NRRC Stakeholders Guidelines

Kingdom of Saudi Arabia

Application for Authorization of Decommissioning of Multi-Stage Facilities

NRRC-SG-003

2023

هيئة الرقابة النووية والإشعاعية
Nuclear and Radiological Regulatory Commission

Stakeholder Guideline

Application for Authorization of Decommissioning of Multi-Stage Facilities

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Preamble

In accordance with the provisions of the NRRC's approved Regulations, this stakeholder guideline describes criteria and/or techniques that are considered appropriate for satisfying the requirements stipulated in the NRRC's regulations.

This stakeholder guideline has been prepared on the basis of International Atomic Energy Agency (IAEA) standards, as well as the and the international best practices and the experiences of similar international regulatory bodies, and in accordance with the Kingdom's international commitments, and it has been approved by the NRRC's CEO resolution No. 1404 dated 23/07/2023.

Contents

1. Purpose

Nuclear and Radiological Regulatory Commission (NRRC) has developed an effective regulatory framework for the safe and secure authorization for the Decommissioning of facilities. Under the regulatory framework, the prime responsibility for safety and security of Decommissioning lies with the authorized person.

The purpose of this guideline document is to give the applicant and/or the authorized person a clear and specific guidance on the submission for the purpose of multi-stage decommissioning facilities authorization.

2. Scope

This guideline is addressed to facilities that intending to decommission, in particular, will address the management system, radiation protection, safety and security aspects decommissioning plan, including storage and transport. However, it is considered appropriate that a graded approach in the application of the requirements will be taken into account and should be adapted to the risks inherent to each facility.

This guideline includes the required information relating to radiation safety and security by the NRRC in order to verify the adequacy of the proposed safety and security measures as part of the authorization process.

This guideline applies for new authorization (License issuance), renewing the license as well as the license amendment.

3. Definitions

Decommissioning

Administrative and technical actions taken to allow the removal of some or all of the regulatory controls from a facility.

Controlled area

A defined area in which specific protection measures and safety provisions are or could be required for controlling exposures or preventing the spread of contamination in normal working conditions, and preventing or limiting the extent of potential exposures.

Supervised area

A defined area not designated as a controlled area but for which occupational exposure conditions are kept under review, even though specific protection measures or safety provisions are not normally needed.

4. Abbreviations

Abbreviation	Definition
NRRC	Nuclear and Radiological Regulatory Commission
RPP	Radiation Protection Program.
RSO	RSO: Radiation Safety Officer.
QC	Quality Control.
SP	Security Plan

5. General and Administrative Information

The applicant should fill and sign the application form.

6. Integrated Management System

6.1. Management structure and responsibilities, the applicant should provide the following:

- Describe overall organizational system and integrated management system assuring that protection and safety and security are effectively incorporated into the overall management system of the applicant.

- Describe and clearly define responsibilities for radiation safety and security for the following parties as appropriate: RSO(s), person responsible for security, workers, itinerant workers, radiation safety committee and clients including responsibilities for cooperation and consultation.

- Provide security roles and responsibilities.

- Document the assignment of all roles and responsibilities with respect to the security of radioactive material, including the roles and responsibilities of the following:

    - Site leadership, management, and supervisors.
    - Positions directly responsible for the security of radioactive material.
    - Positions with responsibility for regulatory matters, including any positions such as the licensee, radiation

safety officer, security personnel, advisers, guards, and other security related positions specifically required by regulation. Provide an organization chart showing the staffing structure with lines of authority and supervision to demonstrate how the security organization and responsibilities fit within the overall site organization.

6.2. Facility operating history

This subsection should provide a short operational history of the facility to include any significant events that may have occurred which might have an impact on decommissioning.

Events that could have had a significant impact on the physical form of the facility such as major modifications or renovations should be identified.

6.3. Description of the decommissioning strategy, including:

- Alternatives considered.
- Rationale for chosen strategy.
- Techniques and timeframe of the decommissioning:

This subsection describes how the project schedules will be prepared, such as what software will be used if applicable. It also describes the procedures for evaluating the decommissioning tasks and developing the schedules for each task. The review and

approval procedure for the schedules should be presented. A description of how the schedules is managed during the project (i.e. how they are issued, maintained, revised and terminated) is provided.

6.4. Contractor support

A listing of decommissioning tasks that will be performed by contractors should be provided. The management interfaces that will be in place between the licensee's management and on-site supervisors and the contractor's management and on-site supervisors should be well described. The boundary between the responsibility of the contractor and the responsibility of the licensee should be well defined. The contractor's project organizational structure should be described, and an organizational chart provided. A clear definition of the roles of the implementing organization and of the project management organization should be provided. An explanation of the responsibilities and duties of each Contractor organizational unit should be provided and the key personnel within each of these units should be identified. This subsection should provide the minimum qualifications for the key positions and shows the actual qualifications of the contractor's individuals filling these positions. The oversight responsibilities and authority that the licensee will exercise over the contractor

personnel should be described. The training that will be provided by the licensee to the contractor personnel and the training that will be provided by the contractor to its employees should be described.

6.5. Record keeping program

The records that must be obtained should be identified and their retention period and eventual disposition should be discussed. The organizations responsible for the maintenance of the records should be identified and the location where the records will be kept should be also identified. The method for storing the records (for example, electronically or paper copies) should be described.

7. Technical Information

The operating organization is required to prepare a decommissioning plan for the facility, including the following: The applicant should provide description of the facility as following:

- **Building and system description:**

A general description of the building(s), major facility systems and auxiliary equipment should be provided. This subsection also provides building drawings that indicate areas within the building(s) that will be included in the decommissioning project.

Engineering schematics and system layout drawings sufficient to provide a general knowledge of the systems and major components that will require removal or decontamination during decommissioning are provided.

The following detailed information should be given:

- Building construction: the type of construction used (for example, steel, reinforced concrete or pre-engineered construction materials), description of roof, existence of basements, crawl spaces and building access; description of building layout, schematic diagrams of rooms and facility layout identifying large components; and description of contents and purpose of each room and area.

- Major components: the major equipment and components operated within the building, to include facility equipment layout; the equipment associated with the facility operation that may require decontamination, dismantling or release from control; and the construction material of the equipment or systems.

- Building service systems: all the building systems (for example, cooling, ventilation, water, electricity, compressed air and cranes) that will be required to remain in operation for the dismantling of facility components. Those systems that can be removed immediately are identified.

8. Safety Assessment

8.1. The safety assessment should address the following aspects:

- Expected occupational exposure doses to be used as safety criteria.
- Operational limits and conditions.
- Hazard analysis of normal decommissioning activities.
- Hazard analysis of abnormal events and incidents.
- Assessment of potential consequences.
- Preventive and mitigating measures including:
  - radiation protection plan; and.
  - industrial health and safety plan.
- Risk assessment.
- Comparison of analysis results with relevant safety criteria.

8.2. Assessment of the final condition of the area in terms of radiological safety (including radiation survey, wipe test, etc) and description of its future use, where applicable

9. Radiation Protection Program

The applicant should provide radiation protection program as follow:

9.1. Protection of Workers

9.1.1. Education and training of workers.

- The applicant should specify names, qualification, education, training, and retraining.

9.1.2. Personal dosimetry.

- The applicant should specify and provide the personnel dosimetry service and arrangements related to monitoring of personal doses.

9.1.3. Itinerant workers.

- The applicant should describe the allocation and documentation of the responsibilities of the employer and the applicant for safety and protection of itinerant workers.

9.1.4. Personal protective equipment.

- The applicant should demonstrate that need to rely on administrative control and personal protective equipment for protection and safety is minimized giving the priority to engineering controls.
- The applicant should demonstrate that appropriate personal protective equipment is provided, and arrangements are made for its proper use, testing and maintenance.

9.2. Protection of the Public

- System of protection and safety to protect members of the public:
    - The applicant should describe the system of protection and safety to protect members of the public.
    - The applicant should demonstrate that optimization of radiation protection of public is in place.
    - The applicant should demonstrate that assessment, control, and surveillance of external exposure of public are in place, i.e., use of dose constraints for the member of the public. Provide assumptions used to assess external exposure of public.
    - The applicant should describe training of personnel having functions relevant to protection and safety of members of the public. Demonstrate that monitoring program and management of records are in place.
    - The applicant should describe the use of signs, labels, marks, and notices to be noticed by members of the public. Confirm that they are in a language to be understood by members of the public.

10. Physical security plan

10.1. Access authorization.

- The applicant should describe the process used for autho-

rizing personnel who need unescorted access to radioactive source locations during decommissioning stage, secured areas, including how the following functions are performed:

- Verify individuals holding the identified positions are trustworthy.
- Verify individuals holding the identified positions have the necessary training.
- Conduct periodic review and re-evaluation for particular circumstances, such as withdrawing access authorization when personnel or positions no longer have need for unescorted access, transfer of job responsibilities, or termination of employment.
- Maintain up to date records of personnel authorized for unescorted access.

10.2. Access control.

- The applicant should describe the physical measures for controlling access, including:
  - How personnel are physically controlled at each control point to limit access only to authorized persons according to the access authorization procedure and to prevent unauthorized access.
  - Specific media used to authenticate the identity of authorized persons such as key card, personal identification number, biometric device, or a combination.

- Procedures to be followed by authorized persons to access a secured area, including application of the two-person rule, where relevant.

10.3. Procedures for transfer of radioactive material.

- The applicant should describe the procedures for ensuring that security and control of a radioactive source is maintained when transferred to another authorized person.

10.4. Security during emergencies and contingencies.

- The applicant should summarize arrangements and actions to be taken during non-security emergencies or other contingency situations to ensure the protection of the radioactive material is maintained.

10.5. Final survey plan (after exporting the radioactive source)

- A map or drawing of the site, area or building which indicates the areas that will be included in the survey should be provided.
- The reference areas or material that will be used to determine the background conditions should be described, and a justification for their use should be provided.
- The procedures that will be used to perform the final survey should be described.
- The types of field instruments that will be used should be identified and the procedures for their use, calibration, and

operational checks, the measurement range and sensitivity for Co60 should be described.

- The laboratory analytical instruments for measuring samples should be identified and the procedures for the calibration, sensitivity and methodology for evaluation should be described. The procedure for demonstrating that the laboratory instruments have adequate sensitivity during their use should be described. The procedures for the collection, control and handling of the samples that will be analyzed in the laboratory should be described.
- The methodology for evaluating the survey results to ensure they are statistically correct and accurate should be described.
- Acceptable residual activity levels and their derivation should be given in written. The presentation of data in the final survey report should be described and the analytical procedures for comparing the results obtained with the acceptable residual activity levels should be provided. The records that will be maintained should be identified and the procedures for maintaining these records should be described.

11. Emergency plan; including Training in decommission safety and decommissioning drill.

The applicant should ensure the content of a basic emergency plan includes the following:

- Advice on when to implement the emergency plan.
- Prior training as necessary for workers who will be implementing the procedures.

- Description of, and information on, the availability of emergency response equipment.
- Technical data and data relevant to radiological protection for each situation.
- Identification of all persons and organizations who should be contacted as necessary at the various stages of the plan, as well as the relevant telephone numbers, fax numbers and email addresses.
- Reporting:

A report of an incident or an emergency should include the following:

- A description of the incident or emergency, with as much detail as possible of the specific equipment involved. The details should include model numbers and serial numbers wherever possible.
- Environmental conditions at the time of the incident or emergency, with particular reference to whether or not these conditions played any significant part in causing the emergency or incident or affecting the outcome.
- The specific cause of the incident or emergency.
- Details of actions taken to regain control of the situation and to restore conditions to normal, with special reference to any actions that were notably beneficial or detrimental.
- The training and experience of the personnel involved.
- An assessment and summary of the doses received by all affected persons.

- Recommendations made with the aim of preventing similar incidents and emergencies in the future and mitigating the consequences if a similar or related incident or emergency were to occur.

12. Waste Management

The radioactive waste generation due to radioactive sealed source decommissioning should be considered as the radiation incident. The separate authorization on the management of radioactive waste generated due to radioactive source decommissioning (if any) should be solicited from the NRRC.

All the possible radioactive waste streams that might be generated as a result of the decommissioning activities should be identified. The types of waste streams should be specified and include radioactive waste, hazardous waste, mixed waste, other types of non-hazardous waste, recyclable material and cleared material.

13.Related documents and files

Document Name	Document Type	Document Number	Relation to the guideline
Radiation Safety	Technical Regulation	NRRC-R-01	This Regulation set out the general safety requirements in ensuring protection of people and the environment against the harmful effects of ionizing radiation and for the safety of radiation sources.in addition, this regulation harmonize the requirements applicable in the Kingdom with the international best practices in order to achieve the highest standards of safety in activities and facilities that give rise to radiation risks
Notification on and Authorization of Facilities and Activities with Radiation Sources	Technical Regulation	NRRC-R-02	Prescribes the general requirements for notification on and authorization of activities, facilities and practices with radiation source, nuclear material and/or ore containing uranium and thorium in the Kingdom

Safe Transport of Radioactive Materials	Technical Regulation	NRRC-R-15	This regulation is to prescribe requirements that shall be fulfilled to ensure safety, security and to protect persons, property, and the environment from any harmful effects of radiation on the transport of radioactive materials or nuclear material.
Management of Radioactive Waste	Technical Regulation	NRRC-R-16	This regulation sets out the safety objectives, criteria and requirements for the protection of human health and the environment that shall be applied to the activities and the requirements that shall be met to ensure the safety of such activities and facilities.
Security of Radioactive Material	Technical Regulation	NRRC-R-17	This regulation that addressed security of radioactive material, associated activity, and associated facility against unauthorized removal of radioactive material and sabotage performed with the intent to cause harmful radiological consequences

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Nuclear and Radiological Regulatory Commission

Kingdom of Saudi Arabia

@saudinrrc
nrrc.gov.sa