

Pursuant to Article 16(1) of the Law on Radiation and Nuclear Safety in Bosnia and Herzegovina ("Official Gazette of BiH" 88/07) and Article 61(2) of the Law on Administration ("Official Gazette of BiH" 32/02 and 102/09), the director of the State Regulatory Agency for Radiation and Nuclear Safety issues:

REGULATION
on the control of high-activity sealed radioactive sources and orphan sources

PART ONE – GENERAL PROVISIONS

Article 1
(Subject)

This regulation shall govern the obligations of legal persons in possession of high-activity radioactive sources (hereinafter: high-activity source); the activity levels that define high-activity sealed sources; obligations of the suppliers of high-activity sources; treatment of the orphan sources in the event of their detection; obligations of the authorization holder with regard to the orphan sources; obligations of the legal person dealing with scrap metal collection with regard to the detection of orphan sources; costs associated with the detection of orphan sources, and other important matters regarding high-activity sources and orphan sources.

Article 2
(Objective and contents)

The objective of this regulation is to prevent exposure of the occupationally exposed workers and the population to the ionizing radiation resulting from inappropriate control of high-activity sealed radioactive sources and orphan sources.

Article 3
(Definitions)

The terms and expressions, as used in this regulation, mean:

- a) *Recognized installation*: A facility authorized by the State Regulatory Agency for Radiation and Nuclear Safety (hereinafter: Agency) for the long-term or interim storage and as well for the disposal of radioactive sources.
- b) *Source container*: The containment of a sealed source, not being an integral part of the source but meant for transport, handling, etc.
- c) *High-activity source*: A high-activity sealed radioactive source containing a radionuclide whose activity at the time of manufacture or, if this is unknown, at the moment of its first placing on the market, is equal to or exceeds the activities given in Annex to this regulation.
- d) *Disused high-activity source*: A source no longer used or not intended to be used for the practice for which an authorization was granted.
- e) *Orphan source*: A sealed source, the activity level of which, at the time of its detection, was above the exemption level, and that is not under regulatory control either because it has never been under regulatory control or it has been abandoned, lost, misplaced, stolen or otherwise transferred to a new holder without the knowledge of the recipient and without notification to the Agency.
- f) *Operational control*: The control that means appropriate testing of the source integrity and the properties of the device containing a radioactive source.
- g) *Supplier*: A natural or legal person that supplies the users with the sources.
- h) *Transfer*: The source transfer from an authorization holder to another holder.
- i) *Manufacturer*: A legal or natural person that manufactures the sources.

PART TWO – HIGH-ACTIVITY SOURCES

Article 4 (Authorization)

The legal persons that intend to possess and use high-activity sources shall obtain an authorization under the Regulation on notification and authorization for practices involving ionizing radiation sources ("Official Gazette of BiH" 66/10).

Article 5 (Activity levels)

The activity levels that define high-activity sources are given in Annex.

Article 6 (Operational control tests)

- (1) The authorization holder in possession of the high-activity source shall contract a technical service authorized for radiation monitoring of the workplace with the aim of:
 - a) conducting operational control of the high-activity source in regular intervals not longer than one year,
 - b) conducting operational control in the event of an incident that can affect the high-activity source integrity, and conducting the tests that ensure hermetic sealing of the source and the lack of surface contamination.
- (2) The tests referred to in paragraph (1) shall be conducted under the latest edition of BAS ISO 9978.

Article 7 (Regular check of the location)

A least once a month, the authorization holder in possession of a high-activity source shall check the presence of the high-activity source on the location of its use or storage, functioning of the device containing the high-activity source, visibility of the markings, and keep records on the conducted checks under the applicable legislation.

Article 8 (Plan of measures)

The authorization holder in possession of a high-activity source shall make a written plan containing foreseen measures to prevent unauthorized access to the source, its loss, theft, damage in the event of fire, and other damages.

Article 9 (Actions of the authorization holder under specific circumstances)

- (1) The authorization holder in possession of a high-activity source shall promptly notify the Agency of the loss, theft or unauthorized use of the high-activity source.
- (2) After the fire or any occurrence that may damage a high-activity source, the authorization holder in the possession of a high-activity source shall ensure integrity check of each source and promptly notify the Agency of the action taken.
- (3) The use of the damaged high-activity source and its damaged equipment shall be prohibited.

Article 10
(Disused high-activity sources)

- (1) The authorization holder in possession of a high-activity source shall return the high-activity disused source to the contracted manufacturer or transfer the source to another authorized holder or to a recognized installation without any delay and within six months at the latest from the day of terminating the use of source.
- (2) The authorization holder in possession of a high-activity source shall promptly notify the Agency of the date of terminating the use of such source.
- (3) It shall be prohibited to transfer disused high-activity sources to the legal persons that are not authorized under the applicable legislation on radiation and nuclear safety.

Article 11
(Documentation)

- (1) The authorization holder in possession of a high-activity source shall have printed documentation that contains:
 - a) the data referred to in Article 12,
 - b) information on the radionuclide type,
 - c) information on the source activity at a reference date,
 - d) photographs of the source, source container and other equipment.
- (2) The documentation referred to in paragraph (1) shall be kept in a safe place other than the source location.

Article 12
(Obligations of the suppliers of high-activity sources)

The supplier of high-activity sources shall ensure:

- a) that all sources can be identified by a unique number in accordance with the markings required in the latest edition of BAS ISO 2919, in which the number shall be engraved or affixed to the source.
- b) that the source identification number is marked on the source container. If this is not feasible or in the case of reusable transport containers, the container shall have information on the identification, nature and activity of the source. In all cases, the container shall be marked with an appropriate symbol for the container of radioactive material in accordance with the latest edition of BAS ISO 7010.
- c) that each high-activity source has a photograph of its design type and its typical container.

PART THREE – ORPHAN SOURCES

Article 13
(Detection of orphan sources by the population)

- (1) The Agency shall lay down appropriate procedures on the way of notifying relevant authorities and the procedures to be followed by the population in any event of detecting orphan sources.
- (2) The procedures referred to in paragraph (1) shall be posted on the Agency's official web page.

Article 14
(Detection of orphan sources at the border crossings)

- (1) With the aim of detecting orphan sources at the border crossings, the Agency shall cooperate with the customs and police authorities that control export and import of goods.
- (2) The Agency shall issue a procedural guide to be followed by the authorities referred to in paragraph (1) regarding the handling of orphan sources at the border crossings.
- (3) The guide referred to in paragraph (2) shall be posted on the Agency's official web page.

Article 15
(Detection of orphan sources in the scrap metal yards and recycling plants)

- (1) Scrap metal yards and recycling plants shall have equipment for the detection of radioactive sources and employ a person trained in the procedures to follow in the event that an orphan source is detected and in the handling of the equipment.
- (2) The facilities referred to in paragraph (1) shall make an action plan for the detection of orphan sources.
- (3) The Agency shall issue a procedural guide regarding the handling of orphan sources in the facilities referred to in paragraph (1).
- (4) The guide referred to in paragraph (3) shall be posted on the Agency's official web page.

Article 16
(Contamination of metal)

- (1) Scrap metal recycling plants shall promptly notify the Agency of possible melting of orphan sources.
- (2) Further processing of contaminated metal without approval of the Agency shall be prohibited.

Article 17
(Information and training in orphan sources)

- (1) All authorization holders carrying out the practices involving radioactive sources shall inform and train exposed workers in the safe management of sources, possible consequences of the loss of control over sources, and actions in such cases.
- (2) The information and training shall be repeated at regular intervals and documented with the aim of preparing exposed workers for such events.
- (3) In the facilities where orphan sources are most likely to be found or processed, and particularly at the border crossings and in the facilities referred to in Article 15, the management and the staff shall receive appropriate training consisting of the following elements:
 - a) information about the possibility to be confronted with a radioactive source,
 - b) methods of visual detection of sources and their containers,

- c) basic information about ionizing radiation, its effects, and radiation protection measures,
 - d) action to be taken on the site where a source is detected or suspected.
- (4) An authorized technical service shall train the persons referred to in this Article.

Article 18
(Organization of the campaigns to recover orphan sources)

- (1) As needed, the Agency shall organize a campaign to recover orphan sources possibly left behind from practices involving radioactive sources.
- (2) In the event of recovering orphan sources during the campaign referred to in paragraph (1), all costs of managing the recovered orphan sources shall be borne from the Agency's budget.

Article 19
(Costs associated with the detection of orphan sources)

- (1) The costs of detection, remediation, transport, storage and all other actions necessary to place orphan sources under regulatory control, including decontamination, shall be borne by the last authorized holder of the source.
- (2) In the event of detecting orphan sources at the border crossings during the import or export of goods, the costs referred to in paragraph (1) shall be borne by the importer or exporter respectively.
- (3) If the source holder referred to in paragraph (1) cannot be identified, the costs referred to in paragraph (1) shall be borne from the Agency's budget.

Article 20
(Loss of control over the source)

The holder of an authorization for the possession and use of radioactive sources shall promptly notify the Agency of the loss of control over the radioactive source.

Article 21
(Actions with regard to suspected orphan sources at the border crossings)

- (1) It shall be prohibited to import the shipments suspected to contain an orphan source with detected increase in dose rate on the shipment surface of 50% and higher than the dose rate of natural radiation.
- (2) If the dose rate on the shipment surface is 50 times higher than the dose rate of natural radiation, or if the dose rate in the driver's cab is five times higher than the dose rate of natural radiation, the supplier shall ensure the intervention of an authorized technical service and the on-site implementation of radiation protection measures.

Article 22
(Cooperation of the Agency with other relevant authorities in the event of recovering orphan sources)

- (1) In the event of recovering an orphan source the last authorized holder of which is unknown, the Agency shall notify relevant police authorities for the purpose of their taking action within their powers.

- (2) The Agency shall notify competent ministries of health, other competent institutions and the public about recovered orphan sources with the aim of taking action to properly protect the population from ionizing radiation.

**Article 23
(Preventive measures)**

The holder of authorization for the possession and use of radioactive sources shall act under the applicable legislation on the radiation safety and nuclear security to prevent loss, abandonment, illegal transfer, illegal storage or disposal of the source.

PART FOUR – TRANSITIONAL AND FINAL PROVISIONS

**Article 24
(International cooperation)**

The Agency shall appoint a contact person responsible for international cooperation and exchange of information with other countries and relevant international organizations with regard to all matters relevant for the control of high-activity sources and orphan sources.

**Article 25
(Harmonization of business operations)**

The legal persons carrying out the practice involving ionizing radiation sources and the legal persons in the business of scrap metal storage and recycling shall harmonize their business operations with the provisions of this regulation within one year from the day of entering this regulation into force.

**Article 26
(Obligation of the authorization holders in possession
of high-activity sources)**

The authorization holders that were in possession of high-activity sources before entry of this regulation into force shall submit to the Agency, within six months from the day of entering this regulation into force, financial guaranties regarding the management of the sources after the termination of their use, or a copy of the contract on returning such sources to the manufacturer after the termination of their use.

**Article 27
(Entering into force)**

This regulation shall enter into force on the eighth day following that of its publication in the "Official Gazette of BiH."

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DIRECTOR
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ANNEX

Table: Activity levels that define high-activity sealed sources

For radionuclides not listed in the table below, the relevant activity levels are given in table 1 in the IAEA document "Dangerous quantities of radioactive material – D-values" (EPR-D-VALUES, 2006).

Radionuclide	Activity level (TBq)
Am-241	$6 \cdot 10^{-2}$
Am-241/Be	$6 \cdot 10^{-2}$
Cf-252	$2 \cdot 10^{-2}$
Cm-244	$5 \cdot 10^{-2}$
Co-60	$3 \cdot 10^{-2}$
Cs-137	$1 \cdot 10^{-1}$
Gd-153	$1 \cdot 10^0$
Ir-192	$8 \cdot 10^{-2}$
Pm-147	$4 \cdot 10^1$
Pu-239/Be ^(*)	$6 \cdot 10^{-2}$
Pu-238	$6 \cdot 10^{-2}$
Ra-226	$4 \cdot 10^{-2}$
Se-75	$2 \cdot 10^{-1}$
Sr-90(Y-90)	$1 \cdot 10^0$
Tm-170	$2 \cdot 10^1$
Yb-169	$3 \cdot 10^{-1}$

(*) – The given activity is for the alpha-emitting radionuclide.