9 GBq 1996. $A_{31.12.2004}$ 650.7 MBq	a sealed source (spent radioactive source), no.: Z-0150/0230	
^{60}Co	$A_{15.07.2005}$ 8.14 G Bq, $A_{31.12.2005}$ 7.659 GBq	sealed source (separator bs-101 – position LSH), source no.W 141	11.07.2005
^{60}Co	$A_{15.07.2005}$ 3.68 GBq, $A_{31.12.2005}$ 3.462 GBq	sealed source (separator bs-101 – position LSH), source no.533	11.07.2005
^{60}Co	$A_{15.08.2005}$ 462.48 MBq, $A_{31.12.2005}$ 440.04 MBq	sealed source (lime-stone repository), source no.546	11.08.2005
^{60}Co	$A_{15.08.2005}$ 353.53 MBq, $A_{31.12.2005}$ 336.37 MBq	sealed source (coke repository), source no.W 149	11.08.2005
^{60}Co	$A_{15.08.2005}$ 192.82 MBq, $A_{31.12.2005}$ 183.46 MBq	sealed source (lime-kiln), source no.YVNCO 183	11.08.2005
^{60}Co	$A_{15.08.2005}$ 71.46 MBq, $A_{31.12.2005}$ 67.99 MBq	sealed source (lime repository)	11.08.2005
^{60}Co	$A_{30.07.1998.}$ 203.140 MBq, $A_{31.12.2005}$ 78.4 MBq	sealed source, source no.037	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 208.780 MBq, $A_{31.12.2005}$ 78.5 MBq	sealed source, source no.038	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 112.860 MBq, $A_{31.12.2005}$ 42.4 MBq	sealed source, source no.030	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 118.500 MBq, $A_{31.12.2005}$ 44.6 MBq	sealed source	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 112.860 MBq, $A_{31.12.2005}$ 42.4 MBq	sealed source, source no.035	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 112.860 MBq, $A_{31.12.2005}$ 42.4 MBq	sealed source, source no.033	22.12.2005

RADIO-NUCLIDE	**ACTIVITY (A)**	**FORM**	**DATE STORED**
^{60}Co	$A_{30.07.1998.}$ 3.130 GBq, $A_{31.12.2005}$ 1.18 GBq	sealed source, source no.044	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 3.120 GBq, $A_{31.12.2005}$ 1.17 GBq	sealed source, source no.043	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 3.180 GBq, $A_{31.12.2005}$ 1.20 GBq	sealed source, source no.042	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 3.710 GBq, $A_{31.12.2005}$ 1.39 GBq	sealed source, source no.047	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 3.700 GBq, $A_{31.12.2005}$ 1.39 GBq	sealed source, source no.045	22.12.2005
^{60}Co	$A_{30.07.1998.}$ 3.690GBq, $A_{31.12.2005}$ 1.39 GBq	sealed source, source no.046	22.12.2005
^{60}Co	A $_{09.2006}$ 37 kBq, $A_{31.12.2006}$ 36.9 kBq	2 sealed sources (part of device model AMN 100, no. 4150, ^{241}Am + ^{60}Co)	07.03.2006
^{60}Co	A $_{09.2006}$ 6.6 MBq, $A_{31.12.2006}$ 6.59 MBq	a sealed source YUK Co60-3	29.09.2006
^{60}Co + depleted uranium	$A_{01.08.1999.}$ 233.67 TBq, $A_{1..12.2006}$ 66.63 TBq	sealed source, serial no. 4103	05.12.2006
^{60}Co	$A_{05.10.2005}$ 142 MBq, $A_{31.12.2007}$ 55 MBq	protective com-tainer ser. no. 696/-04-99 (BERTHOLD	12.02.2007
^{57}Co	$A_{10.03.2003.}$ 1.85 GBq $A_{31.12.2007.}$ 21.26 MBq	model: KT1-5	20.03.2007
^{60}Co	$A_{3..02.2007}$ 25 MBq B.D. na 50 cm 35μSv/h	calibration source with holder No. HO 2605	23.02.2007
^{60}Co	$A_{31.12.2001.}$ 38 TBq $A_{31.12.2007}$ 17.33 TBq	in a protective container, type COT- 20#3507, lead (more than 1000 kg)	20.03.2007
^{60}Co	2 sources $A_{19.03.2007}$ 37 MBq each, B.D. at 50 cm 50μSv/h; $A_{31.12.2007}$ 33.37 TBq each	in protective containers	19.03.2007

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{60}Co + depleted uranium	$A_{07.07.1986..}$ 1.1 TBq, $A_{31.12.2007}$ 65.66 GBq	Defectoscope GAMMAMAT, model-type D/2015B(U), ser. no. 438 (depleted uranium - 130 kg with the source ^{60}Co), source ser. no. 1100196	02.04.2007
^{60}Co	$A_{15.05.1996.}$ 37MBq, $A_{31.12.2007}$ 8.63 MBq	source ser. no. Z-JK/ZB 6	05.09.2007
^{60}Co	$A_{15.05.1996.}$ 37MBq, $A_{31.12.2007}$ 8.63 MBq	source ser. no. Z-JK/ZB 5	05.09.2007

Table II. *Radioactive lightning rods with ^{60}Co and $^{152/154}$Eu*

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{60}Co	$A_{INIT.}$ 0,12 GBq, $A_{31.12.2004}$ 78.9 MBq	a lighting rod	
^{60}Co	$A_{INIT.}$ 7.4 GBq, $A_{31.12.2004}$ 1.64 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 7,9 GBq, $A_{31.12.2004}$ 4.03 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 6,62 GBq, $A_{31.12.2004}$ 4.31 GBq	a lighting rod	
$^{152/154}$Eu	unknown activity	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 6.1 GBq each source (2 sources) $A_{31.12.2004}$ 2 x 4.04 GBq	lighting rods	
$^{152/154}$Eu	1 source - unknown init. activity	a lighting rod	
$^{152/154}$Eu	1 source - unknown init. activity	a lighting rod	
$^{152/154}$Eu	1 source - unknown init. activity	a lighting rod	
$^{152/154}$Eu	2 sources $A_{INIT.}$ 6.05 GBq, $A_{31.12.2004}$ 5.16 GBq $A_{INIT.}$ 6.07 GBq, $A_{31.12.2004}$ 5.18 GBq	lighting rods	
^{60}Co	$A_{INIT.}$ 142 MBq, $A_{31.12.2004}$ 110.5 MBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 2.71 GBq, $A_{31.12.2004}$ 2.32 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 8.0 GBq, $A_{31.12.2004}$ 6.92 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 2.55 GBq, $A_{31.12.2004}$ 2.23 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 4.2 GBq, $A_{31.12.2004}$ 3.75 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 5.1 GBq, $A_{31.12.2004}$ 4.55 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 9.7 GBq, $A_{31.12.2004}$ 8.73 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 3.1 GBq, $A_{31.12.2004}$ 2.80 GBq	a lighting rod	
^{60}Co	$A_{INIT.}$ 0.8 GBq, $A_{31.12.2004}$ 0.69 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 5.0 GBq, $A_{31.12.2004}$ 4.53 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 7.0 GBq, $A_{31.12.2004}$ 6.33 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 11.1 GBq, $A_{31.12.2004}$ 10.10 GBq	a lighting rod	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$^{152/154}$Eu	$A_{INIT.}$ 8.5 GBq, $A_{31.12.2004}$ 7.81 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 5.9 GBq, $A_{31.12.2004}$ 5.42 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 8.5 GBq, $A_{31.12.2004}$ 7.81 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 8 GBq, $A_{31.12.2004}$ 7.38 GBq	a lighting rod	
$^{152/154}$Eu	$A_{INIT.}$ 2.8 GBq, $A_{31.12.2004}$ 2.62 GBq	a lighting rod IJS-2243	
$^{152/154}$Eu	$A_{INIT.}$ 2.6 GBq, $A_{31.12.2004}$ 2.44 GBq	a lighting rod IJS-2253	
$^{152/154}$Eu	$A_{INIT.}$ 7.4 GBq, $A_{31.12.2004}$ 6.91 GBq	a lighting rod Y-0024	
$^{152/154}$Eu	$A_{INIT.}$ 7.4 GBq, $A_{31.12.2004}$ 6.91 GBq	a lighting rod E-0023	
$^{152/154}$Eu	1. $A_{INIT.}$ 5 GBq, $A_{31.12.2004}$ 4.75 GBq 2. $A_{INIT.}$ 8 GBq, $A_{31.12.2004}$ 7.60 GBq	lighting rods, no. 2070 and 190	
$^{152/154}$Eu	1. $A_{INIT.}$ 5 GBq, $A_{31.12.2004}$ 4.77 GBq 2. $A_{INIT.}$ 5 GBq, $A_{31.12.2004}$ 4.77 GBq	lighting rods, two rings, one on the another, no. 2203 and 2	
$^{152/154}$Eu	1. $A_{INIT.}$ 6 GBq, $A_{31.12.2004}$ 5.74 GBq 2. $A_{INIT.}$ 6 GBq, $A_{31.12.2004}$ 5.74 GBq	lighting rods, two rings, one on the another, no. 2379 and 11	
$^{152/154}$Eu	$A_{INIT.}$ 14.8 GBq (1991), $A_{31.12.2004}$ 6.27GBq	a lighting rod, ring, no. 2145	
$^{152/154}$Eu	$A_{init.}$ 14.8 GBq (1991), $A_{31.12.2004}$ 6.27GBq	a lighting rod, ring	
$^{152/154}$Eu	$A_{INIT.}$ 14.8 GBq (1991), $A_{31.12.2004}$ 6.27GBq	a lighting rod, no. 2322, cylin-der, bigger	
$^{152/154}$Eu	$A_{INIT.}$ 14.8 GBq (1991), $A_{31.12.2004}$ 6.27GBq	a lighting rod, no. 2322, cylin-der, bigger	
$^{152/154}$Eu	Estimated 6 GBq (June 2004), $A_{31.12.2004}$ 5.73 GBq	a lighting rod, serial no. 1466	
$^{152/154}$Eu	Estimated activity 6 GBq (June 2004), $A_{31.12.2004}$ 5.73 GBq	a lighting rod, serial no. 314 R	
$^{152/154}$Eu	Estimated activity 6 GBq (June 2004), $A_{31.12.2004}$ 5.73 GBq	a lighting rod, serial no. 313 R	
$^{152/154}$Eu	Estimated activity 6 GBq (July 2004) $A_{31.12.2004}$ 5.83 GBq	a lighting rod, serial no. 2214	
$^{152/154}$Eu	Estimated activity 6 GBq (July 2004)	a lighting rod, serial no. 2252	
$^{152/154}$Eu	Estimated activity 6 GBq each source (July 2004) $A_{31.12.2004}$ 5.83 GBq	lighting rods, no. 2380 and 2393	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{60}Co	Estimated activity 1.11 GBq (July 2004.) A $_{31.12.2004}$ 1.08 GBq	a lighting rod, loop, no. 2026	
$^{152/154}$Eu	Estimated activity 6 GBq each source (Nov. 2004) A $_{31.12.2004}$ 5.93 GBq	lighting rods, no. 1208 and 1265	
$^{152/154}$Eu	Estimated activity 8 GBq (Nov. 2004) A $_{31.12.2004}$ 7.93 GBq	a lighting rod, no. 2273	
$^{152/154}$Eu	1. Estimated activity 8 GBq, A $_{31.12.2004}$ 7.94 GBq 2. Estimated activity 6 GBq each of two sources (Nov. 2004), A $_{31.12.2004}$ 5.96 GBq	a lighting rod, no. 2295, cylinder, smaller lighting rods, no. 2294 (smaller cylinder) and 2358. (bigger cylinder)	
$^{152/154}$Eu	Estimated activity A $_{31.12.2004}$ 5-6 GBq	a lighting rod, YVG 2346 (cylinder, smaller)	
$^{152/154}$Eu	Estimated activity (01/2005) 6 GBq	lighting rod (cylinder), ser.no. Z-478	12.01.2005
$^{152/154}$Eu	Estimated activity (01/2005) 6 GBq $A_{31.12.2005}$ 5.65 GBq	lighting rod (disc), ser.no. Z-479	12.01.2005
$^{152/154}$Eu	2 sources 1.Estimated activity (02/2005) 6 GBq $A_{31.12.2005}$ 5.67 GBq 2. Estimated activity (02/2005) 6 GBq $A_{31.12.2005}$ 5.67 GBq	2 lighting rods (cylinders) 1. no. 1122 2. no. 2005	10.02.2005
$^{152/154}$Eu	2 sources 1.Estimated activity 6 GBq (02/2005) $A_{31.12.2005}$ 5.67 GBq 2. Estimated activity po 6 GBq (02/2005) $A_{31.12.2005}$ 5.67 GBq	2 lighting rods (cylinders) 1. no. 1382 2. no. 1885	11.02.2005
$^{152/154}$Eu	Estimated activity 6 GBq (02/2005) $A_{31.12.2005}$ 5.68 GBq	lighting rod, ser. no. 1563	18.02.2005
$^{152/154}$Eu	Estimated activity 6 GBq (02/2005) $A_{31.12.2005}$ 5.69 GBq	lighting rod, ser. no. 2188, disc	25.02.2005
$^{152/154}$Eu	Estimated activity 6 GBq (02/2005) $A_{31.12.2005}$ 5.69 GBq	lighting rod, ser. no. 2242, disc	25.02.2005
$^{152/154}$Eu	Estimated activity 6 GBq (02/2005) $A_{31.12.2005}$ 5.69 GBq	lighting rod, ser. no. 2172, disc	25.02.2005
$^{152/154}$Eu	Estimated activity 6 GBq (02/2005) $A_{31.12.2005}$ 5.69 GBq	lighting rod, ser. no. 2212, small cylinder	25.02.2005

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$^{152/154}$Eu	Estimated activity 4 GBq (04/ 2005) $A_{31.12.2005}$ 3.83 GBq	lighting rod, ser. no. 2282 cylinder	28.04.2005
$^{152/154}$Eu	2 sources Estimated activity 4 GBq per cylinder (04/ 2005) $A_{31.12.2005}$ 3.83 GBq	lighting rod (cylinders) 1. Ser. no. 2282 2. Ser. no. 2356	28.04.2005
$^{152/154}$Eu	3 sources Estimated activity 4 GBq per source (05/2005) $A_{31.12.2005}$ 3.84 GBq per source	3 lighting rods (discs) 1. ser. no. 2250 2. ser. no. 2254 3. ser. no. 2255	02.05.2005
^{60}Co	Estimated activity 925 MBq (05/2005) $A_{31.12.2005}$ 852.94 MBq	lighting rod (disc)	20.05.2005
$^{152/154}$Eu	6 sources Estimated activity 4 GBq per source (06/2005) $A_{31.12.2005}$ 3.86 GBq per source	3 lighting rods, 2 sources (cylinders) in each 1. ser. nos. 2348, 2351 2. ser. nos. 2371, 1746 3. ser. nos. 2337, 1554-S	02.06.2005
$^{152/154}$Eu	Estimated activity 4 GBq (06/2005) $A_{31.12.2005}$ 3.86 GBq	lighting rod, ser. no. 2301, cylinder, small	07.06.2005
$^{152/154}$Eu	2 sources Estimated activity 4 GBq (06/2005) each $A_{31.12.2005}$ 3.86 GBq	lighting rod, cylinders, serial 2318, 2366	07.06.2005
$^{152/154}$Eu	Estimated activity 6 GBq (06/2005) $A_{31.12.2005}$ 5.80 GBq	lighting rod, ser. no.2226, disc	13.06.2005
$^{152/154}$Eu	Estimated activity 6 GBq (07/2005) $A_{31.12.2005}$ 5.81 GBq	lighting rod, ser. no.2577, cylinder	01.07.2005
$^{152/154}$Eu	Estimated activity 5 GBq (07/2005) $A_{31.12.2005}$ 4.92 GBq	lighting rod, ser. no.2331, cylinder	13.07.2005
$^{152/154}$Eu	Estimated activity 4 GBq (07/2005) $A_{31.12.2005}$ 3.88 GBq	lighting rod, ser. no. YVG-2006, big “screw”	15.07.2005
$^{152/154}$Eu	Estimated activity 4 GBq (07/2005) $A_{31.12.2005}$ 3.89 GBq	lighting rod, ser. no.1395, cylinder	18.07.2005

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$^{152/154}$Eu	24 sources Estimated total activity 105.4 GBq (08.09.2005) $A_{31.12.2005}$ 104.74 GBq	24 lighting rods serial nos. 2127, 2167, 206, 1745, 224, 186, 1087, 2743,1841, 1511, 205, 222, 2129,1086, bb, 220, 699, 672, 1400, 223, 2214, 642, 2166 i 2183; small cylinders	01.09.2005
$^{152/154}$Eu		lighting rod, small "screw" ser. no. 191	01.09.2005
$^{152/154}$Eu	9 sources Estimated total activity 32.8 GBq (08.09.2005) $A_{31.12.2005}$ 32.12 GBq	9 lighting rod, ser. nos. 2266, 2327, 2322, 2271, 2321, 2319, 2361, 2325, 2375; big cylinders	01.09.2005
$^{152/154}$Eu	Estimated activity 5 GBq (10/2005) $A_{31.12.2005}$ 4.90 GBq	lighting rod, ser. no.2306, cylinder, big	07.09.2005
$^{152/154}$Eu	Estimated activity 5 GBq (10/2005) $A_{31.12.2005}$ 4.90 GBq	lighting rod, ser. no.2364 cylinder, big	07.09.2005
$^{152/154}$Eu	Estimated activity 4 GBq (10/2005) $A_{31.12.2005}$ 3.95 GBq	lighting rod, ser. no.: 636, cylinder, smaller	19.10.2005
$^{152/154}$Eu	Estimated activity 4.3 GBq (10/2005) $A_{31.12.2005}$ 4.25 GBq	lighting rod, ser. no.: 2322, cylinder, bigger	27.10.2005
$^{152/154}$Eu	2 sources Estimated activity 1. 4 GBq (11/2005) $A_{31.12.2005}$ 3.96 GBq 2. 3.2 GBq (11/2005) $A_{31.12.2005}$ 3.17 GBq	lighting rod (cylinders) 1. ser. no. 2297 2. ser. no. 2248	09.11.2005
$^{152/154}$Eu	Estimated activity 3.2 GBq (11/2005) $A_{31.12.2005}$ 3.17 GBq	lighting rod, ser. no. YVG 425, screw	09.11.2005
$^{152/154}$Eu	Estimated activity 3.8 GBq (11/2005) $A_{31.12.2005}$ 3.78 GBq	lighting rod, ser. no. 2192, disc	28.11.2005
$^{152/154}$Eu	Estimated activity 4.0 GBq (11/2005) $A_{31.12.2005}$ 3.98 GBq	lighting rod, ser. no. 2292, disc	28.11.2005

RADIO-NUCLIDE	**ACTIVITY (A)**	**FORM**	**DATE STORED**
^{60}Co	Estimated activity 37 MBq (11/2005) $A_{31.12.2005}$ 36.6 MBq	lighting rod, ser. no. YVG 726 disc	28.11.2005
$^{152/154}$Eu	2 sources 1. Estimated activity 2.2 GBq (11/2005) $A_{31.12.2005}$ 2.19 GBq 2. estimated activity 1.9 GBq (11/2005) $A_{31.12.2005}$ 1.89 GBq	lighting rod, 2 discs 1. Ser. no. 2115 2. Ser. no.: 2165	28.11.2005
$^{152/154}$Eu	Estimated activity 2.9 GBq (12/2005) $A_{31.12.2005}$ 2.89 GBq	lighting rod, ser. no.: YVG 1004, screw	14.12.2005
$^{152/154}$Eu	Estimated activity 4.8 GBq (12/ 2005) $A_{31.12.2005}$ 4.79 GBq	lighting rod, ser. no. 2286 (disc)	16.12.2005
$^{152/154}$Eu	2 sources Estimated activity (12/ 2005) 1. source 4.8 GBq $A_{31.12.2005}$ 4.79 GBq 2. source 3.8 GBq $A_{31.12.2005}$ 3.79 GBq	lighting rod, 2 discs 1. Ser. no. 2239 2. Ser. no. 2240	16.12.2005
$^{152/154}$Eu	2 sources Estimated activity (12/ 2005) 1. disc 3.7 GBq $A_{31.12.2005}$ 3.69 GBq 2. disc 3.1 GBq $A_{31.12.2005}$ 3.09 GBq	lighting rod, 2 discs 1. Ser. no. 2229 2. Ser. no.: 2204	16.12.2005
$^{152/154}$Eu	Estimated activity 3.8 GBq (10.01.2006) $A_{31.12.2006}$ 3.57GBq	lighting rod, ser.no. 698 (small cylinder)	10.01.2006
$^{152/154}$Eu	2 sources 1.Estimated activity 3.8 GBq $A_{31.12.2006}$ 3.58GBq 2. Estimated activity 3.8 GBq, $A_{31.12.2006}$ 3.58GBq	2 lighting rods (discs) 1. ser.no. 2134 2. ser.no. 2161	20.01.2006
$^{152/154}$Eu	2 sources 1.Estimated activity 1.9 GBq, $A_{31.12.2006}$ 1.80 GBq 2. Estimated activity 1.9 GBq, $A_{31.12.2006}$ 1.80 GBq	2 lighting rods (discs) 1. ser.no. 2146 2. ser.no. 2175	23.02.2006
$^{152/154}$Eu	2 sources Estimated activity (03/ 2006) 1. disc 4.1 GBq, $A_{31.12.2006}$ 1.80 GBq 2. disc 4.4 GBq, $A_{31.12.2006}$ 4.17 GBq	lighting rod (2 discs) 1. Ser. no. 2186 2. Ser. no. 2227	23.02.2006
$^{152/154}$Eu	Estimated activity (03/ 2006) 4.1 GBq, $A_{31.12.2006}$ 1.80 GBq	lighting rod, ser. no. 2177, disc	23.02.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$^{152/154}$Eu	Estimated activity (04/ 2006) 1. 4.8 GBq, $A_{31.12.2006}$ 4.58 GBq 2. 3.8 GBq, $A_{31.12.2006}$ 3,62GBq	lighting rod (2 cylinders) 1. Ser. no.: 2787, small cylinder 2. Ser. no.: 2363, big cylinder	28.03.2006
$^{152/154}$Eu	3 sources 1&2. Estimated activity 3.8 GBq $A_{31.12.2006}$ 3,62GBq + 4.3 GBq, $A_{31.12.2006}$ 4.10GBq 3. Estimated activity 4.7 GBq, $A_{31.12.2006}$ 4.48 GBq	2 lighting rods 1&2. ser.nos. 2276, 2359 (big cylinders) 3. ser.no. 2028 (small cylinder)	28.03.2006
$^{152/154}$Eu	Estimated activity (04/ 2006) 4.6 GBq, $A_{31.12.2006}$ 4.39 GBq	lighting rod, ser. no.: 2435, small cylinder	30.03.2006
$^{152/154}$Eu	2 sources 1.Estimated activity 5.1 GBq, $A_{31.12.2006}$ 4.87 GBq 2. Estimated activity 5.1 GBq, $A_{31.12.2006}$ 4.87 GBq	2 lighting rods (small cylinders) 1. ser.no. 1904 2. ser.no. 1907	10.04.2006
$^{152/154}$Eu	6 sources 1&2. Estimated activity 2.8 GBq, $A_{31.12.2006}$ 2.67 GBq and 3.5 GBq, $A_{31.12.2006}$ 3.36 GBq 3&4. Estimated activity 5.0 GBq and 4.6 GBq (04/2006) 5&6. Estimated activity 2.8 GBq, $A_{31.12.2006}$ 2.67 GBq and 5.1 GBq, $A_{31.12.2006}$ 4.87 GBq	3 lighting rods (2 small cylinders each) 1&2. ser.nos. 596, 1206 3&4. ser.nos. 1282, 814 5&6. ser.nos. 189, 1286	10.04.2006
$^{152/154}$Eu	4 sources 1&2. Estimated activity 3.7 GBq and 2.8 GBq, $A_{31.12.2006}$ 2.67 GBq 3&4. Estimated activity 2.8 GBq, $A_{31.12.2006}$ 2.67 GBq and 3.8 GBq, $A_{31.12.2006}$ 3.63 GBq	2 lighting rods (2 small cylinders each) 1&2. ser.nos. 778,394 3&4. ser.nos. 606, 1207	10.04.2006
$^{152/154}$Eu	3 sources 1. Estimated activity: 2.8 GBq, $A_{31.12.2006}$ 2.73GBq 2. Estimated activity 3.8 GBq, $A_{31.12.2006}$ 3.66 GBq 3. Estimated activity. 2.9 GBq, $A_{31.12.2006}$ 2.79GBq	3 lighting rods (discs) 1. ser.no. 2390 2. ser.no. 2350 3. ser.no. 2326	29.05.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$^{152/154}$Eu	Estimated activity 5.0 GBq, $A_{31.12.2006}$ 4.82 GBq	lighting rod, ser. no. 2346, disc	29.05.2006
$^{152/154}$Eu	Estimated activity 5.0 GBq, $A_{31.12.2006}$ 4.82 GBq	lighting rod, ser. no.: 2336, disc	29.05.2006
$^{152/154}$Eu	Estimated activity 2.9 GBq, $A_{31.12.2006}$ 2.78GBq	lighting rod, ser. no. 1827, small cylinder	04.09.2006
$^{152/154}$Eu	Estimated activity 4.1 GBq, $A_{31.12.2006}$ 3.93 GBq	lighting rod, ser. no.: 1705, small cylinder	05.09.2006
$^{152/154}$Eu	Estimated activity 11 MBq, $A_{31.12.2006}$ 10.54GBq	lighting rod, ser. no. YVG-725, big cylinder	05.09.2006
$^{152/154}$Eu	2 sources 1. Estimated activity 2.1 GBq, $A_{31.12.2006}$ 2.01 GBq 2. Estimated activity 2.1 GBq, $A_{31.12.2006}$ 2.01 GBq	lighting rod 1.ser. no.: EuR no.4, small cyl-inder 2.Ser. no.: 2156, disc	05.09.2006
$^{152/154}$Eu	2 sources 1. Estimated activity 4.4, $A_{31.12.2006}$ 4.22 GBq 2. Estimated activity 4.4 GBq, $A_{31.12.2006}$ 4.22 GBq	2 lighting rods (big cylinders) 1.Ser. no.: 2279 2.Ser. no.: 2284	05.09.2006
$^{152/154}$Eu	Estimated activity 3.2 MBq, $A_{31.12.2006}$ 3.06GBq	lighting rod, ser. no.: 2222, disc	21.09.2006
$^{152/154}$Eu	Estimated activity 2.5 GBq, $A_{31.12.2006}$ 2.38 GBq	lighting rod, ser. no.: EuR no.2, small cylinder	11.10.2006
$^{152/154}$Eu	Estimated activity 3.8 GBq, $A_{31.12.2006}$ 3.62GBq	lighting rod, ser. no.: Eu 864, small cylinder	11.10.2006
$^{152/154}$Eu	Estimated activity 3.7 GBq, $A_{31.12.2006}$ 3.52GBq	lighting rod, ser. no.: Eu 1210, small cylinder	11.10.2006
$^{152/154}$Eu	Estimated activity 3.8 GBq, $A_{31.12.2006}$ 3.62GBq	lighting rod, ser. no.: Eu 1223, small cylinder	11.10.2006
$^{152/154}$Eu	Estimated activity 4.3 GBq, $A_{31.12.2006}$ 4.09 GBq	lighting rod, ser. no.: Eu 2199, disc	16.11.2006
^{60}Co	Estimated activity 37 MBq, $A_{31.12.2006}$ 32.87 MBq	lighting rod, ser. no.: YVG, 181, disc	24.11.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$^{152/154}$Eu	Estimated total activity: 5.0 GBq (23.02.2007) 1. Cu-plate – 1.9 GBq 2. Cu-plate – 1.5GBq 3. Cu-plate – 1.6GBq $A_{31.12.2007}$ GBq	lighting rod, serial no. Z-0401, (8 discs and 2 plates - inactive) + 3 Cu plates with radioactivity	08.02.2007
$^{152/154}$Eu	estimated 4.4 GBq $A_{31.12.2007}$ GBq	lighting rod, serial no. 2313, big cylinder	02.03.2007
$^{152/154}$Eu		lighting rod, serial no. Y-5102, source from the lighting rod not found	25.09.2007

Table III. *^{137}Cs sources*

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{31.12.2004}$ about 34.5 MBq	a needle	
^{137}Cs	20 sources $A_{31.12.2004}$ about 70.4 MBq each	needles	
^{137}Cs	$A_{31.12.2003}$ about 103.4 MBq	a needle	
^{137}Cs	$A_{INIT.}$ 22. 02. 1972. 111 MBq $A_{31.12.2004}$ 51.95 MBq	a sealed source which looks like a flat-iron	
^{137}Cs	$A_{31.12.2004}$ 86.14 GBq	a source in a lead container	
^{137}Cs	$A_{31.12.2004}$ 3 x 68.89 MBq	the sources are in a wooden case from inside coated with lead	
^{137}Cs	$A_{31.12.2004}$ 1.39 kBq	an old source in a lead case from a disused beta counter	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{Init.}$ 19.82 GBq (total, 11 sealed sources) 2 sources $A_{INIT.}$ 1.07 GBq 2 sources $A_{INIT.}$ 1.21 GBq 2 sources $A_{INIT.}$ 1.21 GBq 1 source $A_{INIT.}$ 1.23 GBq 1 source $A_{INIT.}$ 1.53 GBq 1 source $A_{INIT.}$ 1.53 GBq 1 source $A_{INIT.}$ 3.97 GBq 1 source $A_{INIT.}$ 4.58 GBq $A_{31.12.2004}$18.46 GBq (total)	the sources are in a common locked cylindri-cal container	
^{137}Cs	Source without protective container, $A_{init.}$ 2.66 GBq, $A_{31.12.2004}$ 2.50 GBq	a source (tube) placed into a lead container	
^{137}Cs	$A_{init.}$ 3.1 GBq, $A_{31.12.2004}$ 2.92 GBq	(type:LAB) No.: 1349, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.7 GBq, $A_{31.12.2004}$ 2.54 GBq	(type:LAB) No.: 1635, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.55 GBq, $A_{31.12.2004}$ 2.40 GBq	(type:LAB) No.: 301, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.45 GBq, $A_{31.12.2004}$ 2.31 GBq	(type:LAB) No.: 316, the source placed into a lead container	
^{137}Cs	$A_{31.12.2004}$ 696.81 MBq	corroded, num-ber unreadable, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 12.84 GBq, $A_{31.12.2004}$ 12.09 GBq	(type:LAB) No.: 402, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.85 GBq, $A_{31.12.2004}$ 2.69 GBq	(type:LAB) No.: 1625, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.51 GBq, $A_{31.12.2004}$ 2.60 GBq	(type:LAB) No.: 312, the source placed into a lead container	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{init.}$ 2.85 GBq, $A_{31.12.2004}$ 2.69 GBq	(type:LAB) No.: 1414, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 0.85 GBq, $A_{31.12.2004}$ 0.80 GBq	(type:LAB) No.: 1506, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.51 GBq, $A_{31.12.2004}$ 2.36 GBq	(type:LAB) No.: 313, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 13.60 GBq, $A_{31.12.2004}$ 12.81 GBq	(type:LAB) No.: 681, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.55 GBq, $A_{31.12.2004}$ 2.40 GBq	(type:LAB) No.: 317, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.67 GBq, $A_{31.12.2004}$ 2.51 GBq	(type:LAB) No.: 1217, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 10.91 GBq, $A_{31.12.2004}$ 10.27 GBq	(type:LAB) No.: 404, the source placed into a lead container	
^{137}Cs	$A_{init.}$ 2.91 GBq, $A_{31.12.2004}$ 2.74GBq	(type:LAB) No.: 1337, the source placed into a lead container	
^{137}Cs	$A_{init.}$ < 37 MBq, $A_{31.12.2004}$ < 35 MBq	a part of an equipment of unknown pur-pose	
^{137}Cs	unknown activity	unusual shape, unknown pur-pose	
^{137}Cs	$A_{INIT.\ 31.12.2000}$ 111 MBq, $A_{31.12.2004}$ 101.2 MBq	a long needle (RS)	
^{137}Cs	$A_{INIT.\ 31.12.2000.}$ 155 MBq, $A_{31.12.2004}$ 141.3 MBq	a long needle (RS)	
^{137}Cs	$A_{INIT.\ 31.12.2000}$ 121MBq, $A_{31.12.2004}$ 110.3 MBq	a long needle (RS)	
^{137}Cs	$A_{INIT.\ 31.12.2000}$ 55.5 MBq, $A_{31.12.2004}$ 50.6 MBq	a long needle (RS)	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{INIT.\ 31.12.2000}$ 92.5 MBq, $A_{31.12.2004}$ 84.3 MBq	a long needle (RS)	
^{137}Cs	$A_{INIT.\ 31.12.2000}$ 60.7 MBq, $A_{31.12.2004}$ 55.4 MBq	a short needle (RS)	
^{137}Cs	$A_{INIT.}$ 1325 MBq, $A_{31.12.2004}$1285.6 MBq	a sealed source serial no.:1204-5-89	
^{137}Cs	$A_{INIT.}$ 1325 MBq, $A_{31.12.2004}$1285.6 MBq	a sealed source serial no.:1210-5-89	
^{137}Cs	$A_{INIT.}$ 1325 MBq, $A_{31.12.2004}$1285.6 MBq	a sealed source serial no.:1206-5-89	
^{137}Cs	$A_{INIT.}$ 1325 MBq, $A_{31.12.2004}$1285.6 MBq	a sealed source serial no.:1202-5-89	
^{137}Cs	$A_{INIT.}$ 1325 MBq, $A_{31.12.2004}$1285.6 MBq	a sealed source, serial no.:1205-5-89	
^{137}Cs	$A_{INIT.}$ 1325 MBq, $A_{31.12.2004}$1285.6 MBq	a sealed source, serial no.:1207-5-89	
^{137}Cs	$A_{INIT.}$ 370 MBq (22.06.1989) $A_{31.12.2005}$ 258.5 MBq	sealed source CPN, USA	end 2004
^{137}Cs	$A_{INIT.}$ 31.03.2005 810 MBq, $A_{31.12.2005}$ 796 MBq	sealed source (brachytherapy) ser.no.:677	31.03.2005
^{137}Cs	$A_{INIT.}$ unknown B. D. 1 μSv/h	Small metal cyl-inder	31.03.2005
^{137}Cs	$A_{INIT.}$ 14.10.2005 1. 4228 GBq, $A_{31.12.2005}$1. 4159 GBq	sealed source (brachytherapy equipment, CURIETRON type. AMRA ser.no.:677) source ser. no. 3951	31.03.2005
^{137}Cs	$A_{INIT.}$ 14.10.2005 2.2957 GBq, $A_{31.12.2005}$2.2845 GBq	sealed source (brachytherapy equipment, CURIETRON type. AMRA ser.no. 677) source ser. no. 3985-3975	31.03.2005

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{INIT.}$ 14.10.2005 2.3219 GBq, $A_{31.12.2005}$2.3106 GBq	sealed source (brachytherapy equipment, CURIETRON type. AMRA ser.no. 677) source ser. no. 3984-3974	31.03.2005
^{137}Cs	$A_{INIT.}$ 14.10.2005 1.3879 GBq, $A_{31.12.2005}$1.3811 GBq	sealed source (brachytherapy equipment, CURIETRON type. AMRA ser.no. 677) source ser. no. 3977	31.03.2005
^{137}Cs	$A_{INIT.}$ 14.10.2005 3.2908 GBq, $A_{31.12.2005}$3.2748 GBq	sealed source (brachytherapy equipment, CURIETRON type. AMRA ser.no. 677) source ser. no. 3987-3986-3976	31.03.2005
^{137}Cs	$A_{init.}$ 02.09.2006 4.0 GBq, $A_{31.12.2007}$- 3.848 GBq	curietron source serial no. 1586	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 3.7 GBq, $A_{31.12.2007}$ 3.56 GBq	curietron source serial no. 1585	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 3.1 GBq, $A_{31.12.2007}$ 2.98 GBq	curietron source serial no. 1584	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 2.8 GBq, $A_{31.12.2007}$ 2.69 GBq	curietron source serial no. 1583	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.5 GBq, $A_{31.12.2007}$1.44 GBq	curietron source serial no. 1589	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.8 GBq, $A_{31.12.2007}$ 1.73 GBq	curietron source serial no. 459	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.8 GBq, $A_{31.12.2007}$ 1.73 GBq	curietron source serial no. 460	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 6.9 GBq, $A_{31.12.2007}$ 6.64GBq	curietron source serial no. 461	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 0.69 MBq, $A_{31.12.2007}$ 0.66 MBq	curietron source serial no. 1587	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 0.72 MBq, $A_{31.12.2007}$0.69 MBq	curietron source serial no. 1588	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.5 MBq, $A_{31.12.2007}$1.444 MBq	curietron source serial no. 1586**	02.09.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{init.}$ 02.09.2006 0.72 MBq, $A_{31.12.2007}$0.69 MBq	curietron source serial no. 1578***	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 3.4 GBq, $A_{31.12.2007}$ 3.27 GBq	curietron source serial no. 1972	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 3.4 GBq, $A_{31.12.2007}$ 3.27 GBq	curietron source serial no. 1973	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.4 GBq, $A_{31.12.2007}$. 1.35GBq	curietron source serial no. 51038	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.4 GBq, $A_{31.12.2007}$1.35GBq	curietron source	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 3.1 GBq, $A_{31.12.2007}$ 2.98 GBq	curietron source serial no. 1971	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 5.1 GBq, $A_{31.12.2007}$ 4.91 GBq	curietron source serial no. 51041	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 4.0 GBq, $A_{31.12.2007}$ 3.85 GBq	curietron source serial no. 1978	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 4.0 GBq, $A_{31.12.2007}$ 3.85 GBq	curietron source serial no. 50139	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 4.6 GBq, $A_{31.12.2007}$ 4.43 GBq	curietron source serial no. 51040	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.4 GBq, $A_{31.12.2007}$1.35 GBq	curietron source serial no. 51037	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 1.4 GBq, $A_{31.12.2007}$1.35 GBq	curietron source	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 48 MBq, $A_{31.12.2007}$ 46.18 MBq	needles for brachytherapy 10 needles, length 25 mm	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 57 MBq, $A_{31.12.2007}$ 54.84MBq	needles for brachytherapy 14 needles, length 45 mm	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 171 MBq, $A_{31.12.2007}$ 164.52 MBq	needles for brachytherapy 20 needles, length 60 mm	02.09.2006
^{137}Cs	$A_{init.}$ 02.09.2006 66 MBq per needle total act. 660 MBq, $A_{31.12.2007}$ 635.00 MBq	10 needles for brachytherapy ids: 1.5/2.5..2.48 (CDCS S4)	09.06.2006
^{137}Cs	$A_{init.}$ 02.09.2006 63 MBq per needle total act. 315 MBq, $A_{31.12.2007}$ 303.07 MBq	5 needles for brachytherapy ids: 1.5/2.5..2.48 (CDCS S4)	09.06.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{init.}$ 02.09.2006 132 MBq per needle total act.1320 MBq, $A_{31.12.2007}$ 1270.00 MBq	10 needles for brachytherapy ids: 3/4…5.2 (CDCS S5)	09.06.2006
^{137}Cs	$A_{init.}$ 02.09.2006 126 MBq per needle total act.756 MBq, $A_{31.12.2007}$ 727.36 MBq	6needles for brachytherapy ids: 3/4…5.2 (CDCS S5)	09.06.2006
^{137}Cs	$A_{init.}$ 02.09.2006 33 MBq per needle total act. 198 MBq, $A_{31.12.2007}$ 190.50 MBq	6 needles for brachytherapy ids: 1.5/2.45…1.3 (CDCS S16)	09.06.2006
^{137}Cs	$A_{init.}$ 02.09.2006 66 MBq per needle total act. 396 MBq, $A_{31.12.2007}$ 381.00 MBq	6 needles for brachytherapy ids: 3/4…2.6 (CDCS S17)	09.06.2006
^{137}Cs	$A_{init.}$ 02.09.2006 198 MBq per needle total act. 594 MBq, $A_{31.12.2007}$ 571.50 MBq	3 needles for brachytherapy ids: 4.5/5.5..7.8 (CDCS S40)	09.06.2006
^{137}Cs	$A_{init.}$ 02.09.2006 101 MBq per needle total act. 808 MBq, $A_{31.12.2007}$ 777.39 MBq	8 needles for brachytherapy ids: 4.5/5.5…4 (CDCS S4)	09.06.2006
^{137}Cs	$A_{init.}$09.2006 44.1 MBq, $A_{31.12.2007}$ 42.43 MBq	Sealed source serial no. N-C 203, source. no. P20 (Chicago) D/M Gauge	07.03.2006
^{137}Cs	$A_{init.}$09.2006 74 MBq, $A_{31.12.2007}$ 71.20 MBq	Sealed source serial no. Trox-ler 285666	
^{137}Cs	$A_{init.}$09.2006 132 MBq, $A_{31.12.2007}$ 127.00 MBq	Sealed source serial no. Trox-ler 1987	07.03.2006
^{137}Cs	$A_{init.}$09.2006 138 MBq, $A_{31.12.2007}$ 132.77 MBq	Sealed source serial no. Trox-ler 3490 no. Ac-5047	07.03.2006
^{137}Cs	$A_{init.}$09.2006 147 MBq, $A_{31.12.2007}$ 141.43 MBq	Sealed source serial no. Trox-ler 3489 no. 3491	07.03.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{137}Cs	$A_{init.}$09.2006 176 MBq, $A_{31.12.2007}$ 169.33 MBq	Sealed source (csa277), serial no. Troxler 96.12.72no. 3491	07.03.2006
^{137}Cs	$A_{init.}$09.2006 99.1 MBq, $A_{31.12.2007}$ 95.35 MBq	Sealed source Model NER-572, serial no. G 316AB/Cs-1196	29.09.2006
^{137}Cs	$A_{init.}$09.2006 2.4 GBq, $A_{31.12.2007}$ 2.31 GBq	Sealed source Model VL-1-196	29.09.2006
^{137}Cs	$A_{init.}$09.2006 2.1 GBq, $A_{31.12.2007}$ 2.02 GBq	Sealed source	29.09.2006
^{137}Cs	Est. activity 23.02. 2007 390 MBq per tube; B.D. 150 μSv/h $A_{31.12.2007}$ 381.71 MBq	10 tubes, 15 mm	23.02.2007
^{137}Cs	Est. activity 23.02. 2007 1850 MBq; B.D. 700 μSv/h $A_{31.12.2007}$ 1811.15 MBq	1 tube Φ 6 x15 mm	23.02.2007
^{137}Cs	Est. activity 19.04. 2007 6200 MBq; B.D. 2.4 mSv/h $A_{31.12.2007}$ 6101.94 MBq	Cylinder, no.7436	26.03.2007
^{137}Cs	Est. activity 19.04. 2007 6200 MBq; B.D. 2.4 mSv/h $A_{31.12.2007}$ 6101.94 MBq	Cylinder, no.7437	26.03.2007
^{137}Cs	Est. activity 19.04. 2007 6200 MBq; B.D. 2.4 mSv/h $A_{31.12.2007}$ 6 101.94 MBq	Cylinder No.7438	26.03.2007
^{137}Cs	Est. activity 19.04. 2007 6200 MBq; B.D. 2.4 mSv/h $A_{31.12.2007}$ 6 101.94 MBq	Cylinder, no.7439	26.03.2007
^{137}Cs	Est. activity 19.04.. 2007 130 MBq; B.D. 50 μSv/h $A_{31.12.2007}$ 127.92 MBq	Cylinder, no. 23181	26.03.2007
^{137}Cs	Est. activity 19.04.. 2007 130 MBq; B.D. 50 μSv/h $A_{31.12.2007}$ 127.92 MBq	Cylinder, no. 22966	26.03.2007
^{137}Cs	Est. activity 19.04. 2007 52 MBq; B.D. 20 μSv/h $A_{31.12.2007}$ 51.17 MBq	Cylinder, no. 11018	26.03.2007
^{137}Cs	Est. activity 19.04. 2007 52 MBq; B.D. 20 μSv/h $A_{31.12.2007}$ 51.17 MBq	Cylinder, no. 11019	26.03.2007
^{137}Cs	$_{Init.}$ A 1983. 2.405 GBq Est. activity 17.07. 2007 1.38 GBq; $A_{31.12.2007}$ 1.37 GBq	protective con-tainer serial no. Q 4621	17.07.2007

Table IV. *^{226}Ra sources*

Radio-nuclide	**ACTIVITY (A)**	**FORM**	**DATE STORED**
^{226}Ra	32 sources, total activity: 5.35 GBq	needles + tubes	
^{226}Ra	204 sources, total activity: 23.86 GBq	needles + tubes	
^{226}Ra	58 sources, total activity: 17.61 GBq	needles + tubes	
^{226}Ra	4 sources, total activity: 370 MBq	needles	
^{226}Ra	37.0 MBq	soil	
^{226}Ra	unknown activity	Siemens, E25 P8-090	
^{226}Ra	unknown activity	shining paint (speedometer scale)	
^{226}Ra	unknown activity, B.D. up to 100 μSv/h	a hemisphere (signalling de-vice), diameter 5-6 cm	
^{226}Ra	33.3 kBq	Nuclar Chicago-standard	31.03.2005
^{226}Ra	111 kBq	standard	31.03.2005
^{226}Ra	185 kBq	unsealed source, in a test tube with a cork	31.03.2005
^{226}Ra	370 kBq	unsealed source, in a test tube with a cork	31.03.2005
^{226}Ra	unknown, B.D. up to 10 μSv/h	a part of a boiler or pipe, Φ 70 cm, h 30-55 cm, round shape	21.12.2005
^{226}Ra	740 kBq (11.01.1979)	sealed source RA-20S-86	29.09.2006
^{226}Ra	Est. activity 23.02.2007 2300 MBq B.D. 2.2 mSv/h	1 cylinder, Φ 5 x 15 mm (No. SC 1649)	23.02.2007
^{226}Ra	Est. activity 23.02.2007 0.6 MBq B.D. 0.6 μSv/h	cupola	23.02.2007
^{226}Ra	Est. activity 23.02.2007 0.6 MBq B.D. 0.6 μSv/h	cylinder (in plastic), Φ 20 x 40 mm, model: 184622	23.02.2007
^{226}Ra	Est. activity 23.02.2007 185 MBq (per needle); B.D 180 μSv/h	3 needles, 30 mm	23.02.2007
^{226}Ra	Est. activity 23.02.2007 90 MBq (per needle); B.D 85 μSv/h	3 needles, 25 mm	23.02.2007

Radio-nuclide	ACTIVITY (A)	FORM	DATE STORED
^{226}Ra	Est. activity 23.02.2007 90 MBq (per needle); B.D 85 μSv/h	3 needles, 20 mm	23.02.2007
^{226}Ra	Est. activity 23.02.2007 410 MBq (per tube); B.D 400 μSv/h	5 tubes, 20 mm	23.02.2007
^{226}Ra	Est. activity 23.02.2007 140 MBq (per tube); B.D 180 μSv/h	4 tubes, 35 mm	23.02.2007
^{226}Ra	Est. activity 23.02.2007 185 MBq (per tube); B.D 130 μSv/h	4 tubes, 10 mm	23.02.2007
^{226}Ra	Est. activity 23.02.2007 230 MBq (per needle); B.D 220 μSv/h	8 needles, 6 mm	23.02.2007
^{226}Ra	Est. activity 23.02.2007 1640 MBq; B.D. 1.6 mSv/h	3 cylinders, Φ 6 x 60 mm	23.02.2007

Table V. *^{241}Am, ^{109}Cd, ^{3}H, ^{55}Fe, ^{63}Ni, ^{85}Kr, ^{90}Sr, ^{204}Tl, ^{241}Am/Be, ^{226}Ra/Be, ^{192}Ir sources, thorium and uranium compounds and telescope parts*

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{241}Am	$A_{INIT.}$ (22. 02.1972) 1.11 GBq	a sealed source of the form like a flat-iron	
^{109}Cd	$A_{INIT.}$ 30 MBq, $A_{31.12.2004}$ 10.42 MBq	a sealed source serial no. 9956 LU	
^{109}Cd	$A_{INIT.}$ 525 kBq, $A_{31.12.2004}$ 227 kBq	a sealed source serial no. 8427 LU	
^{55}Fe	$A_{INIT.}$ 320 MBq, $A_{31.12.2004}$ 193.5 MBq	a sealed source serial no. 6312 LG	
^{85}Kr	unknown activity	a source from a thickness gauge	
^{85}Kr	$A_{INIT.}$ 4.172 GBq, $A_{31.12.2004}$ 3.617 GBq	serial no. KR 630, in a welded capsule	
^{85}Kr	$A_{INIT.}$ 4.42 GBq, $A_{31.12.2004}$ 3.831 GBq	serial no. KR 606, in a welded capsule	
^{90}Sr	$A_{INIT.}$ 18.5 GBq, $A_{31.12.2004}$ 6.28 GBq		
^{90}Sr	6 sources $A_{init.\ per\ source}$ 129 MBq, $A_{31.12.2004}$ 6 x 115.2 MBq	two measuring heads	
^{90}Sr	$A_{init.}$ 174 MBq, $A_{31.12.2004}$ 104.7 MBq	in a lead container, Ser. no. 169	
^{90}Sr	6 sources, unknown activity	without labels and serial numbers; in lead containers	

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{204}Tl	5 sources $A_{init.}$ 3 X 3.7 MBq, A $_{31.12.2004}$ 0.6 MBq $A_{init.}$ 2 x 20.3 MBq, $A_{31.12.2004}$ 3.1 MBq	in working containers; known serial numbers	
unknown	3 sources, unknown activity	olive-green cylinders, length 67 cm, diameter 6-8 cm; parts of a telescope	
U (NATURAL)	unknown	uranium acetate, 205 g; small glass bottles (10 g each)	
U (NATURAL)	unknown (100 g uranium ace-tate) unknown (25 g uranium oxide)	uranium acetate, 100 g; uranium oxide, small glass bottles (10g, 100 g each)	
U (NATURAL)	unknown (50 g uranium-nitrate-6-hydrate) unknown (25 g uranium ace-tate)	uranium-nitrate-6-hydrate, a small glass bot-tle (50 g) uranium acetate, a small glass bottle (25 g)	
^{241}Am/Be	$A_{init.}$ 1.85 GBq (19. 06. 1989)	sealed source, CPN, USA	end 2004
^{241}Am	B.D. up to 10 μSv/h	in a weld shut plastic wrapper	31.03.2005
^{241}Am	3.7 GBq (init. 20.03.2002 and july 2005)	sealed source, serial no. ID A 10	07.07.2005
^{241}Am	$A_{init.}$ 14.8 GBq (1968) $A_{24.05.2007}$ 14.8 GBq	sealed source, disc (No. AMC – 1083)	24.05.2007
^{241}Am	$A_{init.}$ 14.8 GBq (1968) $A_{24.05.2007}$ 14.8 GBq	sealed source, disc (No. AMC – 1081)	24.05.2007
^{241}Am	$A_{init.}$ 14.8 GBq (1967) $A_{24.05.2007}$14.8 GBq	sealed source, disc (No. AMC – 611)	24.05.2007
^{241}Am	$A_{init.}$ 14.8 GBq (1967) $A_{24.05.2007}$ 14.8 GBq	sealed source, disc (No. AMC – 610)	24.05.2007
^{241}Am/Be	A $_{09.2006}$ 1.11 GBq $A_{31.12.2006}$ 1.11 GBq	sealed source (part of a device, Scheid, ser.no. 283666)	07.03.2006
^{241}Am/Be	A $_{09.2006}$ 1.85 GBq (19.07.1972)	sealed source (part of a device Troxler 1987)	07.03.2006
^{241}Am/Be	A $_{09.2006}$ 1.85 GBq (07.01.1974)	sealed source (part of a device Troxler 2845)	07.03.2006
^{241}Am/Be	A $_{09.2006}$ 1.85 GBq (24.09.1975)	sealed source (part of a device Troxler 3489)	07.03.2006
^{241}Am/Be	A $_{09.2006}$ 1.85 GBq (24.09.1975)	sealed source (part of a device Troxler 3490)	07.03.2006

RADIO-NUCLIDE	**ACTIVITY (A)**	**FORM**	**DATE STORED**
^{241}Am/Be	A $_{09.2006}$ 37.0 GBq (15.12.1979)	sealed source (Model 71-1, no. 71-1-271G)	29.09.006
^{241}Am/Be	A $_{09.2006}$ 111.0 GBq (18.10.1978)	sealed source (NB 672)	29.09.2006
^{241}Am/Be	A $_{09.2006}$ 111.0 GBq (15.10.1972)	sealed source (Model 71-1, no. NB 371)	29.09.2006
^{60}Co	$A_{31.03..2005}$ less than 74 MBq, $A_{31.12.2007}$ 51.5 MBq	Pb-container unsealed source in a small glass bottle (labels:7.4 ml; 30.34 mCi tot.; no production date)	31.03.2005
^{55}Fe	$A_{init.}$ 259 MBq, $A_{31.12.2007}$ 125.63 MBq	sealed source	31.03.2005
^{55}Fe	$A_{init.}$ 3.7 GBq (06/1995) $A_{31.12.2007}$ 143.05 MBq.	sealed source, disc (No. F 2734)	24.05.2007
^{55}Fe	$A_{init.}$ 3.7 GBq (06/1995) $A_{31.12.2007}$ 143.05 MBq	sealed source, disc (No. F 2733)	24.05.2007
^{55}Fe	$A_{init.}$ 3.7 GBq (06/1995) $A_{31.12.2007}$ 143.05 MBq	sealed source, disc (No.F 2735)	24.05.2007
^{55}Fe	$A_{init.}$ 3.7 GBq (11/1985) $A_{31.12.2007}$ 10.82 MBq	sealed source, disc (No. F 1454)	24.05.2007
^{55}Fe	$A_{init.}$ 3.7 GBq (03/2000) $A_{31.12.2007}$ 489.21 MBq	sealed source, disc (No. F 3005)	24.05.2007
^{55}Fe	$A_{init.}$ 3.7 GBq (03/2000) $A_{31.12.2007}$ 489.21 MBq	sealed source, disc (No. F 3004)	24.05.2007
^{3}H	2 sources 1.$A_{init.}$ 37 GBq (05/1977) 6.6 GBq (09.11.2007) 2.$A_{init.}$ 37 GBq (05/1977) 6.6 GBq (09.11.2007) $A_{31.12.2007}$ 6.55 GBq	sealed sources (radioactively marked substances) 1.serial no. F 806 2. serial no. F722	09.11.2007
^{192}Ir	A $_{09.2006}$ 37 MBq $A_{31.12.2007}$ 1.95 MBq	sealed source in a container	07.03.2006
^{85}Kr	$A_{init.}$ 3.7 GBq, $A_{06.05.2005}$ 783 MBq A $A_{31.12.2007}$ 659.4 MBq	serial no. 1578 BK in a welded capsule	06.05.2005
^{85}Kr	$A_{init.}$ 9.3 GBq, $A_{01.01.1987.}$ 9,3 GBq, $A_{31.12.2007}$ 2.38 GBq	serial no. K-1275-G., a part of a measuring head	20.02.2007

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
^{63}Ni	$A_{init.}$ 370 MBq	sealed source (gas croma-tograph /GC Philips)	16.03.2007
^{226}Ra/Be	$A_{09.2006}$ 74.0 GBq (26.04.1966.), $A_{31.12.2006}$ GBq	sealed source (part of a device Model 5846, no.74/ N.Chicago)	07.03.2006
^{226}Ra/Be	$A_{09.2006}$ 370 MBq (04.03.1966.)	sealed source (part of a device Model 5846, no.74/ N.Chicago)	07.03.2006
^{90}Sr	surface B.D. 10 μSv/h	plastic bottle	31.03.2005
^{90}Sr	$A_{init.}$ 370 MBq (1979), $A_{31.03.2005}$ 190 MBq, $A_{31.12.2007}$ 177.7 MBq	without serial no.	31.03.2005
^{90}Sr	$A_{init.}$ 555 MBq (1978) $A_{31.12.2007}$ 268 MBq	sealed source, disc (No. 15/75; GL 78/S)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1964), $A_{31.12.2007}$ 189 MBq	sealed source, disc (No. 16/64; P 248)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1968), $A_{31.12.2007}$ 209 MBq	sealed source, disc (No. 15/68; X 63)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1968),.$A_{31.12.2007}$ 209 MBq	sealed source, disc (No. 15/68; Y 366)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1965) $A_{31.12.2007}$ 194 MBq	sealed source, disc (No. 15/65; bb)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1968), $A_{31.12.2007}$ 209 MBq	sealed source, disc (No. 15/68; Y 362)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1968), $A_{31.12.2007}$ 209 MBq	sealed source, disc (No. 15/68; Y 361)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1967), $A_{31.12.2007}$ 204 MBq (6/2007)	sealed source, disc (No. 15/67; U 101	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1968), $A_{31.12.2007}$ 209 MBq	sealed source, disc (No. 15/68; Y 365)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1967), $A_{31.12.2007}$ 204 MBq	sealed source, disc (No. 15/67; U 100)	24.05.2007
^{90}Sr	$A_{init.}$ 555 MBq (1964), $A_{31.12.2007}$ 189 MBq	sealed source, disc (No. 15/68; X 64)	24.05.2007
^{90}Sr	$A_{17.07.2007}$ 950 MBq, $A_{31.12.2007}$ 187 MBq	sealed source, serial no. XN-1	17.07.2007
^{90}Sr	$A_{17.07.2007}$ 950 MBq, $A_{31.12.2007}$ 187 MBq	sealed source, serial no. VI-73	17.07.2007
^{90}Sr	$A_{17.07.2007}$ 950 MBq	sealed source, serial no. VI-74	17.07.2007
depleted uranium	unknown activity, approx. 12 kg gross weight	defectoscope GAMMAMAT, model-type D) DB-0024B(U), ser.no. 17-998	09.02.2007

RADIO-NUCLIDE	**ACTIVITY (A)**	**FORM**	**DATE STORED**
depleted uranium	unknown activity, approx. 12 kg gross weight	1. defectoscope GAMMAVOLT, SU-50,ser.no. 831417 2. defectoscope GAMMAVOLT, SU-100A,ser.no. 78838 3. defectoscope GAMMAVOLT, SU-100,ser.no 821250 4. defectoscope GAMMAVOLT, SU-100,ser.no 78874 5. defectoscope GAMMAVOLT, SU-100,ser.no 78876	07.09.2007
^{232}Th	surface B.D. up to 1 μSv/h	unsealed sources, in a plastic phial with a drop-per	31.03.2005
^{232}Th	surface B.D. up to 12 μSv/h	Sealed sources, from scrap metal, probably a part of a telescope	12.08.2005
^{232}Th	5 x 5 g.	plastic phials/test tubes each 5 g $Th(NO_3)_4$ x H_2O Thorium nitrate	31.03.2005
U (NATURAL)	25 g	small glass bottle $UO_2(OCOCH_3)_2$ x 2 H_2O uranyl acetate	31.03.2005
U (NATURAL)	10 x 10 g	small glass bottles $UO_2(NO_3)_2$ x 6 H_2O uranyum nitricum	31.03.2005
U (NATURAL)	100 g	small glass bottle $UO_2(NO_3)_2$ x 6 H_2O uranyum nitricum	31.03.2005
U (NATURAL)	100 g	small glass bottle $UO_2(OCOCH_3)_2$ x 2 H_2O uranyl acetate p.a.	31.03.2005
U (NATURAL)	100 ml	small glass bottle $UO_2(OCOCH_3)_2$ x 2 H_2O uranyl acetate	05.05.2005
U (NATURAL)	3 x 25 g	3 small glass bottles $UO_2(OCOCH_3)_2$ x 2 H_2O uranylacetat dihydrate p.a.	05.05.2005
U (NATURAL)	10 g	small glass bottle $UO_2(OCOCH_3)_2$ x 2 H_2O uranyl acetate p.a.	05.05.2005

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
$U_{(NATURAL)}$	approx. 100 g	small glass bottle $UO_2(OCOCH_3)_2$ x 2 H_2O uranyl acetate	05.05.2005
^{232}Th	10 g	small glass bottle thorium nitrate $Th(NO_3)_4$ x $4H_2O$	05.05.2005
$U_{(NATURAL)}$ $U_{(NATURAL)}$	80 g 20 g (2 x 10 g)	small glass bottle, 100 g uranyl nitrate 2 small glass bottles 25 g each uranyl acetate	18.05.2005
$U_{(NATURAL)}$	approx. 300g	glass bottle with uranium ore uranium(IV) oxide UO_2, ADU	22.03.2006
$U_{(NATURAL)}$	approx. 500 ml	solution in a 1l glass bottle uranyl oxycloratium $UO_2(ClO_4)_2$	22.03.2006
$U_{(NATURAL)}$	approx. 100 ml	solution in a 200 ml glass bottle uranyl oxycloratium $UO_2(ClO_4)_2$	22.03.2006
$U_{(NATURAL)}$	approx. 50 ml	crystals in a bottle uranyl nitrate $UO_2(NO_3)_2$	22.03.2006
$U_{(NATURAL)}$	250 g	glass bottle uranyl nitrate $UO_2(NO_3)_2$ x 6 H_2O	22.03.2006
$U_{(NATURAL)}$	50 g	glass bottle - 200g uranyl nitrate $UO_2(NO_3)_2$ x 6 H_2O	22.03.2006
$U_{(NATURAL)}$	100 g	glass bottle - 200g uranyl acetate $UO_2(CH_3COO)_2$ x 2 H_2O	22.03.2006
$U_{(NATURAL)}$	50 g	100 ml glass bottle uranyl nitrate (cryst) $UO_2(NO_3)_2$	22.03.2006
$U_{(NATURAL)}$	50 g	glass bottle uranyl nitrate (cryst) $UO_2(NO_3)_2$ p.a.	22.03.2006
$U_{(NATURAL)}$	2 x 100 g	glass bottles uranyl nitrate (cryst) $UO_2(NO_3)_2$ p.a.	22.03.2006

RADIO-NUCLIDE	**ACTIVITY (A)**	**FORM**	**DATE STORED**
U (NATURAL)	3 x approx. 10 g	50 ml glass bottles uranyl acetate $UO_2(CH_3COO)_2$ x 2 H_2O, RP	22.03.2006
U (NATURAL)	approx. 5 ml	50 ml glass bottle uranyl oxycloratium $UO_2(ClO_4)_2$	22.03.2006
U (NATURAL)	11 x approx. 25 g	glass bottles uranyl acetate $UO_2(CH_3COO)_2$ x 2 H_2O	22.03.2006
U (NATURAL)	5 x 10 g	glass bottles uranyl nitrate (cryst) $UO_2(NO_3)_2 + 6H_2O$ p.a	22.03.2006
U (NATURAL)	2 x 10 g	glass bottles uranyl acetaticum $UO_2(C_2H_3O_2)_2$ x 2 H_2O p.a.	22.03.2006
U (NATURAL)	32 x 5 g	glass bottles uranyl nitrate $UO_2(NO_3)_2 + 6H_2O$ p.a.	22.03.2006
U (NATURAL)	54 x approx. 1 g	20 ml plastic test tubes uranyl phosphate $NH_4UO_2PO_4$	22.03.2006
U (NATURAL)	56 x approx. 1 g	10 ml glass test tubes uranyl phosphate $NH_4UO_2PO_4$	22.03.2006
U (NATURAL)	7 x approx. 1 g of powder	glass Petri dishes uranium(IV)oxide UO_2	22.03.2006
^{232}Th	100 g	small glass bottle thorium nitrate $Th(NO_3)_4$ x H_2O p.a.	22.03.2006
^{232}Th	100 g	small glass bottle thorium chloride $ThCl_4$ + 8 H_2O	22.03.2006
unknown content	100 g	small glass bottle without a label	22.03.2006
Ce	10 g	small glass bottle cerium (IV) ammonium sulfuricum p.a. $Ce(SO_4)_2$ x 2 $(NH_4)_2SO_4$ + $2H_2O$	22.03.2006
U (NATURAL)	12 x 5 g	12 hermetically closed phials uranyl acetate $C_4H_6O_6U$x 2 H_2O	23.03.2007

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
U (NATURAL)	total 595 g,119 x 5 g	119 hermetically closed phials, 5 g each uranyl nitrate $UO_2(NO_3)_2$ x 6 H_2O	23.07.2007

***Table VI**. Natural sources (Th/U/Ra) found in metal waste*

RADIO-NUCLIDE	ACTIVITY (A)	FORM	DATE STORED
Th/U/Ra	2 sources, unknown activity, B.D. up to 15 μSv/h	circular and semicircular shape, diameter 70 cm	
^{226}Ra	unknown activity, B.D. from 1 to 5 μSv/h	5 sources (glowing paint)	28.02.2006
	unknown activity, B.D. up to 0.3 μSv/h	scrap iron	25.05.2006
	unknown activity, B.D. up to 0.3 μSv/h	2 metal safes, increased radioactivity found	03.09.2006
	unknown activity, B.D. up to 0.3 μSv/h	2 pieces of scrap iron (metal doors) with increased radioactivity	18.10.2006
	unknown activity, B.D. up to 2 μSv/h	deformed barrel with scrap iron, increased radioactivity	24.11.2006
	unknown activity, B.D. up to 0.3 μSv/h	3 sources, pressed scrap iron, increased radioactivity	06.12.2006
^{232}Th	unknown activity B.D. up to 10 μSv/h	a part of an aircraft engine (from scrap metal)	13.12.2006
^{232} Th	unknown activity, B.D. from 3 to 5 μSv/h	most probably a part of a tank telescope, len. 67 cm, Φ 6-8 cm	28.06.2007

***Table VII.** Radioactive smoke detectors with ^{241}Am and ^{226}Ra sources*

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	7098 sources of various activities 6 sources (uninstalled 1992) 53 sources (uninstalled 1994) 757 sources (uninstalled 1995) 621 sources (uninstalled 1996) 243 sources (uninstalled 1997) 2390 sources (uninstalled 1998) 448 sources (uninstalled 1999) 42 sources (uninstalled 2000) 818 sources (uninstalled 2001) 1720 sources (uninstalled 2002)	smoke detectors	
^{241}Am	24 sources, activity 33 kBq each	smoke detectors, type 301 G SALWICO JD-1	
^{241}Am	6 sources, activity 2.66 MBq each	smoke detectors type FES-5B	
^{241}Am	6 sources, activity 2.66 MBq each	smoke detectors type FES-5B	
^{241}Am	21 sources, activity 2.66 MBq each	smoke detectors type FES-5B	
^{241}Am	14 sources, activity 74 kBq each	smoke detectors type JD-1	
^{241}Am	346 sources (48 sources, each 74 kBq) (278 sources, each 2.66 MBq) (20 sources each 29.6 kBq)	smoke detectors type FES-5B, type IDD- 801, type NID-28, type JD-1,type F-716 and type IJD-5	
^{241}Am	4 sources, activity 59.2 kBq each	smoke detectors type FES-5B	
^{241}Am	386 sources 345 sources, activity 2.66 MBq each; 41 sources, unknown activity	smoke detectors type FES-5B and type SV-1 (Vinča)	
^{241}Am	3605 sources 2138 sources, type NIS, activity 74 kBq each 464 "plates" + 116 "cups" from NITTAN, activity 74 kBq each 321 "plates" + 155 "cups", from FES 5B, activity 2.66 MBq each 152 sources, type IJD5, activity 74 kBq each 34 sources, type STATITROL 301G7, activity 33.3 kBq each 225 sources, FES 5B	smoke detectors type NIS and from NITTAN FES 5B, type IJD5, STATITROL 301G7, FES 5B	

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	34 sources, activity up to 74 kBq each	smoke detectors type IDD 801S	
^{241}Am	40 sources, activity up to 2.66 MBq each	smoke detectors type FES-5B	
^{241}Am	2 sources, activity up to 74 kBq each	smoke detectors type IDD 801	
^{241}Am	8 sources, activity up to 74 kBq each	smoke detectors, 5 sources type IDD 801, 3 sources type JD 5	
^{241}Am	7 sources, activity up to 29.6 kBq each	smoke detectors, 7 sources type F-716	
^{241}Am	63 sources, activity up to 74 kBq each	smoke detectors, 63 sources type IJD-5,	
^{241}Am	24 sources, activity up to 33,3 kBq each	smoke detectors, 24 sources type APOLLO	
^{241}Am	28 sources, activity up to 2.66 MBq each	smoke detectors, 28 sources type FES 5B,	
^{241}Am	202 sources, activity up to 2.66 MBq each	smoke detectors, 202 sources type FES 5B,	
^{241}Am	17 sources, activity up to 2.66 MBq each	smoke detectors, 17 sources type FES 5B,	
^{241}Am	237 sources, activity up to 2.66 MBq each	smoke detectors, 237 sources type FES 5B,	
^{241}Am	12 sources, activity up to 74 kBq each	smoke detectors, 12 sources type IDD 801,	
^{241}Am	49 sources, activity up to 2.66 MBq each	smoke detectors, 49 sources type FES 5B,	
^{241}Am	76 sources, activity up to 2.66 MBq, 74 kBq or 33.3 kBq each	smoke detectors, 40 sources type FES 5B, 12 sources type IDD 801, 11 sources type IJD 5, 13 sources type SATITROL	
^{241}Am	19 sources, activity up to 2.66 MBq each	smoke detectors, 19 sources type FES 5B,	
^{241}Am	9 sources, activity up to 74 kBq each	smoke detectors, 9 sources type IDD 801,	
^{241}Am	61 sources, activity up to 2.66 MBq each	smoke detectors, 61 sources type FES 5B,	
^{241}Am	102 sources, activity up to 33 kBq each	smoke detectors, 102 sources type APOLLO,	

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	9 sources, activity up to 33 kBq each	smoke detectors, 9 sources type APOLLO series XP 95,	
^{241}Am	33 sources, activity up to 74 kBq each	smoke detectors, 15 sources IDD 801, 18 sources NITTAN, NID-28	
^{241}Am	60 sources, activity up to 74 kBq each	smoke detectors, 60 sources IDD 801,	
^{241}Am	83 sources, activity up to 74 kBq each	smoke detectors, 83 sources Nittan Salwico, type NID-28	
^{241}Am	176 sources, activity up to 74 kBq each	smoke detectors, 157 sources Nittan Salwico, type JD-1, 10 sources Nittan Salwico, type NID-28, 9 sources IDD 801	
^{241}Am	6 sources, activity up to 74 kBq each	smoke detectors, 4 sources JD-1 Salwico, 2 sources IDD 801	
^{241}Am	16 sources, activity up to 30 kBq each	smoke detectors, 16 sources I-716	
^{241}Am	10 sources, activity do 74 kBq each	smoke detectors, 10 sources type IDD-801	
^{241}Am	10 sources, activity up to 74 kBq each	smoke detectors, 10 sources type: IDD-801	
^{241}Am	46 sources, activity up to 74 kBq each	smoke detectors, 46 sources type: IDD-801	
^{241}Am	56 sources, activity up to 74 kBq each	smoke detectors, 56 sources type ODD-801”S”	
^{241}Am	5 sources, activity up to 74 kBq each	smoke detectors, 5 sources type IJD-5	
^{241}Am	70 sources 69 sources activity up to 74 kBq each 1 source, activity less than 555 kBq	smoke detectors, 69 sources type IJD-5 activity up to 74 kBq each 1 source type F600 activity up to 555 kBq each	

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	22 sources 1. 2 sources, activity up to 74 kBq each 2. 15 sources, activity up to 2.66 MBq 3. 5 sources, activity up to 33.3 kBq each	smoke detectors, 2 sources type IJD-5(ERA) activity up to 74 kBq each; 15 sources type FES 5B activity up to 555 kBq each; 5 sources STATITROL 301G7 activity up to 33.3 kBq each	
^{241}Am	47 sources, activity up to 74 kBq each	smoke detectors, 47 sources type: IDD-801	
^{241}Am	23 sources, activity up to 74 kBq each	smoke detectors, 2 sources type SALWICO; 2 sources type IDD-801; 3 sources type JD SALWICO 11 sources type IJD-5; 3 sources type IJD-5; 2 sources type IDD 801; 1 source type NID 48F	
^{241}Am	17 sources, activity up to 74 kBq each	smoke detectors, 15 sources type IJD-5 2 sources PASTOR-ZAGREB	
^{241}Am	5 sources, activity up to 2,66 MBq each	smoke detectors, type FES 5B	
^{241}Am	8 sources, activity do 2,66 MBq each	smoke detectors, type FES 5B	
^{241}Am	6 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	
^{241}Am	7 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	
^{241}Am	35 sources, activity do 74 kBq each	smoke detectors, type IDD 801	
^{241}Am	14 sources, activity up to 74 kBq each	smoke detectors, type IOJ-2	
^{241}Am	3 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	
^{241}Am	176 sources, 42 sources activity up to 74 kBq each 134 sources activity up to 33 kBq each	smoke detectors, 42 sources type IOJ-2 62 sources type STATITROL 72 sources TYPE APOLLO	

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	6 sources, activity up to 74 kBq each	smoke detectors, type NID-48	
^{241}Am	231 sources, activity up to 2.66 MBq each	smoke detectors, type FES 5B	
^{241}Am	81 sources, activity up to 29.6 kBq each	smoke detectors, type F-716	
^{241}Am	18 sources, activity up to 29.6 kBq each	smoke detectors, type F-716	
^{241}Am	7 sources, activity up to 74 kBq each	smoke detectors, 2 sources type IDD-801 5 sources type IJD-5	
^{241}Am	50 sources, 42 sources activity up to 74 kBq each 8 sources activity up to 33 kBq each	smoke detectors, 42 sources type IDD-801 8 sources APOLLO XP, ser. 95	
^{241}Am	45 sources, activity up to 33 kBq each	smoke detectors, 45 sources APOLLO XP, ser. 95	
^{241}Am	160 sources, activity up to 33 kBq each	smoke detectors, 160 sources type IOJ-2 EN	
^{241}Am	3 sources, activity up to 74 kBq each	smoke detectors, 2 sources type NID-48, 1 source type: JD-1	
^{241}Am	1 source, activity up to 74 kBq	smoke detectors, 1 source type IDD 801	
^{241}Am	13 sources, activity up to 74 kBq each	smoke detectors, 13 sources type IDD 801	
^{241}Am	71 sources, activity up to 74 kBq each	smoke detectors, 1 source type IDD 802N 8 sources type IDD 801N 62 sources type NID 28	
^{241}Am	17 sources, activity up to 74 kBq each	smoke detectors, 8 sources type IDD 801N 9 sources type IDD 801	
^{241}Am	13 sources, activity up to 74 kBq each	smoke detectors, 13 sources type IDD 801	

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	110 sources, 12 sources activity up to 74 kBq each 33 sources activity up to 33 kBq each 40 sources activity up to 29,6 kBq each 25 sources activity up to 2,66 MBq each	smoke detectors, 12 sources, type IDD 801 33 sources, type IOJ-2, IOJ-1 40 sources, type F-716 I 301 G STATITROL 25 sources, type FES 5B	
^{241}Am	32 sources, activity up to 74 kBq each	smoke detectors, 32 sources type IDD 801	
^{241}Am	63 sources, 54 sources activity up to 74 kBq each 1 sources activity up to 33 kBq each 8 sources activity up to 2,66 MBq each	smoke detectors, 54 sources type IJD 5 1 source type IOJ 3 8 sources APOLLO type XP 95	
^{241}Am	7 sources, activity up to 74 kBq each	smoke detectors, type IDD 801N	
^{226}Ra	28 sources of different activities	smoke detectors, type CERBERUS	
^{226}Ra	147 sources, activity 22 kBq each	smoke detectors, type NITAN NID	
^{226}Ra	152 sources, activity 2.22 kBq each	smoke detectors, type ESSER	
^{226}Ra	68 sources, activity 2.2 kBq each	smoke detectors, type KLAUSESSER 1052, NW 118/77	
^{241}Am	79 sources, activity up to 2.66 MBq each	smoke detectors, type FES 5B	14.01.2005
^{241}Am	15 sources, activity up to 74 kBq each	smoke detectors, type NID-48F	01.02.2005
^{241}Am	4 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	01.02.2005
^{241}Am	activity up to 74 kBq each	smoke detectors, type IDD-801	01.02.2005
^{241}Am	9 sources, activity up to 33.3 kBq each	smoke detectors, type 301 G DTATITROL	15.02.2005
^{241}Am	71 sources, activity up to 33.3 kBq each	smoke detectors, type IOJ-2 PASTOR	15.02.2005
^{241}Am	56 sources, activity up to 74 kBq each	smoke detectors, 54 type NID-28, 2 type IDD-801	09.03.2005
^{241}Am	activity up to 2.66 MBq	smoke detector, type FES-5B	31.03.2005
^{241}Am	13 sources, activity up to 2.66 kBq each	smoke detectors, type FES-5B	31.03.2005

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	100 sources, activity up to 74 kBq each	smoke detectors, 38 type IDO-801, 36 type IDD-801, 26 type NID 48F	31.03.2005
^{241}Am	2 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	05.04.2005
^{241}Am	activity up to 74 kBq	smoke detector, type IDD-801	13.04.2005
^{241}Am	3 sources, activity up to 74 kBq each	smoke detectors, type JD 5	15.04.2005
^{241}Am	16 sources, activity up to 74 kBq each	smoke detectors, 12 type IJD-5, 1 type IDD-801, 3 type NID-48	21.04.2005
^{241}Am	7 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	25.04.2005
^{241}Am	40 sources, activity up to 2.66 kBq each	smoke detectors, type FES-5B	03.05.2005
^{241}Am	4 sources, activity up to 74 kBq each	smoke detectors, type IJD 5	13.05.2005
^{241}Am	activity up to 74 kBq	smoke detector, type IJD 5	16.05.2005
^{241}Am	9 sources activity up to 33 kBq each (8 pcs.), activity up to 74 kBq (1 piece)	smoke detectors, 2 type IJD-5, 6 type EMETAG, 1 type IDDN 801	19.05.2005
^{241}Am	16 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	31.05.2005
^{241}Am	3 sources, activity up to 30 kBq each	smoke detectors, type CERBERUS F 716 V	13.06.2005
^{241}Am	18 sources, activity up to 30 kBq each	smoke detectors, 3 type CERBERUS F 716, 15 type ISKRA I 716	16.06.2005
^{241}Am	66 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	30.06.2005
^{241}Am	57 sources, activity up to 74 kBq each	smoke detectors, type NID-48F	12.07.2005
^{241}Am	2 sources, activity up to 74 kBq each	smoke detectors,1 type IJD-5, 1 type IDD 801	16.07.2005
^{241}Am	activity up to 74 kBq	smoke detector, type IDD 801	25.07.2005
^{241}Am	29 sources, activity up to 29.6 kBq each	smoke detectors, type CERBERUS F 716 I	09.08.2005
^{241}Am	activity up to 74 kBq	smoke detector, type IDD 801	16.08.2005

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	activity up to 74 kBq	smoke detector, type IDD 801	18.08.2005
^{241}Am	86 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	09.09.2005
^{241}Am	151 sources, activity up to 30 kBq each	smoke detectors, type F-716	19.10.2005
^{241}Am	13 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	27.10.2005
^{241}Am	90 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	23.11.2005
^{241}Am	7 sources, activity up to 74 kBq each	smoke detectors, type IJD-5	07.12.2005
^{241}Am	29 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	07.12.2005
^{241}Am	102 sources, activity up to 74 kBq or 2.66 MBq each	smoke detectors 22 type IDD-801 80 type FES-5B	07.12.2005
^{241}Am	57 sources, activity up to 74 kBq or 2.66 MBq each	smoke detectors, 28 type FES-5B, 28 type IDD 801, 1 type IOJ-2	07.12.2005
^{241}Am	19 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	20.12.2005
^{241}Am	activity up to 74 kBq	smoke detector, tip IDD-801	23.01.2006
^{241}Am	38 sources, activity up to 74 kBq each	smoke detectors, type Ei-UNIVERSAL DETRECK	23.01.2006
^{241}Am	109 sources, activity up to 2.66 MBq each (37 pcs.), up to 33.3 kBq each (16 pcs.), up to 37 kBq each (56 pcs.)	smoke detectors,37 type FES 5B, 16 type STATITROL, 56 type IOJ-1 (PASTOR)	03.02.2006
^{241}Am	4 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	08.02.2006
^{241}Am	7 sources, activity up to 74 kBq each	smoke detectors, 4 type IDD-801-¨S¨, 3 type IJD-5	10.02.2006
^{241}Am	57 sources, activity up to 74 kBq each	smoke detectors, type IDD-IOJ-2	16.02.2006
^{241}Am	60 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	16.02.2006
^{241}Am	activity up to 74 kBq	smoke detector, type IJD-5	24.02.2006
^{241}Am	107 sources, activity up to 30 kBq each	smoke detectors, type F-716	24.02.2006
^{241}Am	3 sources, activity up to 74 kBq each	smoke detectors, type IJD-5	07.03.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	142 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	15.03.2006
^{241}Am	42 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	31.03.2006
^{241}Am	9 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	03.04.2006
^{241}Am	13 sources, 8 with activity up to 44.4 kBq each, 5 with activity up to 74 kBq each	smoke detectors, 8 type MR-4, 5 type: ERA IJD-5	04.04.2006
^{241}Am	35 sources, 27 with activity up to 33,3 kBq each 8 with activity up to 74 kBq each	smoke detectors, type STATITROL, 8 type IDD-801	24.04.2006
^{241}Am	20 sources, activity up to 30 kBq each	smoke detectors, type F 716	24.04.2006
^{241}Am	103 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	24.04.2006
^{241}Am	79 sources, activity up to 2.66 MBq each	smoke detectors 103 type FES 5B	24.04.2006
^{241}Am	29 sources, 12 with activity up to 44,4 kBq each, 7 with activity up to 74 kBq each, 10 with activity up to 207 kBq each	smoke detectors 12 type MRI-4, 7 type IDD 801, 10 type EMETAG	24.04.2006
^{241}Am	29 sources, 6 with activity up to 44,4 kBq each, 1 with activity up to 74 kBq,10 with activity up to 33 kBq each, 11 with activity up to 74 kBq each,1 with activity up to 2,66 MBq	smoke detectors 6 type MRI-4,1 type IJD-5, 10 type Statitrol, 11 type IDD 801, 1 type FES-5B	24.04.2006
^{241}Am	42 sources, activity up to 74 kBq each	smoke detectors, type IDD 801	25.04.2006
^{241}Am	105 sources, 35 with activity up to 33.3 kBq each, 21 with activity up to 2.66 MBq each, 2 with activity up to 33 kBq each, 47 with activity up to 74 kBq each	smoke detectors, 24 type Statitrol, 20 type FES-5B, 10 type PASTOR IOJ-2, 1 type PASTOR JOJ-3,13 type JDD 48E, 17 type NID 48E, 8 type NID 28, 6 type IDD 801, 3 type IZOTRONICA, 1 type APOLLO, 1 type ESSER, 1 type cerberus	25.04.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	34 sources, activity up to 74 kBq each	smoke detectors, 34 type IDD 801	29.04.2006
^{241}Am	47 sources, 24 activity up to 74 kBq each, 23 with activity up to 33 kBq each	smoke detectors, 24 type NID 28, 23 type IJD-5	05.05.2006
^{241}Am	59 sources, activity up to 74 kBq each	smoke detectors, 59 type IDD 801	08.05.2006
^{241}Am	114 sources, activity up to 2.66 MBq each	smoke detectors, type FES 5B	17.05.2006
^{241}Am	20 sources, activity up to 29.6 kBq each	smoke detectors, type Cerberus	19.05.2006
^{241}Am	41 sources, 19 with activity up to 33 kBq each, 22 with activity up to 74 kBq each	smoke detectors, type IOJ-2, 22 type JD-1	26.05.2006
^{241}Am	activity up to 74 kBq	smoke detector, type IJD-5	05.06.2006
^{241}Am	19 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	07.06.2006
^{241}Am	activity up to 74 kBq	smoke detector, type JD-5	19.06.2006
^{241}Am	10 sources, activity up to 2.66 MBq each	smoke detectors, type FES 5B	07.07.2006
^{241}Am	activity up to 74 kBq	smoke detector, type IDD-801	19.07.2006
^{241}Am	activity up to 74 kBq	smoke detector, type JD-5	21.08.2006
^{241}Am	4 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	21.08.2006
^{241}Am	30 sources, 2 kom activity up to 74 kBq each 28 kom activity up to 33 kBq each	smoke detectors, 27 type IJD-5, 2 type IOJ-3, 1 type 301-G	21.08.2006
^{241}Am	35 sources, activity up to 207 kBq each	smoke detectors, type IJD EMETAG	04.09.2006
^{241}Am	17 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	04.09.2006
^{241}Am	4 sources, activity up to 30 kBq each	smoke detectors, type Cerberus F 712	15.09.2006
^{241}Am	12 sources, 9 with, activity up to 74 kBq each 1 activity up to 74 kBq, 2 with activity up to 22 kBq each	smoke detectors, 9 type IDD-801, 1 type IOJ-2, 2 type NITTAN	15.09.2006
^{241}Am	21 sources, activity up to 74 kBq each	smoke detectors, type IDD-801	09.10.2006

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	6 sources, activity up to 74 kBq each	smoke detectors, type IDD-801N	21.11.2006
^{241}Am	3 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	27.11.2006
^{241}Am	36 sources, activity up to 74 kBq or 25.9 kBq each	smoke detectors, 35 type IDD-801 and 1 type IOJ 3	27.11.2006
^{241}Am	15 sources, activity up to 2.66 MBq each	smoke detectors, type FES-5B	12.12.2006
^{241}Am	6 sources, up to 74 kBq each	smoke detectors, type IJD-5,1 type IDD-801	31.01.2007
^{241}Am	3 sources, up to 33 kBq each	smoke detectors, type ALZAZ	21.12.2006
^{241}Am	20 sources, up to 74 kBq each	smoke detectors, type IDD-801	14.02.2007
^{241}Am	17 sources, up to 33 kBq each	smoke detectors, type JOJ-2 PASTOR	28.02.2007
^{241}Am	28 sources, up to 33 kBq each	smoke detectors, type JOJ-2 PASTOR	28.02.2007
^{241}Am	167 sources, 91 up to 33.3 kBq each, 2 up to 2.66 MBq each, 28 up to 33 kBq each, 46 up to 74 kBq each	smoke detectors, 13 type Statitrol, 2 type FES-5B, 8 type PASTOR IOJ -2, 70 type PASTOR JOJ-3, 4 type IDD-81, 23 type IDD 801, 8 type IDD 801 Ex, 4 type IDD 802, 5 type APOLLO 90, 22 type APOLLO 95, 1 type IJD 5 ERA, 2 type NID 48-F, 5 type NITAN 54	28.02.2007
^{241}Am	2 sources, up to 74 kBq each	smoke detectors, type IDD-801	06.03.2007
^{241}Am	8 sources, up to 33,3 kBq each	smoke detectors, type statitrol 301G	08.03.2007
^{241}Am	28 sources, up to 74 kBq each	smoke detectors, type IDD 801,	16.03.2007
^{241}Am	24 sources, up to 2.66 MBq each	smoke detectors, type FES-5B,	16.04.2007
^{241}Am	22 sources, up to 74 kBq each	smoke detectors, type IDD 801,	19.04.2007
^{241}Am	34 sources, up to 2.66 MBq each	smoke detectors, type FES 5B,	17.05.2007

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	42 sources, up to 30 kBq each	smoke detectors, type F 716,	17.05.2007
^{241}Am	22 sources, up to 74 kBq each	smoke detectors, type IDD 801,	17.05.2007
^{241}Am	20 sources, up to 74 kBq each	smoke detectors, type IDD IJD,	17.05.2007
^{241}Am	182 sources, up to 2.66 MBq each	smoke detectors, type FES-5B	18.05.2007
^{241}Am	416 sources, 64 up to 30 kBq each, 18 up to 74 kBq each, 334 up to 2.66 MBq each	smoke detectors, 64 type F 716, 18 type IDD 801, 334 type FES-5B	18.05.2007
^{241}Am	145 sources, 49 up to 30 kBq each, 25 up to 33 kBq each, 71 up to 74 kBq each	smoke detectors, 49 type F 716, 25 type IOJ 2, 71 type IDD 801	18.05.2007
^{241}Am	64 sources, up to 74 kBq each	smoke detectors	21.05.2007
^{241}Am	16 sources, up to 74 kBq each	smoke detectors	30.05.2007
^{241}Am	164 sources 44 up to 33.3 kBq each, 21 up to 33.3 kBq each, 77 up to 74 kBq each, 14 up to 22 kBq each, 8 up to 207 kBq each	smoke detectors, 44 type Statitrol, 21 type Pastor IOJ- 2, 77 type IDD 801, 14 type nittan (uk), 8 type emetag	05.06.2007
^{241}Am	16 sources, up to 74 kBq each	smoke detectors, type IDD 801	21.06.2007
^{241}Am	8 sources, up to 74 kBq each	smoke detectors, type IDD 801N	16.07.2007
^{241}Am	28 sources, up to 74 kBq each	smoke detectors, type IDD 801	24.07.2007
^{241}Am	15 sources, up to 2.66 MBq each	smoke detectors, type FES 5B	27.07.2007
^{241}Am	7 sources, 6 up to 29,6 kBq each, 1 up to 74 kBq	smoke detectors 6 F 716 VI, 1 IDD 801	23.08.2007
^{241}Am	3 sources, up to 2.66 MBq each	smoke detectors, type FES 5B	28.08.2007
^{241}Am	23 sources, up to 74 kBq each	smoke detectors, type IJD-5	03.09.2007
^{241}Am	up to 555 kBq	smoke detector type F-600	03.09.2007

RADIO-NUCLIDE	ACTIVITY (A)	FORM/TYPE	DATE STORED
^{241}Am	37 sources, up to 74 kBq each	smoke detectors, 10 type IDD 801, 1 type IDD 801 S, 1 type NID 28, 13 type IJD 5, 7 type JD 1, 3 type NID 48, 1 type ALZIS, 2 type TZ	03.09.2007
^{241}Am	16 sources, up to 2.66 MBq each	smoke detectors, type FES-5B	03.09.2007 (9 pcs.); 04.09.2007 (7 pcs.)
^{241}Am	43 sources, up to 74 kBq each	smoke detectors, type IDD 801	03.09.2007
^{241}Am	7 sources, up to 555 kBq each	smoke detectors, type F-600	17.09.2007
^{241}Am	38 sources, up to 2.66 MBq each	smoke detectors, FES-5B	21.09.2007
^{241}Am	17 sources, up to 2.66 MBq each	smoke detectors, type FES-5B	02.10.2007
^{241}Am	1 sources, up to 74 kBq	smoke detectors, type JD 5	12.10.2007
^{241}Am	3 sources, up to 74 kBq each	smoke detectors, 2 type IDD 801, 1 type IDD 802	15.10.2007
^{241}Am	21 sources, up to 74 kBq each	smoke detectors, type IDD 801	17.10.2007
^{241}Am	up to 74 kBq	smoke detector, type IDD 801	23.11.2007
^{241}Am	17 sources, up to 2.66 MBq each	smoke detectors, type FES-5B	18.12.2007
^{241}Am	70 sources, up to 74 kBq each	smoke detectors, 16 type IDD 801 54 type IJD -5	20.12.2007
^{241}Am	81 sources, up to 74 kBq each	smoke detectors type IDD 801	20.12.2007
^{241}Am	2 sources, up to 74 kBq each	smoke detectors, type IDD 801	21.12.2007
^{241}Am	up to 74 kBq each	smoke detectors, type IDD 801	21.12.2007
^{241}Am	7 sources, up to 74 kBq each	smoke detectors type JD-1	28.12.2007
^{241}Am	up to 74 kBq	smoke detector, type IDD-801	28.12.2007

Table VIII. *Radioactively marked substances and standards ^{14}C, ^{3}H, ^{36}Cl, ^{133}Ba*

(stored 09.11.2005)

Substance	**Purchased** *(month/year)*	**Activity kBq** ***(μCi)*** *(without decay)*	**Activity kBq** ***(μCi)*** *(31.12.2007)*
		^{14}C	
NEN Androst-4-ene-3,17-dione-4-^{14}C	01/1971	**370** *(10)*	**370** *(10)*
NEN Estriol-4-^{14}C	01/1971	**333** *(9)*	**333** *(9)*
NEN Estrone-4-^{14}C	01/1971	**333** *(9)*	**333** *(9)*
NEN Glycine-UL-^{14}C	01/1971	**7400** *(200)*	**7400** *(200)*
NEN Androst-4-ene-3,17-dione-4-^{14}C	01/1971	**185** *(5)*	**185** *(5)*
Amersham Pregnenolon-4-^{14}C	12/1973	**1184** *(32)*	**1184** *(32)*
Amersham L-[U-^{14}C] Leucine	06/1976	**4810** *(130)*	**4810** *(130)*
Amersham L-[U-^{14}C] Arginine monohydro-chloride	11/1977	**222** *(6)*	**222** *(6)*
Amersham L-[U-^{14}C] Asparagine	11/1977	**333** *(9)*	**333** *(9)*
Amersham L-[U-^{14}C] Isoleucine	11/1977	**296** *(8)*	**296** *(8)*
Amersham L-[U-^{14}C] Serine	11/1977	**74** *(2)*	**74** *(2)*
Amersham L-[U-^{14}C]-Threonine	11/1977	**296** *(8)*	**296** *(8)*
Amersham 5α-Dihydro-[4-^{14}C]-testosterone (5α-DHT-[4-^{14}C])	05/1975	**277.5** *(7.75)*	**277.5** *(7.75)*
Amersham [4-^{14}C]Androst-4-ene-3,17-dione	01/1984	**370** *(10)*	**370** *(10)*
Amersham [etil-1-^{14}C] Atrazine	03/1984	**9250** *(250)*	**9250** *(250)*
NEN Androst-4-ene-3,17-dione-[4-^{14}C]	07/1992	**1850** *(50)*	**1850** *(50)*
NEN Dihydrotestosterone, [4-^{14}C]	04/1987	**1850** *(50)*	**1850** *(50)*
NEN Testosterone-[4-^{14}C]	07/1992	**8880** *(240)*	**8880** *(240)*
NEN Progesterone, [4-^{14}C]	09/1994	**17 94.5** *(48.5)*	**17 94.5** *(48.5)*

Substance	**Purchased** *(month/year)*	**Activity kBq (*μCi)*** *(without decay)*	**Activity kBq (*μCi)*** *(31.12.2007)*
Amersham [2-^{14}C]Thymidine-5´-diphosphate ammonium salt		**1850** *(50)*	**1850** *(50)*
Amersham [4-^{14}C] Testosterone	01/1984	**740** *(20)*	**740** *(20)*
TOTAL:		**42 707.25 (1154.25)**	**42 707.25** (1154.25)
^{3}H			
NEN L-Leucine-[4,5-^{3}H]	01/1971	**740** *(20)*	**97** (2.63)
NEN Epitestosterone-1,2-^{3}H (N)	05/1972	**9028** *(244)*	**1298** (35.07)
NEN 20α-Hidroxsypregn-4-ene-3-one-1,2-^{3}H (N)	05/1972	**8695** *(235)*	**1249** (33.77)
NEN 17α-Hidroxsyprogesterone-1,-^{3}H (N)	05/1972	**8769** (237)	**1260** (34.05)
Amersham [1,2,6,7(n) -^{3}H]-Progesterone (ne otvoreno)	06/1976	**9250** *(250)*	**1658** (44.81)
Amersham [1,2,6,7(n) -^{3}H]-Testosterone (ne otvoreno)	06/1976	**9250** *(250)*	**1658** (44.81)
Amersham, L-Leucine-4,5-^{3}H	06/1971	**740** *(20)*	**100** (2.71
NEN [2,4,6,7,16,17-^{3}H(N)]-Estradiol	08/1985	**7 696** *(208)*	**2 216** (59.90)
NEN Methyltrienolone [17α- methyl-^{3}H]-(R1881)	01/1986	**74** (2)	**23** (0.62)
NEN Moxestrol [11β- methoxy-^{3}H]-(R2858)	01/1986	**9 250** *(250)*	**2 845** (76.89)
NEN [1,2,4,5,6,7-^{3}H(n)]-Dihidrotestosteron (^{3}H-DHT)	02/1989	**3 700** *(100)*	**1 354** (36.61)
NEN Estradiol-[2,4,6,7,16,17-^{3}H(N)]	07/1992	**9 250** *(250)*	**4 065** (109.87)
NEN Dihydrotestosterone-[1,2,4,5,6,7-^{3}H(N)]	07/1992	**9 250** *(250)*	**4 065** (109.87)
TOTAL:		**85 692** (2316)	**21 888** (591.57)
^{14}C calibration standards			

Substance	**Purchased** *(month/year)*	**Activity kBq** ***(μCi)*** *(without decay)*	**Activity kBq** ***(μCi)*** *(31.12.2007)*
Packard Quenched C-14 Standards (10 standards)	11/1969	**166.5** *(4.5)*	**166.5** *(4.5)*
Packard Unquenched ^{14}C standard	08/1970	**1.85** *(0.05)*	**1.85** *(0.05)*
Amersham Quenched C-14 Standards (8 standards)	11/1982	**26.64** *(0.72)*	**26.64** *(0.72)*
DuPont Quenched LSC Standards NUCLIDE: C-14 (10 standards)	03/1990	**18.5** *(0.5)*	**18.5** *(0.5)*
TOTAL:		**213.49** (5.77)	**213.49** (5.77)
^{3}H calibration standards			
Packard Quenched H-3 Standards (10 standards)	11. 1969	**166.5** *(4.5)*	**20.59** (0.556)
Packard Unquenched ^{3}H Standard	05/1970	**2.59** *(0.07)*	**0.33** (0.009)
Amersham Unquenched ^{3}H Standard	04/1976	**1.48** *(0.04)*	**0.26** (0.007)
Amersham Quenched H-3 Standards (7 standards)	04/1976	**59.2** *(1.6)*	**10.51** (0.284)
Amersham Quenched Tritium Standards (7 standards)	04/1983	**59.2** *(1.6)*	**15.60** (0.422)
DuPont Quenched LSC Standards NUCLIDE: H-3 (10 standards)	05/1990	**44.4** *(1.2)*	**17.44** (0.471)
TOTAL:		**333.37** (9.01)	**64.73** (1.749)
^{36}Cl calibration standards			
Packard ^{36}Cl standard (1 standard)	08/1970	**0.74** (*0.02)*	**0.74** (*0.02)*
TOTAL:		**0.74 kBq** (0.02)	
^{133}Ba calibration standards			
^{133}Ba standard (1 standard)	12/1975	**333** *(9.0)*	**40** *(1.08)*
TOTAL:		**333** (9.0 μCi)	**40** (1.08)

The IMI storage inventory as of 2006

In the IMI storage there are few hundreds of sources (^{137}Cs, ^{60}Co, ^{152,154} Eu, ^{90}Sr, 8000 ^{241}Am sources from smoke detectors, etc.) which have been used in medicine and for industrial applications, in the form of sealed radiation sources. The great majority of radioactive sources in the storage are dismantled from radioactive lightning rods during period 1975 to 2000 (^{152}Eu and ^{60}Co). Original activity of these sources at the moment of installation was 7.8 GBq to 18 GBq per piece.

Table I. *List of sources in IMI storage*

Packaging	**Tube #**	**Radionuclide**	**Number**	**Activity (MBq)**
EKO/UKL 2006/1 (RED)	T1A	**^{152,154}Eu**	41-cylinder	118 955
	T1	**^{152,154}Eu**	20-ring	18 975
	T2	**^{152,154}Eu**	21-ring	40 945
	T3	**^{152,154}Eu**	15-ring	42 200
	T4	**^{60}Co**	52-ring	3 717
EKO/UKS-2004/1 (YELLOW)		**^{152,154}Eu**	4-holder	8 830
	T3A	**^{152,154}Eu**	11-cylinders	44 600
		^{60}Co	different shape	11 900
		^{137}Cs	various	69 882
SHIELDING 1	T5	**^{152,154}Eu**	3- holder	11 700
		^{60}Co	52-ring	3 235
	T7	**^{60}Co**	31-ring	1 666
		^{152,154}Eu	2 ring + 1 holder	12 000
	Green 1	**^{60}Co**	Various sizes	
	Green 2	**^{137}Cs**	Various sizes	
	White	**^{60}Co**	cut **60Co** wires	N/A
	T2A	**^{60}Co**	various sizes	15 661
		^{137}Cs	various sizes	99 100
SHIELDING 2	T6	**^{60}Co**	56-ring	3 103
DRUM 1	T8	**^{60}Co**	needles,cylinders	1 457
		^{137}Cs	needles,cylinders	4 863
		^{226}Ra	needles, tubes	580 260
	B-1	**^{90}Sr**	220 pc	
	B-2	**^{55}Fe, ^{85}Kr, ^{90}Sr**	100 pc + 56	
	B-3	**^{55}Fe, ^{85}Kr,^{147}Pm**	24 pc	
	226Ra	**^{226}Ra**	plates	N/A
		^{152,154}Eu	40 pcs	N/A
		^{137}Cs	radiography	N/A
		^{60}Co	level gauge	N/A
		^{60}Co	6 line sources	N/A
	Red	**^{241}Am-Be**	neutron source	370
	White	**Alfa-sources**	wires	N/A
		^{226}Ra	calib. source	N/A

Packaging	**Tube #**	**Radionuclide**	**Number**	**Activity (MBq)**
		unknown source	lead sheets pack	N/A
		unknown source	corroded container	N/A
		unknown source	Sign RADIOACTIVE	N/A
		damaged source-scale	Ra? or Th	N/A
	Can	**^{241}Am**	lead container-ribbon?	N/A
	White	**^{241}Am**		
		^{226}Ra-Be	Chicago Nuc-tube	
		^{226}Ra-Be	Chicago Nuc-tube	
		^{241}Am	2 packages in lead	
		^{241}Am	6 small lead tubes	
RADIUM CONTAINER	1	**^{226}Ra**	Original packaging	N/A
NEUTRON GAUGE	1	**^{241}Am-Be**	Original (orange)	1.11 GBq
DRUM 2		**^{241}Am**	SMOKE DETECTORS	
LEAD DEVICES	2	**^{60} Co**	2 gauge level con-tainers	
PLASTIC WESSELS	5	**^{241}Am**	SMOKE DETECTORS	
PLASTIC WESSELS	2	**^{226}Ra**	SMOKE DETECTORS	2,22 kBq/pc
Wooden Box	1	**^{241}Am**	SMOKE DETECTORS	
PLASTIC WESSELS	4	Various	Contaminated objects	