National Policy on Radioactive Waste Management
Sri Lanka

Sri Lanka Atomic Energy Regulatory Council
No.977/18, Kandy Road, Bulugaha Junction,
Kelaniya

NATIONAL POLICY ON RADIOACTIVE WASTE MANAGEMENT
SRI LANKA

Contents

1. Introduction:

Sri Lanka has been using radioactive materials from 1962 and presently the radioactive material and sources are used in medicine, industry, research and agriculture. Absence of nuclear reactors, research reactors or radioisotope treatment facilities, the radioactive wastes generated are limited to Medicine, Industry, Research and Agriculture filelds. The high activity sealed sources at present in Sri Lanka are used for sterilization of medical products, irradiation of foods, external beam radiotherapy for treament of cancers, blood irradiation and agricultural research. The medium activity sealed radioactive sources are used for non destructive testing radiography, nuclear gauges and brachy theraphy for cancer treatments. The unsealed radioactive material is commonly used for nuclear imaging, cancer therapy, biological research and for tracer applications.

The radioactive wastes generated in Sri Lanka mainly include spent radioactive sources, disused radioactive sources, and contaminated items due to use of unsealed sources in medicine, industry & reserach.

Uses of radiactive sources & radioctive materials and management & disposal of radiactive sources & materials are regulated under the provisions given in Sri Lanka Atomic Energy Act No.40 of 2014.(Act). The Act has given powers under section 54 of the Act to formulate a Natioanl Policy on Radioactive Waste Management based on international norms.

The Sri Lanka Atomic Energy Regulatory Council (Council) has been established under section 9(1) of the Act as the regulatory authority in Sri Lanka for the regulation and control of practices involving ionizing radiation which also include regulation and control of radiactive watse management & disposal.

In terms of section 4 (g) of the Act, it is the duty of the Sri Lanka Atomic Energy Board (SLAEB) to build & opearte installations for the management & disposal of radioactive waste.

This policy includes a set of goals or requirments to ensure the safety and efficeint management of radioactive waste generated in the country now & in the future in non nuclear power applications of radiative materials & radiaoctive sources.

2. Justification for the need of policy:

2.1 The preparation of this policy helps to enhance further development of government administrative functions systematically and in accordance with the necessary requirements. It can also be utilized to establish an integrated radioactive waste management system by providing more detailed focused directions for policy makers and implementers covering the administrative & management structures in the Country.

2.2 At present no national legal documents are established in the Country with respect to the field on radioactive waste management and currently use the guidelines issued by the International Atomic Energy Agency (IAEA). Therefore, this policy can be used as a starting point for preparation of the above-mentioned legal documents including preparation of national strategies on radioactive waste management.

2.3 This policy helps the general public to obtain information & importance on radioactive waste management for general public and creation of public confidence in relation to the radioactive waste management.

2.4 This policy helps to give the information and procedure on radioactive waste management to the national stakeholders who is involved in this field and to identify their roles & responsibilities and adhere to the requirements of the Council. Further this policy is useful in promoting consistency of emphasis and direction within all of the sectors involved in radioactive waste management.

3. Scope:

3.1. To set up the principles, goals and requirements for the management, disposal, import and export of nuclear & radioactive waste.

3.2. To establish minimum requirements for protection of people & the environment now & in the future from harmful effects of ionizing radiation during management & disposal of radioactive waste.

3.3. To apply requirements for waste generated from use of radioactive sources & radioactive materials in medicine, industry, agriculture & research including waste generated from decommissioned irridiation facilities and for activities related to mining & processing of radioactive minerals.

4. Vision:

Protection of the Country from the potentially harmful effects of ionizing radiation.

5. Mission:

Protection of general public, patients, radiation workers and the environment from potentially harmful effects of ionzing radiation by implementing an efficient & effective regulatory regime.

6. Goals:

To provide coherent and comprehensive directions for radioactive waste management in the Country to meet the solutions for long term & short-term management of radioactive waste with entrusted accountability.

7. Objective:

The main objective of this policy is to set up generic leagal frame work, arrangements, mesures, actions and all necessary requirements needed to achieve the goal of the safe management of radioactive waste in a manner that protects human health and the environment now and in the future without imposing undue burdens on future generations and identification of roles &

responsibilities of the organizations & bodies concerned with radioactive waste management including the followings:

a) to achieve and maintain a high level of safety in radioactive waste management (RWM), through the enhancement of national measures and international cooperation, including where appropriate, safety-related technical cooperation;

b) to ensure that during all stages of radioactive waste management there are effective defences against potential hazards such that individuals, society and the environment are protected from harmful effects of ionizing radiation, now and in the future, in such a way that the needs and aspirations of present generation are met without comprising the ability of the future generations to meet their needs and aspirations;

c) to ensure that the peaceful nuclear applications fulfill all the requirements of nuclear safety & security and the principles of radiation protection which aim to protect the environment & human properties against the hazards & harmful effects of nuclear materials & ionizing radiation.

d) to ensure safety, security and safeguards of the radioactive waste storage facilities and waste repositories during operation and after closure;

e) to ensure that all radioactive waste is managed and disposed of in safe, secure and sustained manners through definitive responsibility allocation, enhancement of institutional and legal framework measures;

f) to ensure adequate financial, technical and human resources, available when needed and transparently managed, to provide for the safe, long term management of radioactive waste;

g) to enhance public confidence in radioactive waste management.

8. International Norms on Fundamental Safety Requirements

The safety requiremenst for use of ionizing radiation and management of radioactive waste are set up by the International Atomic Energy Agency (IAEA) and this policy is prepared in keeping with the above safety requirements. The safety requirments identified by the IAEA are as follows,

- **Responsibility for safety:** The prime responsibility for safety must rest with the person or organization responsible for the facilities and activities that give rise to radiation risks;
- **Role of government:** An effective legal and governmental framework for safety, including an independent regulatory body must be established and sustained;
- **Leader ship and management of safety:** Effective management of safety must be established and sustained in facilities and activities that give rise to radiation risks;
- **Justification of facilities and activities***:* Facilities and activities that give rise to radiation risks must yield an overall benefit;

- **Optimization of protection:** Protection must be optimized to provide the highest level of safety that can reasonably be achieved;
- **Limitation of risks to individuals***:* Measures for controlling radiation risks must ensure that no individual bears an unacceptable risk of harm;
- **Protection of present and future generations***:* People and the environment, present and future, must be protected against radiation risks;
- **Prevention of accidents:** All practical efforts must be made to prevent nuclear or radiation accidents;
- **Emergency preparedness and response***:* Arrangements must be made for emergency preparedness and response in case of nuclear or radiation incidents;
- **Protective actions to reduce existing or unregulated radiation risks:** These must be justified and optimized.

9. International & National Requirements:

Compliance required with international treaties and obligations applicable to radioactive waste management in Sri Lanka as well as with the relevant national regulations.

9.1. International Obligations and Applicable National Legislation:

Sri Lanka commits to sign the IAEA Joint Convention on the safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention).

Radioactive waste generated in Sri Lanka will be managed based on this policy and provisions given in the Sri Lanka Atomic Energy Act No.40 of 2014 and subsidiary regulations made under this Act in so far they are relavant to radioactive waste management. The national policy will also be used as a basis for the formulation/ amend / review of relevant national legislation, regulations and rules.

For the purposes of implementing a national policy and establishing a national strategy for radioactive waste management, Sri Lanka shall follow the latest guidelines of the IAEA regarding the definition and classification of radioactive waste**.**

10.Provision of Resources:

As the waste generator is administratively, technically and financially responsible for the short-term safe management of the radioactive waste in accordance with the national and international principles, the Council shall ensure that at the time of issuing licences the waste generator possess the above capabilities.

The Sri Lanka Atomic Energy Board (SLAEB) shall be responsible for provision of adequate human & financial resources for long-term management of radioactive waste and research & development activities for disposal of radioactive waste at the national level.

11.Policy Principles

11.1. Safety, Security & Emergency Management of Radioactive Waste

It is the responsibility of all parties as stated under section 13 in this Policy to make appropriate arrangements relevant to the such parties to protect individuals, society and the environment from the harmful effects of ionizing radiation due to radioactive waste both now and in the future and provision of the physical protection & security of facilities to prevent unauthorized access of individuals and the unauthorized removal of radioactive material.

(a) Safety & security of the radioactive waste should be dealt in accordance with requirements given in containing Regulations on Ionizing Radiation Protection and Safety of Radiation Sources & Regulations on Security of Radioactive Sources during Manufacture, Use or Storage

(b) National level radiactive waste storage facilities shall prepare emergency response plan, fire plan in collaboration with Sri Lanka Police, Armed Forces & Fire Brigade.

(c) Transporation of radioactive waste containing Category 1 radioactive sources (activity more than 15,000 Ci) shall be transported under the supervision & coordination with armed forces or local police based on the safety & security requirements laid down by the Council

11.2. Radioactive Waste Minimization:

The generators are required to minimize the generation of radioactive waste at the design (minimization at source), operation and decommissioning stages of facilities. Some of the main means for achieving waste minimization in the operational and decommissioning stages of facilities includes,

- Recycling or reuse of materials which are free of contaminations or slightly contaminated within the clearance level established by the Council.
- The use of the clearance concept for determining the materials that can be released safely from regulatory control.

11.3. Export and Import of Radioactive Waste:

a) Radioactive waste generated outside the Republic of Sri Lanka shall not be imported into the Country, unless a determination has been made by the Minister in consultation with the Council, that the import would be in the national interest and prior written approval for the same has been granted by the Council.

b) No person shall export radioactive waste generated within Sri Lanka, without the prior written approval of the Council and the consent of the importing country.

c) The user shall come to an agreement before the radioactive materials are imported with the Council that radioactive waste and disused & spent radioactive sources generated from such imports is sent back to the supplier at the Country of

manufacture for disposal after the end of the guaranty period of the sources or the sources are not expected to use for the intended purpose or when the request is made by the Council. All the expenses in connection with transport and arrangement for transport shall be borne by the user.

d) Sri Lanka intends to seek international and regional solutions for the long-term management of radioactive waste generated in the Country.

11.4. Management of Radioactive Waste:

Management of all types of radioactive wastes shall be carried out accordance with the requirements on rules, regulation & procedures relevant to the radioactive waste management established by the Council & the Central Environmental Authority.

The following options should be considered incompliance with the above requirements.

11.4.1 Disused Sealed Radioactive Sources (DSRS)

The disused sealed radioactive sources (DSRS) are the main component of the current national radioactive waste inventory in Sri Lanka. The management options for DSRS include:

a) Return of the DSRS to the supplier;

For DSRS which cannot be repatriated due to various reasons (Due to absence of repatriation agreement between importer and exporter, high expensive shipment cost, manufacturers are not traceable, unavailability of special form certification etc.), the assistance from IAEA and other international bilateral partners will be sought.

All possible measures should be taken to return the Category 1 radioactive sources (DSRS) to the manufacturer / supplier or an authorized radioactive waste operator outside the Sri Lanka as management of these sources are not feasible in Sri Lanka without burden to the future generation due to radiological properties of these Category 1 radioactive sources and their radiological activities.

Expenses related matters shall not be taken into consideration as reasons for not sending the Category 1 radioactive sources (DSRS) from Sri Lanka which can impose burden to the future generation.

b) Management of DSRS within the Country

The DSRS which cannot be repatriated to the manufacturer due to various reasons shall be stored and managed by the SLAEB at the request of the Council on behalf of the Sri Lankan government. Before any radioactive source under this situation is undertaken, the SLAEB shall provide a management plan of the particular radioactive source which will describe the management options of the source to the Council. It should also be described that how this management options are used not to burden any risk to the future generation.

The nominal cost may be levied by the SLAEB from the user.

11.4.2 Other Types of Radioactive Waste

The other main sources of radioactive waste in Sri Lanka are:

a. Orphan radioactive sources found in Sri Lanka;
b. Shipping containers containing radioactive sources or contaminated materials/scrap metals detained by the Sri Lanka Customs.
c. Short lived radioactive waste (half-life less than 100 days) generated from Hospitals & Research Institutes
d. Liquid discharges from Nuclear Medicine Departments from the hospitals
e. Decommissioning of irradiating facilities

The management options for above relevant categories include:

a. Store of these orphan radioactive sources at the Central Disused Radioactive Sources Storage (CDRSS) of SLAEB.
b. Return these shipping containers containing radioactive sources of contaminated materials /scrap metals to its origin.
c. Management within the user establishment using delay & decay method.
d. Management within the user establishment by delay & decay and dilute & disperse methods.
e. Send back to the manufacturer or store at Central Disused Radioactive Sources Storage (CDRSS) of SLAEB when satisfied with 11.4.1(b).

11.5. Naturally Occurring Radioactive Material (NORM)

Naturally Occurring Radioactive Material (NORM) arises from industries such as mineral sand extraction as a by-product, residue or waste. The NORM should be managed as per guide line given by the Council based on the information of volume of NORM and contents of radioactivity of various elements in the NORM.

11.6. Public Information, Awareness and Participation

The relevant parties involve in waste management should inform its intention to the public on proposed plan for waste management and get consultation from concerned parties and members of the public to aid in making related decisions.

12.Implementing the Policy

- This policy will be reviewed periodically and revised in the light of national and international circumstances prevailing at the time. The policy will be supported by:

  - National legislation, regulations and policies related to protection of persons and safety & security of radioactive sources.
  - International conventions & agreements signed by Sri Lanka with the IAEA & United Nations on safety, security & safeguards and political commitments given by Sri Lanka to the IAEA.

- IAEA and other international standards on safety and best practices in radioactive waste management;
- National radioactive waste management strategy;
- National circumstances.

- Council & SLAEB shall undertake in a cooperative manner with all relevant national authorities for the implementation & up grading of this national policy.
-

13.Allocation of Responsibilities:

The responsibilities for the management of radioactive waste in Sri Lanka are vested for the following main entities.

13.1. Government of Sri Lanka

The Government has to ensure and maintain the availability of the resources (human, financial, technical) in Sri Lanka to facilitate the implementation of this policy and the associated national strategy related to the management of radioactive waste.

13.2. Sri Lanka Atomic Energy Regulatory Council (Council)

a) Ensure the implementation of this policy with other relevant national regulatory authorities and other national entities;
b) Preparation of regulations in the area of radioactive waste management on behalf of the Honorable Minister in charge of subject of Atomic Energy.
c) Regulate and control the use of ionizing radiation applications and the management of radioactive waste
d) Maintenance of national registry for all radiation sources and radioactive materials in the Country
e) Enforce the implementation of the national regulations on radioactive waste management in a cooperative manner with other national governmental organizations;
f) Ensure the fulfillment of requirements for public & workers' safety during generation & management of radioactive waste.
g) Granting licenses and approvals for facilities which generate radioactive waste and radioactive waste management institutes.

13.3. Sri Lanka Atomic Energy Board (SLAEB)

a) Safe management of radioactive waste complying conditions given in the licence issued by the Council.
b) Collection, storage and management of ownerless orphan sources.
c) Ensuring a national coordinated approach to long term management of radioactive waste,

d) Fulfilling national and international obligations for long term management of radioactive waste.
e) Developing and implementing solutions for the long-term management of radioactive waste. These solutions are to be safe, economic (cost effective) and in accordance with national legislation & regulations.
f) Ensuring adequate competence and capacity within SLAEB in the field of radioactive waste and management;
g) Ensuring that radiation exposures resulted from the radioactive waste management, will be kept as low as reasonably achievable (ALARA), while taking into account economic and social factors;
h) Establishing and implementing a quality assurance program for all the stages of management of radioactive waste;
i) Establishing and operation of national facilities for the long –term management of radioactive waste;
j) Keeping records of all spent & disused radioactive sources stored and repatriated to other countries for disposal and sources conditioned for long term storage.
k) Setup a waste acceptance criterion for waste collected and stored at the waste storage facility of SLAEB.
l) Ensure that the packaging and packages of conditioned radioactive waste conform with the requirements established by the Council;
m) Ensure availability of adequate personnel with proper training for management of radioactive waste.
n) Apply adequate technical options and approaches for the predisposal and disposal of the radioactive waste.
o) Ensure that all the work connected with acceptance to disposal of radioactive waste is conducted in complying with regulations related to waste management.

13.4. Generators and Operators

Generators of radioactive waste or operators of radioactive waste storage and treatment facilities shall be responsible for:

- storage and treatment of radioactive waste according to the national legislations
- bear the financial responsibilities for management of radioactive waste that they generate until the time that ownership is transferred to the body responsible for their long-term management.
- Minimizing the generation of radioactive waste.
- bear the technical and administrative responsibilities for the safe & secure management of radioactive waste as long as the waste remains within their premises.
- Develop plan and construct radioactive waste processing and storage facilities in line with national legislations.
- Keeping records on the radioactive waste inventory and waste disposed to the environment.
- Establishing and implementing a quality assurance program for radioactive waste management;
- Waste shall be segregated and labelled and stored in accordance with requirements given in the national legislations.

14. Definitions

"Decommissioning" means administrative & technical actions directed at an irradiating facility as a whole or part of it in such a way to release it from the regulatory authority at the end of operational life and this includes the processes of decontamination and dismantling.

"Discharge" means a planned and controlled release of radionuclides into the environment. Such releases should meet all restrictions imposed.

"Disposal" means the emplacement of radioactive material in an appropriate facility without the intention of retrieval.

"Disused Radioactive Source" means a radioactive source which is no longer used, and is not intended to be used, for the practice for which an authorization has been granted.

"Ionizing radiation "means radiation capable of producing ion pairs in biological material.

"Joint Convention" means Convention on the safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, IAEA.

'Naturally Occurring Radioactive Material (NORM)' means radioactive material containing no significant amounts of radionuclides other than natullay ocuring radionuclides.

"Orphan radioactive sources" means a radioactive source which is not under regulatory control because it has never been under regulatory control, or because it has been abandoned, lost, misplaced, stolen, or transferred without proper authorization.

"Radioactive contamination" means unintended or undesirable radioactive substances any quantity in excess of the national permissible levels.

"Radioactive Waste" means material in whatever physical form, remaining from practices or interventions that contains or is contaminated with radioactive material and has a radioactivity or radioactivity concentration higher than the level set for clearance from regulatory requirements and for which no further use is foreseen.

"Spent Radioactive Source" means a radioactive source that is no longer suitable for its intended purpose as a result of radioactive decay.

"Storage" means the holding of radioactive sources or radioactive waste in a facility that provides for their/its containment with the intention of retrieval.

15. References

a) Policies & Strategies for Radioactive Waste Management, IAEA Nuclear Energy Series, No. NW-G-1.1, IAEA, Vienna, (2009)
b) Sri Lanka Atomic Energy Act No.40 of 2014
c) Regulations on Ionizing Radiation protection of the Atomic Energy Safety Regulations No.01 of 1999.