



REPUBLIC OF MAURITIUS

RADIATION SAFETY AND NUCLEAR SECURITY AUTHORITY

Guidelines for the Development of the Safety Assessment Report

May 2025

1.0 Background

Section 16(3) of the Radiation Safety and Nuclear Security (RSNS) Act 2018 requires any person applying for a licence to submit a Safety Assessment Report (SAR). The purpose of the SAR is to demonstrate that the intended radiation practice to be carried out by the applicant will be conducted in a safe and secure manner in compliance with the Act.

The Radiation Safety and Nuclear Security Authority (RSNSA) conducts a comprehensive review and assessment of each and every application for a licence using the SAR to ensure that the intended radiation practice will be conducted in a safe and secure manner. A licence is only issued upon the Authority being satisfied that the practice will be conducted in a manner that adequately ensures the protection to both people and the environment.

2.0 Safety Assessment Report

2.1 What is a Safety Assessment Report (SAR)?

A SAR is a legally binding document submitted by any person applying for a licence, to clearly demonstrate safety and compliance with all the regulatory requirements for the safe conduct of the intended radiation practice.

2.2 Why is a SAR required?

The SAR is a key element for the licensing of radiation practices which demonstrates safety and compliance with all the regulatory requirements for the safe and secure conduct of the intended radiation practice.

2.3 Who should develop the SAR?

The SAR should be developed by the appointed Radiation Protection Officer. Alternatively, the applicant may opt to hire a qualified expert for the development of the SAR.

2.4 What is the content and scope of the SAR?

Please refer to *Annex I* for more details on the structure and content of the SAR.

The headings/ sub-headings that are not relevant to the practice for which an application for a licence is being made, may be either omitted or denoted by “N/A” which stands for Not Applicable.

2.5 Submission of the SAR

The SAR should be submitted, in soft copy only in pdf format, to the RSNSA together with an application for a licence. It is to be highlighted that an application for a licence will not be processed until and unless a SAR is submitted to support the application for licence.

The soft copy of the SAR should be submitted to the RSNSA through its official email on rsnsa@govmu.org.

2.6 Maintaining the SAR

The SAR should be updated and submitted to the RSNSA within 3 months of the facility being operational, to reflect the current state of affairs. Thereafter, the SAR should be amended, upon the approval of the RSNSA, anytime there is an amendment to the radiation safety infrastructure at the facility. A history of the versions of the SAR should be maintained.

3.0 OBJECTIVE

The objective of this guide is to assist applicants in the development and submission of the SAR. The applicant should follow the structure provided, at *Annex I*, for the development of the SAR.

Structure of Safety Assessment Report

1. Applicant/ Licensee Profile

The applicant should provide a short description, of maximum 200 words, on its business line and activities.

2. Radiation Facility/ Practice

2.1 Description of facility

The applicant should provide a description of the facility where the radiation practice will be conducted.

2.2 Facility/ Location plan

A location plan of the facility where the radiation practice will be conducted has to be provided either using Google Map or GPS coordinates.

2.3 Radiation Practice details

The applicant should provide the scope of the intended radiation practice(s) to be carried out at the facility for which the authorisation from the Authority is being sought.

2.4 Technical Specification of Radiation Emitting Equipment

In this section, the applicant should provide the type of radiation emitting equipment to be used at the facility, with details of its technical specifications including the make, model, maximum machine ratings (maximum kV and mA), radionuclide, activity etc.

3. Safety Assessment

The applicant should conduct a comprehensive safety assessment to identify all the radiation risks to the different target groups due to the radiation practice to be conducted at the facility. For each identified risk, the safety assessment should mention the target groups at risk and the associated protection and safety measures to be implemented at the facility to eliminate or mitigate the risk.

3.1 *Design and Shielding*

In this section of the SAR, a plan layout of the room where the radiation practice will be conducted has to be provided, clearly showing -

- (i) the dimensions of the room;
- (ii) the position of the radiation emitting equipment in the room;
- (iii) the console area, if any;
- (iv) the occupancies of the surrounding areas;
- (v) details of any openings (windows, doors, etc.).

Details on the shielding of the said room, including the operator's console should be provided, if any, including:-

- (i) the shielding material used and its thickness;
- (ii) the height up to which shielding has been made;
- (iii) details of the lead glass window (viewing window) at the operator's console including the effective dimensions of the lead glass window and its lead equivalence.

Note:

- (i) The RSNSA recommends that the following design dose constraints levels are used -

Annual dose constraint levels for radiation workers	6 mSv*
Annual dose constraint levels for members of the public	0.3 mSv*
*mSv - millisievert	

- (ii) The assumptions made and the operational limits should be clearly defined (for e.g., expected weekly workload of the equipment, occupancy factor). It is to be highlighted that all assumptions made may serve as operational limits.
- (iii) A shielding calculation may be provided to confirm the adequacy of the shielding of the room which will house the radiation source for the safe conduct of the radiation practice.

4. Radiation Protection Programme

4.1 Allocation of Responsibilities

The applicant should appoint a Radiation Protection Officer (RPO) as required by section 20(1)(c) of the RSNS Act 2018 to oversee the application of the regulatory requirements and to ensure compliance with the RSNS Act 2018.

In this section, the applicant should provide the name and contact details of the appointed RPO for the radiation practice to be conducted. The applicant should describe the duties and responsibilities to be assigned to the appointed RPO to ensure the safe conduct of the radiation practice at the facility.

Additionally, the names of the operators who will be operating the radiation emitting equipment should also be provided. The responsibilities to be assigned to the operators should be clearly spelt out.

Documentary evidences to demonstrate the qualifications and experience of the RPO and the operators should be attached as annex to the SAR.

4.2 Training on Radiation Safety and Nuclear Security

All relevant personnel should be provided with training and periodic retraining in radiation safety and nuclear security.

In this section, the applicant should provide the information regarding the arrangements to be made for the continuous and periodic training of the radiation workers including the following -

- (i) scope of training to be provided to the personnel on radiation safety and nuclear security; and
- (ii) details of the trainer.

4.3 Individual Monitoring

All radiation workers who are likely to receive an effective dose of more than 1 mSv per year should be provided with a passive dosimeter from a dosimetry service provider approved by the RSNSA to monitor their occupational exposure to ionising radiation.

This section should describe the arrangements to be made for the monitoring of the occupational exposure of radiation workers to ionising radiation. This section should contain, but not limited to, the following information -

- (i) name and occupation of the radiation workers to be monitored;
- (ii) duration of the monitoring period; and
- (iii) name and details of the dosimetry service provider.

Note: The service provider should be approved by this Authority.

4.4 Workplace Monitoring

A workplace monitoring programme should be established in line with the ‘*IAEA Practical Radiation Technical Manual - Workplace Monitoring for Radiation and Contamination*’ to ensure a safe working environment for all workers at the facility.

This section should describe the arrangements on the workplace monitoring for an assessment of radiation levels in the vicinity of the radiation emitting equipment. The programme for workplace monitoring should specify -

- (i) the responsible person for the conduct of workplace monitoring;
- (ii) details of the radiation detecting equipment, including its energy range;
- (iii) strategic locations where measurements will be made; and
- (iv) actions to be taken in case radiation levels are not within limits.

4.5 Rules and Procedures

Rules and procedures should be developed to restrict exposure in radiation areas. The rules and procedures should be prominently displayed or readily available and communicated to all radiation workers.

4.6 Health Surveillance

A health surveillance programme, in accordance with the general principles of occupational health, should be established to assess the initial fitness and continuing fitness of the radiation workers for their intended tasks.

The applicant should provide details of the arrangements which will be in place for a radiation worker to be under a health surveillance programme to assess the continuing fitness of the radiation worker. Information on the Occupational Health Physician and the frequency of the health surveillance should also be provided.

4.7 Personal Protective Equipment

The applicant should provide details of the Personal Protective Equipment (PPE) to be provided to radiation workers, if any, for adequate protection against exposure to ionising radiation. The section should include -

- (i) the type and number of PPE to be made available;
- (ii) arrangements for the storage of the PPEs when not in use; and
- (iii) methods and procedures to assess the integrity of the PPEs, including frequency of tests performed on the PPEs.

4.8 Quality Control and Maintenance of Radiation Emitting Equipment

There should be arrangements in place for the regular maintenance of the radiation emitting equipment, as recommended by the manufacturer, by competent person(s). A

quality control programme should also be established to ensure the continued reliability of the radiation emitting equipment. This section should include information on -

- (i) the person responsible for the quality control programme;
- (ii) the international guidelines/protocols to be followed in establishing the quality control programme;
- (iii) lists of all Quality Control (QC) tests that will be performed on the radiation emitting equipment and their frequencies as per the manufacturer's recommendations;
- (iv) name, qualifications, and experience of the person(s) who will conduct the quality control tests;
- (v) equipment to be used for quality control tests; and
- (vi) actions to be taken if results fall outside tolerance limits.

4.9 Management System

A management system should be established and maintained for the safe and secure conduct of the radiation practice at the facility which clearly defines -

- (i) the roles and responsibilities of licensee/senior management and other personnel within the organisation who will have responsibilities for radiation safety and nuclear security; and
- (ii) the policies, procedures and working instructions relevant to radiation safety and nuclear security.

Note: Only brief details of the established policies, procedures and working instructions should be submitted and not the policies, procedures and working instructions themselves.

4.10 Promotion of Radiation Safety and Nuclear Security Culture

Safety culture should be promoted and maintained within the organisation and the facility.

This section of the SAR should describe the arrangements to be put in place to promote safety culture within the organisation and the facility.

Some examples of arrangements for promoting safety culture may include, but not limited to -

- (i) the setting up of a radiation safety committee;
- (ii) encouraging reporting of incidents;
- (iii) promoting awareness on radiation protection; and
- (iv) ensuring a common understanding of the key aspects of safety culture.

4.11 Record Keeping

Relevant records, pertaining to radiation safety and nuclear security, should be maintained at the facility.

This section of the SAR should include the list of records, pertaining to radiation safety and nuclear security, to be maintained at the facility including, but not limited to, the following -

- (i) Acquisition of radiation source;
- (ii) Installation and Commissioning Report;
- (iii) Maintenance and servicing Report;
- (iv) Q.C test Reports;
- (v) Training provided to the radiation workers;
- (vi) The dose records;
- (vii) Workplace monitoring Results;
- (viii) Health Surveillance Reports; and
- (ix) Emergency drills.

4.12 Management of Radioactive Waste

The applicant should provide information with regard to his/her intention with respect to the management of the radioactive source at the end of its useful life.

4.13 Transport of Radioactive Material

This section of the SAR should provide the following information -

1. a description of the mode of transport of the radioactive material. A picture of the vehicle(s) to be used for the transportation, if available, may be provided;
2. a description of the protection and safety measures which will be put in place for the safe transport of the radioactive material. The information provided should include, but not limited to, the following -
 - (i) how the radioactive material will be immobilised during transportation;
 - (ii) picture of the placards and details on the position the placards to be affixed on the vehicle during transportation;
 - (iii) measures for restricting exposure to ionising radiation of the driver and any other passenger in the vehicle; and
 - (iv) the instructions to be provided to the driver of the vehicle in case of emergency involving the radioactive material.
3. a description of the measures that will be in place for minimising the risk of theft or loss of the radioactive material during its/their transportation to the site.

4.14 Security of Radioactive Material

For category 1, 2 and 3 radioactive sources, a Site Security Plan should be developed and submitted as an annex to the SAR.

For category 4 and 5 sources, a description of the measures which will be put in place at the facility for restricting unauthorised access to the radioactive material for minimising the risk of its theft or loss during its use or storage should be provided.

4.15 Emergency Preparedness and Response

For Category 1, 2, 3 and 4 radioactive sources, an Emergency Response Plan should be developed and submitted as an annex to the SAR.

For Category 5 sources, this section of the SAR should include information regarding the emergency procedures to be followed in the event of foreseeable incidents such as, but not limited to, lost sources, stuck sources, contamination and accidental exposures of patients or workers.

4.16 Decommissioning

There should be a decommissioning plan developed for the decommissioning of the facility at the end of the useful life of the radioactive source. The decommissioning plan should be submitted as an annex to the SAR.

5. Declaration

The applicant or his representative should sign the declaration to declare that all information contained in the application, including any supplements attached hereto or submitted as part of the application, are true and accurate and commit to abide to all the protection and safety measures stipulated in the Safety Assessment Report.